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The Law and Economics of Repurchase Agreements: A Comparative Analysis

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a nonno Angelo, per sempre con me

a Nicola, Lucia, Malveno, per il loro affetto incondizionato

TABLE OF CONTENTS

CHAPTER II
THE LEGAL AND ECONOMIC STRUCTURE OF REPURCHASE AGREEMENTS

CHAPTER III
REGULATION AND PRACTICE OF REPURCHASE AGREEMENTS

ABSTRACT

Lo scopo del presente elaborato è quello di offrire un'analisi comparatistica degli aspetti legali ad economici dei *repurchase agreements*[1] (spesso abbreviati come "*repos"*) al fine di individuare il quadro regolamentare e le prassi applicative nel settore bancario e finanziario.

I *repo* possono essere definiti come un contratto in forza del quale una parte trasferisce un certo ammontare di titoli ad una controparte contro il pagamento di un determinato prezzo. Al contempo la parte si impegna a riacquistare dalla controparte lo stesso ammontare di titoli ad una scadenza convenuta, pagando un prezzo superiore a quello ricevuto per il primo trasferimento. Si tratta sostanzialmente di un'operazione finanziaria conclusa tra le medesime controparti a condizioni contrattuali predeterminate. I *repos* rappresentano una delle principali operazioni finanziarie volte a reperire liquidità e in quanto tali si prestano a molteplici utilizzi. Da un lato essi vengono abitualmente utilizzati da banche e intermediari finanziari nel mercato monetario, soprattutto come strumento di finanziamento nel breve termine. Dall'altro lato, essi vengono utilizzati dalle banche centrali come strumento di politica monetaria nelle operazioni di mercato aperto al fine di influire l'andamento della propria politica monetaria, in funzione di verifica e di adeguamento della liquidità del sistema e dei tassi di interesse.

Nonostante rivestano una posizione di primissimo piano nei mercati finanziari globali, i *repos* non sono stati oggetto di sufficiente attenzione da parte degli interpreti, soprattutto se confrontati con altre aree di ricerca della letteratura giuridico-finanziaria ed economico-finanziaria. Quasi assenti sono i contributi in chiave comparatistica, ad oggi quanto mai indispensabili per comprendere in maniera specifica le similitudini e le differenze caratterizzanti i quadri regolamentari transnazionali e la costruzione giuridica di tale fattispecie contrattuale nei molteplici ordinamenti in cui viene utilizzato. Il presente elaborato vuole offrire una ricerca preliminare per colmare tale vuoto, analizzando il tema dei *repo* attraverso le lenti della comparazione giuridica, illustrando

[1] *Repo* viene spesso indicato in italiano come "contratto di pronti contro termine". Tuttavia, chi scrive preferisce evitare la traduzione, in quanto storicamente i pronti contro termine utilizzati in Italia coincidono con un'operazione che in inglese è chiamata *buy/sell-back*, la quale si perfeziona con la conclusione di due separati contratti di vendita, uno a pronti e l'altro a termine, fra loro collegati da un vincolo economico. Il *repo* oggetto del presente elaborato, invece, è concluso con un unico contratto ed è la tipologia di gran lunga più diffusa nei mercati internazionali. Peraltro, lo schema internazionale è ormai ampiamente diffuso anche in Italia. Ulteriori differenze fra *repo* e *sell/buy back* saranno oggetto di analisi nel presente elaborato. Per una trattazione approfondita, si veda: M. Tola, *Pronti Contro Termine,* Milano, Giuffrè, 2013.

i fondamenti giuridici ed economici di tali strumenti finanziari. Nello specifico, oggetto di comparazione del presente elaborato sono l'ordinamento americano e quello europeo, i quali costituiscono nel complesso la quota più significativa del mercato globale dei *repos.* Come è risaputo, i sistemi giuridici europei ed anglosassoni condividono sia caratteristiche comuni sia differenze apparentemente insormontabili. Per questo motivo, individuare un approccio funzionale alla comparazione di tali sistemi giuridici non è compito semplice. Chi scrive ritiene che, per quanto riguarda il mercato dei *repos*, un singolo ordinamento non rappresenti un apprezzabile termine di comparazione in rapporto alle eccezionali dimensioni del mercato e alle sue interconnessioni nel sistema finanziario globale. D'altra parte, comparare ogni singolo ordinamento europeo, o quantomeno i principali, con l'esperienza americana richiederebbe un'imponente attività di ricerca e redazione che, per ragioni evidenti, sfugge alla tipologia e allo scopo del presente studio. Pertanto, per esigenze di chiarezza espositiva, il quadro europeo sarà analizzato in riferimento alla sua dimensione sovranazionale, costituita dalla normativa comunitaria applicabile, e in relazione al diritto inglese, abitualmente applicato alla maggior parte dei *repos*.

Il Capitolo I è strutturato in due sezioni. Nella prima sezione, si tentano di delineare le premesse normative sulla base delle quali applicare il metodo comparato allo studio della regolamentazione finanziaria, riflettendo sul ruolo del comparatista alla luce delle sfide transfrontaliere e dei *trends* globali. L'obiettivo di chi scrive è quello di individuare il corretto approccio metodologico all'analisi delle interconnessioni tra diritto e finanza (para. 1.1.). Inoltre, dopo aver chiarito la posizione rivestita dalla *soft law* nella costruzione delle regole del sistema finanziario globale (para. 1.2.), la prima sezione è dedicata al dibattito sull'applicazione "quantitativa" dei metodi di analisi comparativa per "misurare" l'evoluzione e la crescita dei mercati finanziari (para. 1.3.). Inoltre, in tale sezione si analizzano i presupposti e le ragioni fondamentali a sostegno della regolamentazione finanziaria (para. 1.4.). I risultati di tali premesse metodologiche hanno il pregio di facilitare la comprensione delle dinamiche economiche sottostanti alla regolamentazione globale dei *repos*. Inoltre, nella prima sezione vengono definiti alcuni concetti legali e finanziari ricorrenti durate la trattazione. La seconda sezione è propriamente dedicata all'analisi storica e istituzionale dei *repos.* In primo luogo, la trattazione affronta l'evoluzione della tipologia contrattuale alla luce dello sviluppo dei mercati cd. "all'ingrosso" (para. 1.5.) e al ruolo rivestito dai *repos* durante la crisi finanziaria globale del 2008 (para. 1.6.). L'analisi è poi dedicata alla qualificazione e

quantificazione del mercato intercontinentale di tali strumenti finanziari (para. 1.7.) Infine, il Capitolo I si prefigge lo scopo di discutere le istituzioni internazionali preposte alla elaborazione dei contratti standardizzati in materia, con specifico riferimento all'International Capital Market Association (para. 1.8.).

Il Capitolo II è dedicato alla struttura legale ed economica dei *repos.* Innanzitutto, si analizzano le differenze nella costruzione giuridica del contratto, rispettivamente strutturato come una vendita in Europa e come una concessione di pegno sul sottostante negli Stati Uniti (para. 2.1.). Dal momento che il *repo* è funzionalmente simile a un prestito garantito, la trattazione affronta anche il cd. "rischio di riqualificazione", ovvero il rischio che un giudice possa riqualificare un *repo*, che a tutti gli effetti comporta un trasferimento di proprietà dei titoli, come una concessione di un diritto reale di garanzia (para. 2.1.1.). Si esaminano poi le vicende del contratto in caso di mancato adempimento o insolvenza di una delle parti - soprattutto negli Stati Uniti - tracciando un'analisi costi-benefici riguardante il funzionamento economico di due previsioni legislative, segnatamente l'*automatic stay* e il *safe harbor*, applicabili ai *qualified financial conctracts*, di cui il *repo* è un esempio notevole (para. 2.2.). Successivamente, l'elaborato propone la tradizionale tassonomia della transazione, analizzando le tre principali strutture contrattuali con le quali si costruiscono i *repos*, ciascuna peculiare a specifiche esigenze commerciali delle parti (para. 2.3.). A tale fine, il Capitolo esamina il "*bilateral repo"* - in cui le controparti concludono la transazione senza alcun intermediario - (para. 2.3.1.), il "*tri-party repo*" - in cui alle controparti si interpone un intermediario, solitamente una banca, per facilitare l'operazione - (para. 2.3.2.) e infine il modello *hold-in-custody* - in cui il venditore mantiene il controllo funzionale sui titoli in un conto segregato - (para. 2.3.3.). Vengono poi trattate le due strutture con cui le parti possono regolare le garanzie sottostanti (*general collateral* o *special repos*), descrivendo in particolare le categorie di *assets* maggiormente utilizzati sul mercato a tal fine (para. 2.4.). Il capitolo prosegue con la trattazione del principale *master agreement* utilizzato nelle transazioni internazionali, il *Global Master Repurchase Agreement (GMRA)*, alla luce di un'analisi costi-benefici della standardizzazione dei contratti finanziari (para. 2.5.). Il Capitolo si conclude con alcune osservazioni sulle differenze fra *repos* e prestito di titoli (para. 2.6.) e sul trattamento contabile dell'operazione, facendo luce sul cd. "repo 105", un espediente contabile/finanziario utilizzato da Lehman Brothers durante l'ultima crisi finanziaria globale per allievare le criticità dei propri bilanci (para. 2.7.).

Il Capitolo III può essere diviso in due parti. Nella prima, si analizzano scopi, usi e funzionamento dei *repo* nel mercato europeo e in quello americano, facendo luce sulla tipologia dei soggetti attivi nel mercato monetario e sulle modalità con cui essi impiegano tale contratto (para. 3.1.). La prima parte inoltre esamina i principali rischi associati all'utilizzo dei *repo* - rischio di mercato, di credito, operazionale, di liquidità e sistemico - e i possibili fattori di attenuazione di tali rischi (para. 3.2.). A tale proposito, specifica attenzione viene dedicata al funzionamento delle "controparti centrali di compensazione". (para. 3.2.1). La trattazione poi affronta l'utilizzo dei *repo* come strumento di politica monetaria, sia da parte del Federal Reserve System americano sia da parte della Banca Centrale Europa, nelle operazioni di mercato aperto, attraverso le quali le banche centrali acquistano e/o vendono titoli presso gli operatori al fine di condurre la propria politica monetaria (3.3.). La seconda parte del capitolo, invece, è volta ad enucleare l'intrinseca tensione intercorrente fra le esigenze di regolazione del mercato e gli sforzi profusi dai regolatori nazionali e globali per garantire agli operatori finanziari di operare in modo agevole ed efficiente sul piano economico. A questo scopo, i *repo* vengono discussi alla luce del "*shadow banking*" (o "sistema bancario ombra"), analizzandone caratteristiche e criticità strutturali (para. 3.4.). Il presente elaborato si conclude con una rassegna delle principali disposizioni regolamentari e il loro impatto sui *repos,* sia in Europa (para. 3.5.) sia negli Stati Uniti (para. 3.6.).

INTRODUCTION

"It is well enough that people of the nation do not understand
our banking and monetary system, for if they did,
I believe there would be a revolution before tomorrow morning."

Henry Ford

The purpose of this survey is to provide a general overview of the legal and economic dimension of repurchase agreements (or "repos") in order to identify the main regulatory components and business key features of this market.

Repos can be defined as a sale of financial assets coupled with a promise to repurchase the same assets at a later date at a pre-specified price. Repos are one of the main sources of liquidity for the financial system. On the one hand, they are used in the money market with the primary aim of funding short-term positions or settling financing operations for banking and financial institutions. On the other hand, repos are routinely used by central banks as a monetary policy tool in open market operations in order to increase or decrease the aggregate money supply in the economy.

Despite being at the forefront of financial markets, repo has thus far received little attention in the legal literature compared to other financial activities. Legal scholars have barely exploited the comparative methods to better understand the common regulatory patterns and legal structures of repos across jurisdictions. Against this backdrop, aim of this dissertation is to apply comparative analyses to shed some more light on repurchase agreements, providing a better understanding of the legal and economic implications underlying repo markets. Specifically, this work seeks to provide a meaningful comparison of the legal frameworks for repos in the United States and in Europe, as these continental markets represent by far the largest portion of the global repo market. However, legal systems in European countries are characterized by common structural features and differences. As a result, finding a way to compare the European and American experiences is not an easy task. In our view, the law of a single country does not constitute in itself a useful subject of comparison due to the enormous size of the repo market and its interconnectedness to the global financial system. Moreover, comparing each single European jurisdiction (or at least the most relevant ones) with the US legal framework would require a research endeavor that goes beyond the scope of our analysis.

In view of this premise, the European repo experience will be highlighted with regard to its supranational provisions, including the relevant applicable EU law, and English law, the most commonly used governing jurisdiction of these transactions in Europe.

Chapter I is structured around two main pillars. In the first one, we provide a comparative approach to financial regulation, discussing how and to what extent comparative lawyers may investigate and analyze financial regulatory provisions and frameworks in view of contemporary global rule-setting trends and cross-border challenges. Our aim is to draw down a methodological framework addressing the intersection between law and finance (para. 1.1.). After having clarified the role played by soft law in the global financial system (para. 1.2.), the analysis will be devoted to shed some light upon the ongoing scholarly discussion on the quantitative aspects of comparative law measuring financial developments (para. 1.3.). The examination will then continue with a brief explanation of the rationale underlying financial regulation (para. 1.4.). The main findings of this analysis will be applied to rationalize the key-components of financial regulation relating to repos. The first section will also provide a basic taxonomy regarding legal and financial terms largely utilized in the repo market practice. The second section will offer some institutional context of repo contracts and agreements. In particular, we will analyze the wholesale funding's evolution in view of its historical context (para. 1.5.) and explain how repos have played a dramatic, yet essential, role in the last global financial crisis (para. 1.6.). We will then qualify and quantify the very elaborate contractual scheme of repos against the backdrop of the current cross-continental market scenario, providing some basic definitions (1.7.). We will finally identify the international actors involved in the drafting process of repo standardized contracts, particularly focusing on the International Capital Market Association (para. 1.8.).

Chapter II aims at offering an exhaustive description of the legal and economic structure of repo transactions. The analysis is firstly devoted to examining differences in the legal construct of repos between the two shores of the Atlantic. In particular, while in Europe repos are structured as true sales, in the United States the collateral is pledged but simultaneously exempted from certain bankruptcy provisions (para. 2.1.). As repos are substantially equivalent to secured loans, we will also address the so-called "recharacterization risk", which is the risk of a repo transaction being treated by courts

as something different from what the parties originally intended (para. 2.1.1.). Repos will be then examined against the backdrop of their treatment in the event of default (or insolvency) of the counterparty, especially under US law. Accordingly, we will explore functioning and purposes of automatic stays and safe harbors with regard to "Qualified Financial Contracts" ("QFCs") and outline a cost-benefit analysis of the relevant provisions (para. 2.2.). As repo agreements can be characterized by a number of different structures, each with their own peculiar features in order to suit specific customer requirements, it is of utmost importance to have a sense of the basic taxonomy adopted in repo transactions (para. 2.3.). Accordingly, we will examine bilateral repos - where buyer and seller trade directly - (para. 2.3.1.), tri-party repos - where a clearing bank intermediates between borrower and lender - (para. 2.3.2.) and hold-in-custody repos - where the seller retains operational control of securities on behalf of the buyer - (para. 2.3.3.). Further, the investigation will include a general overview of the main collateral structures available to parties (namely, the general collateral repo and "specials"), the many sources from which parties may draw the collateral and a survey of the current assets traded in the market (para. 2.4.). In addition, we will examine the most important master agreement adopted in international repo transactions, namely the ICMA's Global Master Repurchase Agreement (GMRA), particularly looking at a law & economics analysis of standardized financial agreements (para. 2.5.). Final remarks are dedicated to examining differences and similarities between repurchase agreements and securities lending (para. 2.6.) and to the accounting treatment of repos, shedding light upon the so-called "repo 105", a financial gimmick used by Lehman Brothers during the last global financial crisis to remove assets from its troubled balance sheets (para. 2.7.).

Chapter III could be divided in two parts. The first part investigates repo's purposes, uses and functioning in the United States and Europe, shedding light upon the number of participants in the money market and the ways they use repo transactions (para. 3.1.). We will then outline the main risks associated with repos (namely, market risk, credit risk, operational risk, liquidity risk and systemic risk) along with the risk-mitigants available to the parties (para. 3.2.). In this respect, particular attention is paid to the functioning of central clearing counterparties (CCPs) (para. 3.2.1). Thereafter, the analysis is devoted to scrutinizing the use of repos in central banks' open market operations - *i.e.* a central bank buying and selling government securities in the open market to expand or decrease the money supply in the system - with regard to the US Federal Reserve System and the European Central Bank (para. 3.3.). The second part of the chapter will be dedicated to

the inherent tension between the repo regulatory needs and the efforts national and global regulators are making to address the evolution of financial markets allowing, at the same time, market participants to operate in a cost-efficient way. Accordingly, we will explore the use of repurchase agreements in the so-called “shadow banking” system (para. 3.4.). Finally, the analysis will conclude with a survey of the main regulations impacting repos in the EU (para. 3.5.) and in the US (para. 3.6.).

CHAPTER I

COMPARATIVE LAW AND FINANCIAL (DE)REGULATION: THE CASE OF REPURCHASE AGREEMENTS

SECTION I. - 1.1. Comparative law and financial markets. - 1.2. Soft law in finance. - 1.3. (In)Formal rules as a tool to qualify and quantify financial developments. - 1.4. Regulating the financial system. - 1.4.1. Financial regulation through the lens of comparative lawyers. - SECTION II. - 1.5. The evolution of wholesale funding and the rise of repo markets. - 1.6. Repos and the financial crisis. - 1.7. Market size and the cross-continental scenario. - 1.8. Contract formation: who's who in the world.

SECTION I

1.1. *Comparative law and financial markets*[1]

Comparative law and financial law are well defined legal disciplines, with their own rules, mostly unaffiliated scholarly works and pre-identified fields of application. However, our aim is to scrutinize the economic and financial foundations of the repo's regulatory regime through a comparative legal analysis.

The rationale is to demonstrate that by using comparative law techniques it is possible (and even desirable) to lay the grounds for a sound understanding of the dynamics of financial markets to engage with the transnational change in the financial industry. Therefore, comparative law and financial regulation may benefit from each other, provided some systematic adjustments[2].

[1] The title refers to the proposed application of a specific legal discipline to the study of financial markets and regulation. It should not be confused with "comparative law and finance", which is instead a subcategory of Leximetrics, a field of research that measures quantitative differences resulting from the comparison of legal rules in different countries in order to test their efficiency. Incidentally, the latter methodology is going to be mentioned and analyzed in this chapter when arguing about financial developments.

[2] *See* A. Pizzolla, *Comparative Law and Financial Regulation: Methodological Remarks,* 3(2) Irish Journal of Legal Studies, 2013, 118 ff.

What makes the comparative methodology the most attractive to this purpose is its inherent distance from the formalistic approach to the law that generally encompasses scholarly research on financial markets. In the broader sense, to compare means to observe and explain similarities as well as differences depending on the purpose of the undertaking at hand[3], which in this case is finding what is good and what is improvable in the legislative provisions and markets efforts aimed at harmonizing the rules applicable to the global financial system. In addition, comparative law may be the missing survey technique we need to apply to the financial world to tackle structural regulatory gaps by identifying policy options and, if required, proposing solutions already experimented in other legal systems, or even combining existing alternatives to convey the best responses[4].

A preliminary contribution that comparative law can make to the scholarship of financial law and regulation, in order to clarify its position in the modern social order, is the reinterpretation of finance through the lens of legal formants[5]. The theory behind legal formants, which is deeply rooted in comparative law, focuses on the law as a social activity: a formant can therefore be summarized as the legal or non-legal basis on which a given legal order (or legal tool) develops[6]. The theory of legal formants is based upon the analysis of different formative elements and "layers", both inside and outside the legal domain, which are viewed and understood as the result of competing transplants and sources[7]. For instance, in Western legal systems formants not only consist of concepts and assertions about the law developed by legislators, judges or scholars, but they can also constitute provisions arising out from political, philosophical or economic propositions[8]. To this extent, the comparative study of law can be helpful not only in promoting consistency where needed, but it also can serve as a "*selective adoption of particular legal institutions or rules"*[9].

Based on these considerations, financial rules should be deconstructed in order to propose a meaningful economic analysis of legal tools and institutions[10]. Within this

[3] R. B. Schlesinger, H. W. Baade, P. E. Herzog, E. M. Wise, *Comparative Law. Cases, Text, Materials,* New York, Foundation Press, 1998, 37.
[4] R. B. Schlesinger, H. W. Baade, P. E. Herzog, E. M. Wise, *Comparative Law. Cases, Text, Materials,* 37.
[5] The approach based on legal formants was mainly developed by Rodolfo Sacco. It is known as *the dynamic approach to comparative law*, *see* R. Sacco, *Legal Formants: A Dynamic Approach to Comparative Law*, 39(1) The American Journal of Comparative Law, 1991, 1 ff.; *also see* R. Sacco, P. Rossi, *Introduzione al Diritto Comparato,* Turin, Utet Giuridica, 2015, 55ff.
[6] P. G. Monateri, *Legal Formants and Competitive Models: Understanding Comparative Law from Legal Process to Critique in Cross-System Legal Analysis,* 2008, 2, available at https://ssrn.com/abstract=1317302.
[7] R. Sacco, P. Rossi, *Introduzione al Diritto Comparato,* 55.
[8] R. Sacco, *Legal Formants: A Dynamic Approach to Comparative Law,* 32.
[9] R. Sacco, *Legal Formants: A Dynamic Approach to Comparative Law,* 3.
[10] P. G. Monateri, *Legal Formants and Competitive Models: Understanding Comparative Law from Legal Process to Critique in Cross-System Legal Analysis*, 5.

perspective, there may be rules that have little or no authority according to the official sources of law and nevertheless are respected and proved to be effective in setting standards because of the pervasive presence of formal and informal layers in finance[11]. More specifically, the law, or even the absence of binding legal rules in the field, has played a pivotal role in the development of the financial system. However, the lack of legislative interventions, whether by chance or on purpose, does not amount to a void of "law", because every social environment, included the one gathered around the financial community, builds its coexistence on (formal and informal) legal rules[12].

Against this backdrop, a complex informal system of (de)regulation has been adopted by the markets and its actors and has been sometimes externalized by the enactment of more or less formal documents, containing best practices, recommendations and standard rules, or sometimes has just settled through mere acquiescence[13]. In this regard, financial markets, and the underlying assets exchanged within them, are the meeting venue of different rules and rules makers, both private and public, who together contribute to the state of the art on market practices. To this extent, repurchase agreements and the relevant regulatory implications constitute a fitting case study to measure the contribution that numerous formants give to the construction of financial products (*e.g.* swaps, future, options) and to the implementation of regulatory policies in the arena of international finance.

In addition, one of the core teachings of the comparative law scholarship is that *common law* and *civil law* traditions are not impenetrable to each other[14]. Conversely, they are dynamic frameworks of a pluralistic world where no system is self-contained[15]. Against this backdrop, global convergence and unification of legal systems has been happening for a long time[16]. Namely, as the law of finance has evolved to a global scale[17],

[11] This approach is drawn and readapted from M. Bussani, M. Infantino, *Tort Law and Legal Cultures*, 63 The American Journal of Comparative Law, 2015, 83.
[12] *See* M. Bussani, *Il Diritto dell'Occidente. Geopolitica delle Regole Globali,* Turin, Einaudi, 2010, 74 ff.
[13] M. Bussani, *Il Diritto dell'Occidente. Geopolitica delle Regole Globali,* 75.
[14] U. Mattei, *Il modello di common law,* Turin, G. Giappichelli Editore, 2014, 88.
[15] U. Mattei, *Il modello di common law*, 88. The author especially refers to the UK common law tradition, because it has been primarily affected by the *Europeanisation* of its rules in almost all legal domains.
[16] P. De Cruz, *A Modern Approach to Comparative Law,* Deventer, Kluwer Law and Taxation Publishers, 1993, 339-340. The three main strategies of convergence have been explained by J. H. Merryman: (i) *programs for the unification of law*, *e.g.* the International Institute for the Unification of Private Law - UNIDROIT in Rome; (ii) *legal transplants*, *i.e.* the moving of rule from one country to another, which are the most common form of legal change; (iii) *natural convergence*, *i.e.* when legal systems of societies will tend to become more alike as the societies themselves become more like each other.
[17] How actually are financial markets globalized? Measuring their interconnection is not an easy task but, according to H. Scott, there appears to be four main approaches: (i) the correlation of prices between markets: the higher the correlation in rate of returns on similar assets across countries, the more integrated the markets; (ii) "quantity approaches", such as focusing on portfolio diversification in order to understand the behavior of investors; (iii) the link between savings and investment levels within countries: if investors

comparatists need to rethink their role in providing a relevant academic contribution in this field[18]. Traditional categorizations based on legal origins (or legal families) are in fact not capable of capturing modern trends such as cross-border listings, international stock exchanges or international banking regulations[19]. For instance, financial regulation itself is detached from the dichotomy between civil law and common law families and it is not entirely settled in either of the two legal systems[20].

The comparative perspective would therefore need to adopt a methodological approach allowing scholars to disentangle both the geographical boundaries between different legal systems (*e.g.* national and regional) and the regulatory perimeters of traditional legal fields (*e.g.* commercial and regulatory law)[21]. In particular, as the impact of globalization is especially relevant in the field of capital markets law, the classical distinction between common law and civil law is not material as international finance does not establish itself in national legal systems, but rather develops as a transnational phenomenon[22]. Finding the right path to compare the diversity of national legal systems is of practical relevance: the elimination of differences facilitates international transactions, increases the general welfare and leads to international understanding[23]. In this regard, bankers and economists across the world already understand each other because they speak the same, standardized language, while generally lawyers who come from different backgrounds have to face challenges associated with a situation of "*cultural parochialism"*[24]. Certainly, this is not completely true when it comes to the domain of *law and finance*, as similar economic rationales are deemed to apply to legal provisions affecting the regulation of financial markets across jurisdictions. Indeed,

diversify internationally, these rates should become less closely related to each other; (iv) constructing indices of openness to understand formal barriers to trade in financial assets, *see* H. Scott*, International Finance. Transactions, Policy and Regulation,* New York, Foundation Press, 2005.

[18] *See* M. Siems, *The End of Comparative Law,* 2 The Journal of Comparative Law, 2007, 133 ff. In this very provocative paper the author reflects on the methodology of comparative law and highlights four trends which show a pessimistic view on the future of the subject: (i) the disregard of comparative law by courts, especially in the US; (ii) the complexity of serious comparative work; (iii) the so-called "simplistic approach", *i.e.* accurate but mere descriptions of a particular legal system by domestic scholars, which is not really comparative law; (iv) the irrelevance of comparative law because of harmonization and convergence of national systems and because of the evolving legal framework, which has shifted from a state-based law to a complex network of transnational norms.

[19] M. Siems, S. Deakin, *Comparative Law and Finance: Past, Present and Future Research,* 166 Journal of Institutional and Theoretical Economics, 2010, 127.

[20] A. Pizzolla, *Comparative Law and Financial Regulation: Methodological Remarks*, 130.

[21] F. Ortino, M. Ortino, *Law of the Global Economy: in Need for a New Methodological Approach?,* in C. B. Picker, I. D. Bunn, D. W. Arner (eds.), *International Economic Law. The State and Future of the Discipline,* Oxford, Hart Publishing, 2008, 89.

[22] F. Ortino, M. Ortino, *Law of the Global Economy: in Need for a New Methodological Approach?,* 89.

[23] J. H. Merryman, *The Loneliness of the Comparative Lawyer. And Other Essays in Foreign and Comparative Law,* The Hague, Kluwer Law International, 1999, 23.

[24] U. Mattei, *Comparative Law and Economics,* Ann Arbor, The University of Michigan Press, 1997, 77-78.

regulators should therefore be able to convey uniform responses to the challenges that they have to face[25].

Besides, the internationalization of finance and the globalization of rules bring debate on their costs and benefits. As argued by H. Scott, some benefits are:

(i) access to worldwide capital markets may allow countries to smooth their financial needs, by borrowing or lending depending on their economic conditions;

(ii) international markets can promote domestic growth by allowing countries to import capital;

(iii) globalization may enhance macroeconomic discipline (*i.e.* capital flows policing bad government behaviors);

(iv) internationalization may discipline regulators, constraining excessive domestic regulation;

(v) globalization may increase competition and lead to more efficient banking systems or cheaper securities offerings[26].

At the same time, professor H. Scott also highlights some potential costs:

(i) poorly performing markets may fail to attract capital, leading to capital outflows or unemployment;

(ii) the volatility of capital flows can quickly destabilize an economy;

(iii) the entry of foreign institutions may lead to the demise of local ones;

(iv) the integration of financial systems can result in quick transmission of economic shocks between world economies[27].

In spite of any methodological debate, comparative lawyers can give enormous contributions to the outcome of this cost-benefit analysis, as they should be able to draw solutions by comparing different legal experiences across the world. Globalization of financial markets does not limit the scope of comparative legal studies. Rather, it is likely to broaden this analysis, carrying out a review of traditional approaches in order to move from a nationally focused survey to the inclusion of multidimensional frameworks[28]. As a matter of fact, there has been and will be more convergence of Anglo-Saxon and Continental European countries in the field of financial law and regulation as globalization will inevitably bring more international competition. As a result, we agree

[25] Although regulators are mostly economists, lawyers and legal academics would have a better grasp than many financial experts of the "stickiness" of financial institutions, see K. Anderson, *Do Lawyers and Law Professors have any Comparative Advantages in Opining on Financial Regulation Reform?*, 6 American University Washington College of Law Business Law Brief, 2010, 11.
[26] H. Scott, *International Finance. Transactions, Policy and Regulation,* 13-14.
[27] H. Scott, *International Finance. Transactions, Policy and Regulation,* 13-14.
[28] A. Pizzolla, *Comparative Law and Financial Regulation: Methodological Remarks*, 137.

that more harmonization of legal and economic practice is the answer comparative lawyers need to comment further to solve regulatory challenges[29].

1.2. *Soft law in finance*

As anticipated above, the global financial system can be seen as a construction of formal and informal rules, in which both soft law and hard law compete in defining its boundaries. According to the Black's Law Dictionary, soft law refers to *"rules that are neither strictly binding nor completely lacking in legal significance",* in contrast to the concept of hard law which refers to actual binding legal instruments and laws (*e.g.* treaties, statues, codes, etc.)[30]. In particular, with regard to international law, soft law can be understood as a set of "*guidelines, policy declarations, or codes of conduct that set standards of conducts but are not legally binding"*, and therefore not directly enforceable[31]. Soft law has become a pervasive element in the legal architecture of financial markets since global rules and standards are often promulgated by regulatory agencies and international institutions in the form of non-binding agreements[32]. Instead, hard law instruments play a limited role in financial regulation at international level, as by definition international financial law lacks the legal obligation and formality of hard law instruments[33]. Our global economy reflects the decentralization of international financial law, even though hegemons states continue to control financial rules within their borders[34]. Above this layer of political influence, rule makers share information, engage in international agreements and forge policy through cooperation and compromise[35].

Against this backdrop, market participants are incentivized to comply with this informal legal layer which now constitutes expression of the international economic order. Together, nation-states, national regulators and private market participants have developed an array of mostly informal, soft law global networks with the aim of

[29] K. J. Hopt, *Common Principles of Corporate Governance in Europe?* in B. Markesinis (ed.) *The Clifford Chance Millennium Lectures. The Coming Together of the Common Law and the Civil Law,* Oxford, Hart Publishing, 2000, 131.
[30] *See* B. Garner (ed.), *Black's Law Dictionary,* St. Paul, West Publishing Co., 2014.
[31] B. Garner (ed.), *Black's Law Dictionary.*
[32] C. Brummer, *Soft Law and the Global Financial System. Rule Making in the 21st Century,* New York, Cambridge University Press, 2015, 3.
[33] C. Brummer, *Soft Law and the Global Financial System. Rule Making in the 21st Century,* 3.
[34] *See* C. Brummer, *Soft Law and the Global Financial System. Rule Making in the 21st Century,* 46 ff.
[35] *See* M. Barr, *Who's in Charge of Global Finance?,* 45(4) Georgetown Journal of International Law, 2014, 971 ff.

developing common cross-border rules, both at a formal and informal level[36]. The *rise of the networks* ranged from private bodies, such as the International Swaps and Derivatives Association (ISDA) and the International Capital Market Association (ICMA), to more procedurally complex institutions, such as the Basel Committee on Banking Supervision (BCBS)[37]. Altogether, they still reflect the dominant role of national authorities in shaping financial rulemaking, while at the same time allowing an informal development of common regulatory approaches on a transnational basis[38].

Although there are many ways in which soft law manifests itself in international financial law, professor C. Brummer[39] groups them in three basic categories:

(i) *best practices* that promote regulatory supervision through general guidelines (for instance, those concerning capital adequacy and optimal disclosure rules). These practices are promulgated by regional bodies or private actors under the auspices of national authorities. Some examples can be found by looking at key regulatory core principles emanating from international standard setting bodies, such as the International Organization of Securities Commissions (IOSCO) with regard to securities regulations and most importantly the Basel Committee on Banking Supervision with regard to the banking sector. The normative weight of best practices reflects the resilience of minimum shared standards within a sound financial regulatory system, as they also provide functional rules that can be flexibly implemented to allow countries to take their local needs into thoughtful consideration;

(ii) *regulatory reports and observations* that create official records of facts, helping establish basis for policymaking and offering overviews of financial data and their implications on the economy. Reports are useful in affecting governance as they establish tacit commitments by national authorities. For instance, many reports offered

[36] M. Barr, *Who's in Charge of Global Finance?*, 980.
[37] M. Barr, *Who's in Charge of Global Finance?*, 980.
[38] M. Barr, *Who's in Charge of Global Finance?*, 980-988. Overall, these networks are hybrid bodies that assemble many participants, such as central banks, securities and insurance regulators. They are soft law bodies as that they lack legal personality, issuing largely non-binding standards and most importantly permitting variations in the implementation process across jurisdictions. However, a big concern relates to their accountability and legitimacy. They are criticized, among other things, for unresponsiveness to domestic constituencies, lack of transparency and limited membership that excludes less developed nations. The responses to improve accountability have not yet been very effective. For a detailed explanation of the accountability and legitimacy problem, *see* M. Barr, G. Miller, *Global Administrative Law: the View from Basel,* 17(1) The European Journal of International Law, 2006, 15 ff. For a thorough overview of the challenges posed by the implementation of soft law-networked governance, *see* E. Helleiner, *Regulating the Regulators. The Emergence and Limits of the Transnational Financial Order*, in T. Halliday, G. Shaffer (eds), *Transnational Legal Orders* New York, Cambridge University Press, 2015, 231 ff.
[39] C. Brummer, *Why Soft Law Dominates International Finance-and not Trade,* in T. Cottier, J. Jackson, R. Lastra (eds.), *International Law in Financial Regulation and Monetary Affairs,* Oxford, Oxford University Press, 2012, 99 ff.

retrospectively some analysis to identify the causes of the last financial crisis, trying to address future challenges;

(iii) *information-sharing and enforcement cooperation,* usually in the form of memoranda of understanding between authorities. The need for quality information in order to assess risks and enhance their prudential oversight pushes national regulators to enter into information-sharing agreements[40].

That being said, one may wonder why soft law is dominant in both financial law and regulation. A first explanation is drawn from the so called "contractarian analysis", developed on the law and economics of contracts[41], which rationalizes soft law as a risk-mitigation device[42]. Against this backdrop, adopting soft law as a contracting device allows actions to be taken quickly and efficiently, also permitting new regulatory experimentations, while hard law instead requires time and international efforts to be enforced[43]. Moreover, soft law entails fewer sovereign costs as agreements having soft law informal nature would allow regulators to flexibly adopt only certain normative components, especially if later circumstances suggest that compliance would not fit their interests[44]. A second explanation for soft law's dominance lays on "soft power" theories, which characterize soft law as a force in its own right, meaning that policies are adopted by way of persuasion[45]. Accordingly, regulators and policymakers take advantage of their influence to shape collective goals, making norms that discipline collective behaviors through the strength of reputational tools. In order for this system to work effectively, coordination is needed, and this can only be reached by identifying common standards to avoid information asymmetries[46]. Against this backdrop, prudential regulation and supervision of financial markets require ever-evolving adaptations as markets themselves

[40] The three categories are drawn from C. Brummer, *Why Soft Law Dominates International Finance-and not Trade,* 99 ff.
[41] The contractarian approach was developed by international law scholars Kenneth Abbott and Duncan Snidal, and later by Charles Lipton, drawing on law and economics frameworks in order to compare the cost and benefits of soft law and hard law, by making analogies between the making of international agreements and the traditional making of privately negotiated contracts. In other words, the results are drawn from a comparative analysis between the objectives that parties predetermine when contracting and the objectives that countries have when considering the appropriate formalities to adopt in international agreements, *see* C. Brummer, *Soft Law and the Global Financial System. Rule Making in the 21st Century,* 129.
[42] C. Brummer, *Soft Law and the Global Financial System. Rule Making in the 21st Century,* 129.
[43] C. Brummer, *Soft Law and the Global Financial System. Rule Making in the 21st Century,* 129.
[44] C. Brummer, *Soft Law and the Global Financial System. Rule Making in the 21st Century,* 129-130.
[45] C. Brummer, *Soft Law and the Global Financial System. Rule Making in the 21st Century,* 132-133.
[46] C. Brummer, *Soft Law and the Global Financial System. Rule Making in the 21st Century,* 132.

evolve. The case of the wholesale funding industry during the last financial crisis is striking in this respect[47].

1.3. *(In)Formal rules as a tool to qualify and quantify financial developments*

The coexistence of formal and informal rules, as we have seen, is a contingent feature of financial markets. After clarifying that the civil law/common law dichotomy is not pertinent when tackling the relationship between comparative law and globalization of financial markets, it is worth noting how and to what extent legal origins have been actually used as a tool to measure developments of economic and financial relevance.

To this end, some scholars from Harvard University and Chicago University - namely, R. La Porta, F. Lopez-de-Silanes, A. Schleifer, R. W. Vishny - proposed an influential line of research, providing a methodology for empirically assessing how the laws and the quality of legal rules of different countries may protect certain legal interests[48]. The relative results may then be utilized to assess which legal institutions are better able to ensure the growth of financial markets[49]. This approach has been defined as "*comparative law and finance"*, which represents a subcategory of "Leximetrics", a field of research that ranks each type of law in a given field by assigning a numerical value to it in order to assess strengths and weaknesses, which also includes *numerical comparative law*, *statistical comparative law* and *law and finance*[50]. In other words, we can think of Leximetrics as a comprehensive legal tool to define quantitative measurements of law in order to compare legal rules in different countries or to categorize laws across time in the same country.

The following diagram provides a visual snapshot of this categorization.

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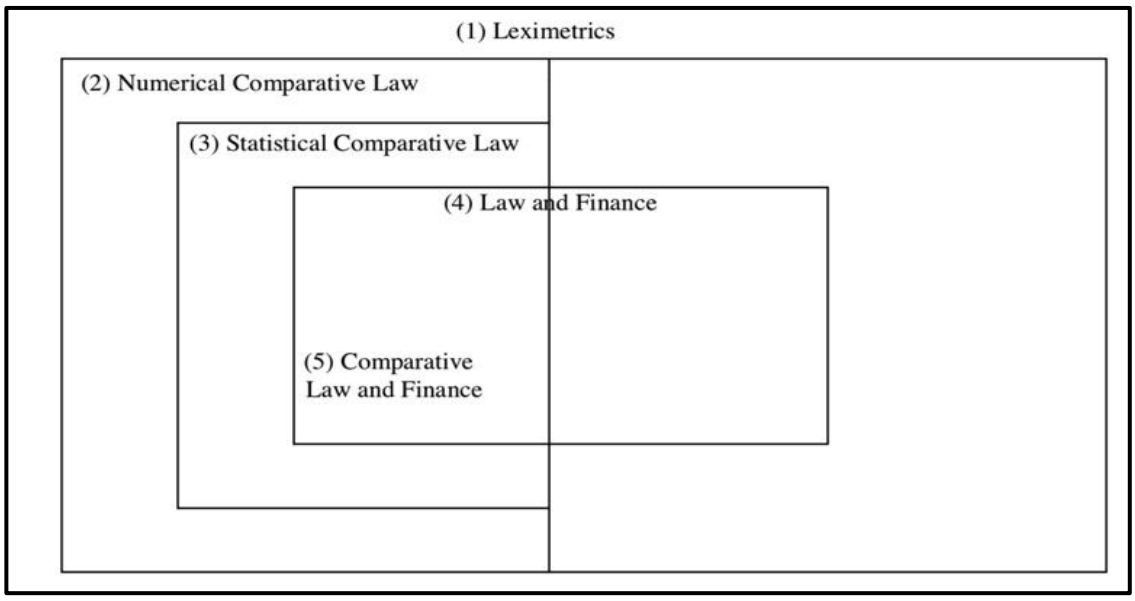
[47] *See* E. Ferran, K. Alexander, *Can Soft Law Bodies Be Effective? Soft Systemic Risk Oversight Bodies and the Special Case of the European Systemic Risk Board,* University of Cambridge Legal Studies Research Paper No. 36, 2011.

[48] *See* R. La Porta, F. Lopez-de-Silanes, A. Schleifer, R. W. Vishny, *Law and Finance,* National Bureau of Economic Research Working Paper No. 5661, 1996. The article has been very influential, not only among academics, to such an extent that it affected real policy issues. For instance, the World Bank relied heavily on the indices projected by La Porta in order to develop its *Doing Business* reports, which aim at providing measures of business regulations in 190 countries and selected cities around the world, *see* http://www.doingbusiness.org. The original work of La Porta and his colleagues only covered the protection of corporate shareholders and creditors, the origins of the applicable rules and the quality of their enforcement in 49 countries. Later on, the same authors extended their analysis to other domains, such as regulations for starting a business, labour regulations, dispute resolution mechanisms and securities laws.

[49] M. Siems, S. Deakin, *Comparative Law and Finance: Past, Present and Future Research*, 122.

[50] M. Siems, S. Deakin, *Comparative Law and Finance: Past, Present and Future Research,* 123.

Leximetrics:[51]



The scholarship of La Porta and the other scholars, in a broader sense, also belongs to the field of *numerical comparative law,* which encompasses all quantitative comparative methodologies that employ legal data[52]. More precisely, numerical comparative law can refer to two things:

(i) the analysis which establishes a causal link between the law and other variables;

(ii) the so-called "simple counts", for instance those of court decisions across different jurisdictions[53].

La Porta's research can be also understood as a subcategory of *statistical comparative law,* which is not necessarily related to the field of *law and finance,* the latter not always being comparative in nature. Overall, this analytical approach to the law eventually overlaps the areas of statistical comparative law and law and finance and may be framed as *comparative law and finance.* The starting point of *comparative law and finance* was the recognition that commercial laws in different countries are the result of (sometimes involuntarily) legal transplantations from two legal systems: common law and civil law, the latter being scrutinized through the lens of the French, German and Scandinavian experiences[54]. The result of this approach was at the time quite striking as

[51] The image is drawn from M. Siems, S. Deakin, *Comparative Law and Finance: Past, Present and Future Research,* 124.
[52] M. Siems, S. Deakin, *Comparative Law and Finance: Past, Present and Future Research,* 125.
[53] M. Siems, S. Deakin, *Comparative Law and Finance: Past, Present and Future Research,* 124.
[54] R. La Porta, F. Lopez-de-Silanes, A. Schleifer, R. W. Vishny, *Law and Finance*, 4. For a thorough overview of legal transplants, *see* A. Watson, *Legal Transplants. An Approach to Comparative Law,* Charlottesville, University Press of Virginia, 1974.

it showed that legal rules regarding investor protection which originate in common law countries tend to perform better than laws that originate from the French civil law traditions[55]. German and Scandinavian laws fell between the two[56]. The methodology used to foster this research was later criticized as it fails to provide an accurate numerical description of the legal systems analyzed, while numerous methodological errors were also identified[57]. Emphasizing on the accuracy of data, a more recent publication has provided a substantial revision of the previous findings: with more accurate data, the results from La Porta and his colleagues are no longer material and differences in values are not significantly distributed across common law and civil law traditions[58]. Overall, these scholars have the merit of having started a comparative research on the relationship between a country's legal institutions and its financial system[59], even though doubts have been casted on their approach, especially from a comparative legal standpoint[60].

As a result, a new project on "Law, Finance and Development" based at the Centre for Business Research of the University of Cambridge proposed a new approach to review the way legal institutions may influence financial systems and affect economic development[61]. The following methodological adjustments were implemented:

(i) the construction of new longitudinal indices which shall take into account not only positive legal rules, but also self-regulatory codes and other normative sources with binding effect, as well cataloguing legal rules as they have evolved over time, in order to capture both the *formal* and *informal* evolution of laws;

(ii) the differences between legal systems are not only determined by aggregation of all variables, but also through the calculation of differences between each variable in the law of a particular legal system and the same variable in the law of other countries: the absolute values of these differences are then added together;

[55] R. La Porta, F. Lopez-de-Silanes, A. Schleifer, R. W. Vishny, *Law and Finance*, 40 ff.
[56] As for German civil law and Scandinavian countries, they performed even better than common law traditions with regard to the quality of law enforcement.
[57] M. Siems, *The End of Comparative Law,* 2 Journal of Comparative Law, 2007,147.
[58] *See* H. Spamann, *Law and Finance Revisited,* The Harvard John M. Olin Fellow's Discussion Paper Series No. 12, 2008, available at http://www.law.harvard.edu/programs/olin_center/fellows_papers/pdf/Spamann_12.pdf.
[59] For an application of the comparative perspective to pure economics in order to measure the quality of good institutions, *e.g.* those that can secure property rights, *see* A. Schleifer, E. Glaeser, R. La Porta, F. Lopez-de-Silanes, S. Djankov, *The New Comparative Economics,* Harvard Institute of Economic Research Discussion Paper No. 2002, 2003.
[60] M. Siems, S. Deakin, *Comparative Law and Finance: Past, Present and Future Research,* 126.
[61] *See* M. Siems, S. Deakin, *Comparative Law and Finance: Past, Present and Future Research,* 131.

(iii) a better claim on the "comparative law and finance" approach by which the quality of the law is reflected in a country's financial development, based on the insight that legal rules are endogenous to the economic and political context[62].

Another major critique to the original approach to *comparative law and finance* was made by H. Rosenthal and E. Voeten, upon the premises that most of the times legal scholars collect indicators of a country's regulatory or legal characteristics and then combine these into indices that measure the theoretical concepts of interest, which can be related to upstream variables (*e.g.* legal origins) or downstream variables (*e.g.* performance of the legal system or economic outcomes)[63]. Based on this assumption, the authors advance two different claims to strengthen the results of La Porta:

(i) the use of statistical measurements has greater validity than the construction of indices as it is more strongly related to legal origins and can better predict outcomes than the scale constructed with the same data;

(ii) an advantage of measurement models over ad-hoc index construction is that it provides researchers with a vehicle to analyze various components of an index, generating important knowledge for comparative scholars who are examining the extent to which individual aspects of legal and political systems contribute to financial development[64].

Nevertheless, we have to acknowledge that all the above examples of analytical approach to legal rules still take into account to some extent the dichotomy between civil and common laws. Instead, in order to determine which legal regimes would better support economic growth and market development, the analysis, as for the case of globalization and the law, requires one step further this traditional dichotomy[65]. The relevance of legal origins for financial developments is controversial, as other aspects of a society, such as politics, culture, religion and geographical institutions are similarly important for such developments[66]. Of course, this does not imply that different legal origins do not have any effect on the measurement of the relation between legal heritage and financial prosperity. However, more effective criteria for a differentiation are to be

[62] M. Siems, S. Deakin, *Comparative Law and Finance: Past, Present and Future Research,* 132-133.
[63] *See* H. Rosenthal, E. Voeten, *Measuring Legal Systems*, 2nd Annual Conference on Empirical Legal Studies Paper, 2007.
[64] *See* H. Rosenthal, E. Voeten, *Measuring Legal Systems*, 16-17.
[65] G. Hadfield, *The Levers of Legal Design: Institutional Determinants of the Quality of Law,* University of South California Center in Law, Economics and Organization Research Paper No. C07-8, 2007, 27. The analysis in the paper suggests that the important distinctions between legal regimes are not based on the reliance on code versus case law, but rather in the institutional determinants of judicial incentives and the capacity for a legal regime to generate investments in legal human capital, which may reduce legal error.
[66] M. Siems, *Legal Origins: Reconciling Law & Finance and Comparative Law*, 52(1) McGill Law Journal, 2007, 62.

found. To this end, following on from the research of professor M. Siems, to build-up a better methodology, we would need to analyze the following key issues:

(i) whether a country experienced European colonization (with the advantage that this approach does not only look at legal transplantations that may have been only superficial or temporary);

(ii) the country's language, as it is a crucial determinant of how ideas may freely move from one country to the others;

(iii) the relative importance of the juxtaposition of statutory law and case law, as today statutory law and case law coexist in all countries;

(iv) formality and flexibility in a given legal system because, as opposed to the traditional distinction which regards statutory law as rigid and case law as flexible, statutory law can be flexible and case law rigid[67].

Overall, comparative law has been increasingly pursued in a numerical way, although comparing legal differences using quantitative analysis does not belong to the traditional approach[68]. This could have some potential in increasing the practical value of comparative law, as long as there is the consciousness of the limits of this approach[69].

1.4. *Regulating the financial system*

The financial system needs to be regulated for a variety of reasons. The main goal of financial regulation is to improve the functioning of the financial system, in order to

[67] M. Siems, *Legal Origins: Reconciling Law and Finance and Comparative Law,* 72.
[68] M. Siems, *Numerical Comparative Law: Do We Need Statistical Evidence in Law in Order to Reduce Complexity?,* 13 Cardozo Journal of International and Comparative Law, 2005, 538.
[69] For a general discussion of the need for comparative law to explore the utility of quantitative methods, *see* J. Reitz, *Legal Origins, Comparative Law and Political Economy,* 57 The American Journal of Comparative Law, 2009, 847 ff.; *Also see* M. Siems, *Numerical Comparative Law: Do We Need Statistical Evidence in Law in Order to Reduce Complexity?,* 539-540. As for the limits of the numerical approach, Professor M. Siems suggests some guidelines in using numerical comparative law: (i) *necessity:* traditional comparative law presents difficulties when a lot of countries or a lot of legal provisions have to be compared, so that a new approach is indispensable to deal with all the information; (ii) *methodical awareness*: statistics may be slippery and the results may be less clear than they appear; (iii) *transparency:* data have to be collected clearly and figures have to be explained to understand exactly what they mean; (iv) *comparability:* comparing legal rules through numbers is only valuable if there are not manifested social, economic or cultural differences that may influence the outcomes; (v) *functional equivalents:* the inclusion of measures that contain functional equivalents in the indices should be attempted, in order for the indices to be understood by other scholars who belong to different legal tradition; (vi) *reflections:* one must first consider which conclusions can be drawn from the statistics, since the numerical approach may also be used merely as the starting point of other areas of research, *e.g.* to look at other social, cultural and economic circumstances surrounding legal rules.

determine the best legal and regulatory framework required to correct the failures of the system and to promote financial stability[70]. In addition, there is a compelling need to reduce negative externalities to the economy arising out from system risk and contagion[71]. This of course poses many challenges in shaping the right approach to financial regulation and its policy and to the role that can be played by comparative law and its potential in filling the regulatory gaps of the system. There is no clear understanding on which regulatory approach is better to address systemic risk and contagion. However, historically, geopolitical forces[72] have been pivotal in building up regulatory approaches[73]. Therefore, comparing different jurisdictional experiences may be helpful to understand how regulation has evolved in the past and where it is heading in the future[74].

[70] J. Armour, D. Awrey, P. Davies, L. Enriques, J. N. Gordon, C. Mayer, J. Paine, *Principles of Financial Regulation,* Oxford, Oxford University Press, 2016, 51. *Also* see A. M. Pacces, H. Nabilou*, The Law and Economics of Shadow Banking,* in I. H-Y. Chiu, I. G. MacNeil (eds.)*, Research Handbook on Shadow Banking. Legal and Regulatory Aspects,* Cheltenham, Edward Elgar Publishing, 2018, 7.

[71] R. J. Herring, A. M. Santomero, *What is Optimal Financial Regulation?* in B. E. Gup (ed.) *The New Financial Architecture. Banking Regulation in the 21st Century,* Westport, Quorum Books, 2000, 51. Systemic risk may be defined as "*the risk of a sudden, unanticipated event that would damage the financial system to such an extent that economic activity in the wider economy would suffer".* Such shocks may originate inside or outside the financial sector and may include, for instance, sudden failure of major participants in the financial system or a technological breakdown of settlements and payment systems. *See also* R. J. Philipps, R. D. Johnson, *Regulating International Banking: Rationale, History and Future Prospects* in B. E. Gup (ed.) *The New Financial Architecture. Banking Regulation in the 21st Century,* Westport, Quorum Books, 2000, 16, where it is argued that there are three approaches to international banking regulation: (i) a move toward greater reliance on market system discipline; (ii) the establishment of a supranational regulatory agency; (iii) a combination between of reliance of market discipline, an expandable role for bank's internal controls and international supervisory cooperation. According to the authors, the latter appears to be the preferred approach to address future challenges.

[72] C. Jordan, *International Capital Markets: Law and Institutions,* Oxford, Oxford University Press, 2014, 13. There are three major geopolitical factors that shaped the evolution of regulatory approaches. First, the nineteenth-century British empire spread its financial models around the world by imposing English law and making it directly applicable. Second, the European Union led to harmonization and convergence through a deliberate political construct, creating what is the first supra-national capital markets regulator, the European Securities and Markets Authority (ESMA). Third, the United States of America gained hegemonic force of the post WWII period, nowadays benefiting from "*the powerful gravitational force of its capital markets".*

[73] C. Jordan, *International Capital Markets: Law and Institutions*, 16. There are many regulatory techniques that may be employed in the international capital market, namely: (i) *inaction:* relying on markets' ability to "regulate" themselves, which was an effective regulatory technique until the recent global financial crisis; (ii) *unilateralism*, *i.e.* taking regulatory and judicial actions in one's country domestic context; (iii) *formal and informal cooperative efforts*, *e.g.* the development of the International Organization of Securities Commissions (IOSCO); (iv) *international and supra-nationals initiatives*, especially since crises and contagions revealed the inadequacies associated with regulation operating at a nation state level, whereas finance operates at a globalised level.

[74] For an thorough overview of some relevant international experiences (*e.g.* Australia, the United Kingdom, USA, Japan, Hong Kong, China) *see* R. H. Huang, D. Schoenmaker (eds.), *Institutional Structure of Financial Regulation. Theories and International Experiences,* London, Routledge, 2015. This book explores the three main institutional structures of financial regulation in the world: (i) *the sectors-based model*, adopted in the US, China and Hong Kong; (ii) *the twin-peaks model* adopted in Australia and the Netherlands*;* (iii) *the single regulator model* represented by the Financial Conduct Authority (FCA) in the UK.

According to J. Dalhuisen, the aims of modern financial regulation can be summarized in the following principles:

(i) minimalization of systemic risk to address financial stability, *i.e.* preventing that the collapse of one financial firm might affect the others;

(ii) protection of clients against bankruptcy, bad selling or risky products;

(iii) creation of a proper legal framework for financial products, by managing legal risks through an adequate characterization of new financial products;

(iv) creation of a simplified enforcement system;

(v) protection of the payment system, that has to continue functioning regardless of bank insolvencies;

(vi) integrity and smooth operation of markets, especially with regard to the investment services industry;

(vii) prevention of monopolies among intermediaries in financial services to assure market integrity;

(viii) concerns with asymmetric markets, because markets themselves may not be rational;

(ix) creation of a level playing field (especially between commercial banks);

(x) concerns for the reputation and soundness of the financial services industry to guarantee public confidence on the financial community[75].

Accordingly, on the one hand, the emphasis of regulation is on service providers, meaning the intermediaries in the banking and securities business, along with the way they provide their services and offer their products to market participants: this is the micro-prudential point of view[76]. On the other hand, the emphasis is on mitigating risks to the financial system as a whole and promoting financial stability, *i.e.* the macro-prudential perspective[77]. The macro and micro-prudential approaches have different rationale. According to C. Borio, micro-prudential regulation aims at limiting distress of individual institutions, in order to ultimately reach consumer protection, both for

[75] J. Dalhuisen, *Dalhuisen on Transnational Comparative, Commercial, Financial and Trade Law Vol. 3,* Oxford, Hart Publishing, 2016, 492.
[76] *See* J. Dalhuisen, *Dalhuisen on Transnational Comparative, Commercial, Financial and Trade Law Vol. 3,* 492.
[77] J. Dalhuisen, *Dalhuisen on Transnational Comparative, Commercial, Financial and Trade Law Vol. 3,* 492. *See also* L. Amorello, *Macroprudential Banking Supervision & Monetary Policy. Legal Interaction in the European Union,* Cham, Palgrave Macmillan, 2018, 11 ff. For some interesting thoughts on the relationship between macroprudential regulation and financial stability, *see* R. Hockett, *The Macroprudential Turn: from Institutional "Safety and Soundness" to Systematic "Financial Stability" in Financial Supervision*, 9 Virginia Law & Business Review, 2015, 201 ff.

investors and depositors[78]. The risk model is exogenous, and the calibration of prudential controls is pondered in terms of risks of individual institutions (so-called "bottom-up approach")[79]. On the other hand, macroprudential supervision aims at limiting financial system-wide distress to ultimately avoid output (GDP) costs, its risk model is partially endogenous and prudential controls are pondered in terms of wide distress (so-called "top-down approach")[80]. While with regard to microprudential supervision the correlations and common exposures across institutions are irrelevant, within the macroprudential framework they are of fundamental relevance[81].

Against this backdrop, financial regulators employ four basic strategies to achieve their goals[82]:

(i) *rulemaking,* which consists of legislative setting of standards that are ought to be precise, transparent, intelligible and should inform the regulated person of the consequences of non-compliance. Rules can be formal, although informal rules have the advantage of being less expensive and are frequent in international financial regulation. The challenge is designing rules that are effective in suggesting the conduct desired by regulators;

(ii) *supervision,* which consists of monitoring, assessing and guiding the regulated entity in the process of meeting its regulatory obligations. The focus is on how best to apply existing rules and it is especially important in today's prudential framework for banks and other financial institutions;

(iii) *certification,* which means evaluating and approving the distribution of products and services. The final aim of certification is to promote quality, which poses many challenges because of the difficulties faced when developing criteria to measure it;

(iv) *enforcement,* which is the prosecution and punishment of those who fail to comply. Enforcement may be pursued through formal or informal means and regulators have a choice of the type of punishment (*e.g.* shaming penalties to impose reputational costs), depending on whether the objective is retribution or deterrence[83].

[78] C. Borio, *Towards a Macroprudential Framework for Financial Supervision and Regulation?,* Bank for International Settlements Working Paper No. 128, 2003, 2, available at https://www.bis.org/publ/work128.pdf.
[79] C. Borio, *Towards a Macroprudential Framework for Financial Supervision and Regulation?,* 2
[80] C. Borio, *Towards a Macroprudential Framework for Financial Supervision and Regulation?,* 2.
[81] C. Borio, *Towards a Macroprudential Framework for Financial Supervision and Regulation?,* 2.
[82] The list of strategies is drawn from E. J. Pan, *Understanding Financial Regulation,* Cardozo Legal Studies Research Paper No. 239, 2011, 13-19.
[83] E. J. Pan, *Understanding Financial Regulation,* 13-19. After the choice on the appropriate regulatory strategy, regulators have a second important choice to make between *public regulatory strategies* (that require public input and expenditure of regulatory resources) and *private regulatory strategies* (where they delegate the burden of regulation onto private actors).

In this context, globalization poses the biggest challenge by undermining the ability of individual states to regulate effectively, since sovereign countries still prefer to act unilaterally whenever is possible, applying their own laws[84]. This approach has many limits and cooperation is the only way to manage financial interdependence[85]. To this end, there can be at least five main objectives to be reached through international regulatory cooperation, which pose just as many challenges that might be solved using the comparative approach[86]:

(i) securing cross-border coordination of enforcement and supervision, by simply agreeing on information sharing and mutual assistance;

(ii) liberalizing international finance through the harmonization of regulatory requirements: sovereign states still tend to concurrently apply different rules to the same activities, accumulating duplicative and inconsistent requirements on regulated entities and creating cost and delays in cross-border finance;

(iii) compelling states to improve their financial regulation, ensuring all countries observe minimum standards;

(iv) securing collective action to raise prudential standards, in order to have a widespread adherence and compliance by participants who are tempted to defect and free-ride on the efforts of the others;

(v) making credible commitments to overcome the "time inconsistency problem", *i.e.* when an actor, like a regulator or a political entity, commits to a certain cause of action but, when it comes the time to implement it, the same actor's preferences have shifted, making it possible to others to act accordingly[87].

That being said, the call for international rules sometimes ignores the fact that some firms relocate their seat of operations in jurisdictions with optimal amount of regulation (not necessarily the ones with least amount of regulation)[88]. However, as long as there is a viable possibility for financial firms to do so, there will be significant limits on the enforcement of existing international agreements[89].

In addition, financial regulation has to face the challenges posed by the shadow banking sector, which can be effectively defined as *"a group of financial firms, infrastructure and practices that support financial transactions that occur beyond the*

[84] P. H. Verdier, *The Political Economy of International Financial Regulation,* 88 Indiana Law Journal, 2013, 1437.
[85] P. H. Verdier, *The Political Economy of International Financial Regulation*, 1438.
[86] The list of objectives is drawn from P. H. Verdier, *The Political Economy of International Financial Regulation*, 1439.
[87] P. H. Verdier, *The Political Economy of International Financial Regulation*, 1439.
[88] H. Scott, *International Finance. Transactions, Policy and Regulation,* 783.
[89] H. Scott, *International Finance. Transactions, Policy and Regulation,* 783.

reach of existing regulation. It includes hedge funds, money market funds and structured investment vehicles"[90]. In other words, shadow banks are financial firms that mostly look like banks, albeit structured in such a way as to avoid regulatory constraints: they mostly borrow short-term in debt markets, leverage themselves significantly and invest in long-term illiquid assets[91]. The shadow banking sector has remained largely untouched by post-crisis regulatory reforms, affecting the very financial product analyzed in this research, as we will explain further on[92].

1.4.1. *Financial regulation through the lens of comparative lawyers*

As argued above, comparative legal studies and financial law and regulation are different disciplines that pervade the ongoing debates of many legal scholars and practitioners. However, it is not common to find papers or books discussing the correlation between these two areas. The relevant questions therefore are why comparative lawyers "do not compare" financial regulation policies and why they should instead. Indeed, finance has developed on an international scale and the legal approach to it has become transnational. Notably, the last financial crisis made clear that we need to reconsider the way we address market failures by adopting cross-border coordinated responses. Financial transactions are *de facto* performed within a globalized market and involve all different kinds of actors (*e.g.* banks, governments, pension funds, etc.), but still regulatory standards are mostly dictated by national laws (or, if we consider the case of the European Union, by regional supranational laws)[93]. Of course, some efforts in the harmonization process have been made at international level (*e.g.* the Basel Capital Accord on mandatory capital requirements for banks performing significant international

[90] S. Valdez, P. Molyneux, *An Introduction to Global Financial Markets,* London, Macmillan Palgrave, 2016, 504. The authors add that "*Investment banks were blamed for undertaking lot of securitization business via the shadow banking system, but they are not shadow banking institutions themselves".*

[91] V. Acharya, T. Sabri Öncü, *The Repurchase Agreement (Repo) Market,* in V. Acharya, T. Cooley, M. Richardson, I. Walter (eds.), *Regulating Wall Street. The Dodd-Franck Act and the New Architecture of Global Finance,* Hoboken, Wiley, 2011, 319. The most important component of shadow banking is securitised debt. In 2009, the amount of securitised debt in the USA totalled $11.6 trillion.

[92] For a comparative overview of the shadow banking system and the economic rationale of its regulation, *see* A. M. Pacces, H. Nabilou*, The Law and Economics of Shadow Banking,* 7. The authors point out that "*shadow banking is effectively banking, albeit carried out in such a way as to avoid regulatory constraints".*

[93] T. Marauhn, *Introduction: The Regulatory Dilemma in International Financial Relations,* in R. Grote, T. Marauhn (eds.), *The Regulation of International Financial Markets. Perspectives for Reform.* Cambridge, Cambridge University Press, 2006, 13.

operations). However, most of financial law enforcement and implementation still relies on national discretion[94].

Some comparative law scholars realized that in order to understand and interpret the *law and finance* paradigm the classical approach based on legal traditions is relatively unhelpful, since the debate on this subject has become transnational, if not global[95]. Also, some law and finance scholars have recently applied comparative law instruments to their studies on legal and economic development[96] and some studies speculate on the revival of comparative law and economics[97]. Still, financial services regulation and policy remains mostly ignored by the comparative law scholarship.

A recent publication[98] suggested different reasons to explain this:

(i) the cross-sectoral nature of financial regulation as opposed to the traditional distinction between public law and private law, which still pervades many academic works of comparative scholars;

(ii) the nostalgic attachment of comparatists to the classical concept of legal families and traditions, primarily civil vs common law, which in fact does not easily apply to the mixed nature of finance;

(iii) financial globalization itself challenges the very same existence of comparative law because of the flattening of cross-border differences[99].

These findings represent a sound starting point to carry out a comprehensive review of the comparative methodology to financial regulation. Therefore, if comparative lawyers do not occupy themselves with this field of law, it is primarily because of the difficulties encountered when defining a research comparative methodology applicable to financial law. In this regard, we believe it is no longer relevant the critique regarding the assumption that the distinction between public and private law may refrain them from comparing financial laws systems. Even though "financial law" is still generally used to refer to the private side of financial markets, while "financial regulation" points towards the public side, no satisfactory argument about finance may be carried out regardless of

[94] H. Scott, *International Finance: Rule Choices for Global Financial Markets,* in A. Guzman, A. Sykes (eds) *Research Handbook in International Economic Law*, Cheltenham, Edward Elgar Publishing, 2007, 388.
[95] *See* M. Siems, *Legal Origins: Reconciling Law & Finance and Comparative Law,* 52(1) McGill Law Journal, 2007, 55 ff.; for a fascinating analysis of the relationship between western law and the globalisation of (financial) rules, *also see* M. Bussani, *Il Diritto dell'Occidente. Geopolitica delle regole globali*, 74 ff.
[96] *See* M. Siems, S. Deakin, *Comparative Law and Finance: Past, Present and Future Research,* 166 Journal of Institutional and Theoretical Economics, 2010, 120 ff.
[97] *See* R. Michaels, *The Second Wave of Comparative Law and Economics?,* 59 University of Toronto Law Journal, 2009, 197 ff.
[98] *See* A. Pizzolla, *Comparative Law and Financial Regulation: Methodological Remarks*, 118 ff.
[99] A. Pizzolla, *Comparative Law and Financial Regulation: Methodological Remarks*, 122-137.

at least some basic understanding of some aspects of the other. On the contrary, globalization of legal rules is challenging the approach based on legal families and it should be re-addressed in a contemporary manner.

The way comparative law can and must contribute to the scholarship of financial regulation is by fostering an interdisciplinary approach which take into account its multifaceted structure. The analysis of legal norms and institutions has to be carried functionally and scholars must critically explain the opportunity of financial provisions in any particular jurisdiction, trying also to foresee the outcome that a legal provision seeks to achieve. Moreover, thorough an economic analysis of laws, comparative lawyers should analyze the potential impact of laws on people's behavior and its welfare, assessing whether there are more economically desirable alternatives to achieve the same outcomes. Finally, they should promote an empirical analysis of the relevant laws in order to assess their potential impact from an *ex post* perspective[100]. Overall, the study of the law and economics of capital markets should be comparative in nature and should involve the use of economic methodology to analyze the performances that different regulation policies have on a particular set of rules and market practices[101].

The horizontal analysis often provided through the comparison of national legal systems needs to shift to a functional, anti-positivistic approach which takes into consideration politics, sociology, and economics[102]. Consequently, simply comparing financial regulation schemes across the world, without characterizing them in the broader scenario, would somewhat be an inadequate intellectual exercise as this approach would fail to provide the general viewpoint on this subject. Contrary to other fields of law, in which a list of differences and similarities may actually be academically relevant, finance and laws are the results of a much more complicated phenomenon that involves not only legal analysis but also economics and finance understanding, that lawyers do not generally master.

[100] *See* L. Amorello, A. G. Martinez, *The Responsibility of Legal Scholars in the Italian Banking Crisis,* 2017, available at http://www.dirittobancario.it/approfondimenti/crisi-bancarie/responsibility-legal-scholars-italian-banking-crisis. The authors argue that the lack of education and expertise of regulators and bank managers played a major role in the crisis. Hence, the need for more internationally-minded and interdisciplinary-trained people in key supervising positions, both in public and private sectors.

[101] R. P. Malloy, *Law and Economics. A Comparative Approach to Theory and Practice,* St. Paul, West Publishing Co., 1990, 2-4. In this book the general discourse is on the economic analysis of law, but the methodology proposed is commendable.

[102] For a similar approach to another area of law, namely torts, *see* M. Bussani, M. Infantino, *Tort Law and Legal Cultures*, 63 The American Journal of Comparative Law, 2015, 77 ff.

SECTION II

1.5. *The evolution of wholesale funding and the rise of repo markets*

Wholesale funding - *i.e.* raising short-term finance from institutional investors and other financial institutions - plays a pivotal role in the financial system and financial institutions heavily rely on it to meet their liquidity needs[103]. Liquidity is the driven force behind the functioning of financial markets, whose very basic purpose is to organize flows of funds between lenders and borrowers[104]. Conventional banks have the chance to fund themselves by taking deposits, issuing longer-term equity or issuing debt[105]. However, banks themselves and non-banks financial intermediaries (which are not banks and are not authorized to raise funds through deposits), such as investment firms, look for a large part of their financing in the short-term wholesale funding markets where they are able to raise cheap, short-term financing from investors and other financial institutions[106]. These markets are generally highly liquid and can provide institutional investors with a valid alternative to cash in the form of income-producing assets that they can treat as cash flow for accounting purposes[107]. In addition, in the context of repurchase agreements, central banks are also to be considered market participants, as they substantially behave like conventional banks when engaging in borrowing and lending with commercial counterparties, in order to adjust their monetary policy or to fulfil their role of "lenders of last resort" (LOLR) by providing liquidity to banks in troubles[108].

Historically, wholesale funding was instrumental in triggering the financial crisis and spreading its negative externalities throughout the market. This market currently poses many challenges to global regulators, who struggle to develop a coherent framework to reduce systemic risk[109]. Despite the fact that short-term wholesale funding

[103] M. Barr, H. Jackson, M. Tahyar, *Financial Regulation: Law and Policy,* St Paul, Foundation Press, 2016, 1222.
[104] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, LSE Legal Studies Working Paper 21, 2015, 2.
[105] M. Barr, H. Jackson, M. Tahyar, *Financial Regulation: Law and Policy,* 1222.
[106] J. Armour, D. Awrey, P. Davies, L. Enriques, J. N. Gordon, C. Mayer, J. Paine, *Principles of Financial Regulation,* 452.
[107] G. Gorton. G. Ordoñez, *The Supply and Demand for Safe Assets,* National Bureau of Economic Research Working Paper No. 18732, 2013, 3.
[108] Bank for International Settlements (BIS), *Implications of Repo Markets for Central Banks,* 1999, 3.
[109] M. Barr, H. Jackson, M. Tahyar, *Financial Regulation: Law and Policy*, 27.

markets are susceptible to financial runs[110], they have not been subject to the same prudential regulations and supervision which apply to conventional banks (nor have those financial institutions, including banks, that rely on this market)[111]. However, the last financial crisis unveiled the need for structural regulatory reforms and policymakers and regulators have published some far-reaching proposals (*see infra para. 3.5. and 3.6.*).

The evolution of repo contracting roughly follows the development of short-term wholesale funding[112]. Given the peculiar nature and features, repos represent an instrument that may permit to analyze not only the contractual structure of well-developed financial agreements, but also some major features of the global banking system. Besides, the repo market represents a significant source of funding for the shadow banking sector[113]. Wholesale funding has grown enormously in the last decades following the emergence of Money Market Mutual Funds (MMMFs), which developed starting from the 1970s, as dealers and institutional investors gained power in the global financial markets. MMMFs are financial intermediaries that manage low-risk securities through a fund in which investors are able to withdraw their securities at short notice[114]. The primary objective of an MMMF is to maintain the value of the principal of its assets[115]. Because this dealers' financing model is functionally paralleling the traditional deposit-taking model of banks, the risks posed to financial stability are substantially the same, as we will further see in this research[116].

The three most relevant sources of wholesale funding are commercial papers (*i.e.* unsecured, short-term debt instruments), securities lending (*see infra para. 2.6.*) and repurchase agreements[117]. As argued above, a repo is a sale of securities on an initial date,

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[110] In the words of M. Barr, H. Jackson, M. Tahyar, *Financial Regulation: Law and Policy,* 1223, "*Short-term wholesale funding sources vary in form and complexity, but each are short-term liabilities on a firm's balance sheet that investors can pull in a short time frame. If a firm's wholesale investors withdraw their funding simultaneously, the firm will not have enough cash on hand to satisfy those withdrawals, requiring the firm to sell assets. Forced liquidations of assets, or fire sales, can lead to additional asset value declines, more runs, more fire sales, and so on. During the Financial Crisis, this downward spiral helped to push some firms into insolvency and brought others to the brink of collapse".*

[111] J. Armour, D. Awrey, P. Davies, L. Enriques, J. N. Gordon, C. Mayer, J. Paine, *Principles of Financial Regulation*, 459.

[112] V. Acharya, T. Sabri Öncü, *The Repurchase Agreement (Repo) Market,* 319.

[113] I. Agur, S. Sharma, *Rules, Discretion and Macroprudential Policy,* in R. H. Huang, D. Schoenmaker (eds.), *Institutional Structure of Financial Regulation. Theories and International Experiences,* London, Routledge, 2015, 59.

[114] M. Barr, H. Jackson, M. Tahyar, *Financial Regulation: Law and Policy,* 1198. MMMFs portfolios are made of short-term securities representing liquid debt and monetary instruments, including repos.

[115] M. Kacperczyk, P. Schnabl, *Money Market Funds. How to Avoid Breaking the Buck,* in V. Acharya, T. Cooley, M. Richardson, I. Walter (eds.), *Regulating Wall Street. The Dodd-Franck Act and the New Architecture of Global Finance,* Hoboken, Wiley, 2011, 305. In 2007, the money market funds sector had more than $3 trillion of assets under management.

[116] M. Kacperczyk, P. Schnabl, *Money Market Funds. How to Avoid Breaking the Buck,* 306.

[117] Prime brokerage deposits and derivatives contracts can also be used as a short-term funding tool. *See* J. Armour, D. Awrey, P. Davies, L. Enriques, J. N. Gordon, C. Mayer, J. Paine, *Principles of Financial*

coupled with an agreement to repurchase the same securities at a specified price at the maturity date. The difference between the sale price and the repurchase price is known as the repo rate, which is the equivalent of an interest rate. Repo is at the heart of the modern financial market. First, it represents an attractive instrument for investors and borrowers seeking to finance their activities due to its flexibility in terms of use[118]. Second, the growth in repo trading has attracted all kinds of market participants, including investment banks, borrowers, investors, broker dealers or central banks[119]. Notwithstanding its structural importance and market size, the legal literature on repo has received little attention when compared to other areas of financial activity. This is due primarily because the repo market is widely recognized as a fast-moving area which only economists and banking practitioners may fully appreciate.

Against this backdrop, the market for repurchase agreements has evolved in an over-the-counter (OTC) dimension, under the radar of regulators, taking advantage of regulatory arbitrage[120]. OTC products are those financial instruments traded on non-regulated venues[121], where buyers and sellers may freely trade on a bilateral basis[122]. The

Regulation, 452. Commercial papers will not be addressed in the following pages. Suffice it to say, commercial paper is unsecured short-term debt, issued with a fixed maturity of less than one year. It is a money market security issued in order to meet short-term debt obligations. It is not backed by collateral, therefore only corporations and firms with good credit ratings will be able to sell at reasonable prices. In most cases, commercial paper is issued at a discount to face value, therefore the interest rate consists of the difference between the issue price and the face value itself. Those firms using commercial paper will often pay off the maturing commercial paper by issuing new one, hence the risk arising from operations involving commercial paper is called "rollover risk", that is the risk that funds raised will not be sufficient to fulfil payment to the existing commercial paper holders. There are three types of commercial paper: (i) *financial commercial paper*, issued by financial firms; (ii) *corporate commercial paper*, issued by non-financial firms; (iii) *asset-backed commercial paper*, or ABCP, issued by special purpose entities. For more information, *see* also M. Barr, H. Jackson, M. Tahyar, *Financial Regulation: Law and Policy,* 1234 ff.

[118] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 5.

[119] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 4-5.

[120] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 14.

[121] A. Hudson, *The Law on Financial Derivatives,* London, Sweet and Maxwell, 2006, 1.

[122] The over-the-counter (OTC) market is a decentralised market, *i.e.* without a physical location, therefore it is much less transparent, and it is subject to fewer regulations. Together with more conventional exchange markets, it is one of the two basic alternatives to structure a financial market. Market participants trade through various communications models, especially trough electronic trading systems. Dealers act as market-makers: they quote prices at which they will buy and/or sell financial products, possibly with others counterparties who do not even know the price at which the transaction was completed. Almost every financial product can be traded on OTC markets, especially derivatives, currencies and structured products, but also equities. They pose more risks than conventional trading markets, namely the so-called counterparty risk, that is the risk associated with the event that one party in the transaction defaults before the completion of the trade or does not make full payment of the amounts agreed upon in the contract. For more information, *see* R, Frederick, *Regulation of OTC Derivatives,* in E. Parker, M. Perzanowski, *Practical Derivatives. A Transactional Approach,* Horsell, 2017, 25 ff.; *see also* J. Dalhuisen, *Dalhuisen on Transnational Comparative, Commercial, Financial and Trade Law Vol. 3*, 137 ff.; *see also* H. Scott, *International Finance: Transactions, Policy and Regulation*, 405 ff.; *see also* A. Hudson, *The Law on Financial Derivatives,* 1 ff. For further comments on how to effectively regulate OTC derivatives markets,

OTC space is characterized by a large degree of financial innovation. Banks are in fact incentivized to fine-tune their risk management and leverage needs, as OTC instruments are mostly off-balance sheet items from a regulatory or statutory disclosure perspective[123]. This market is considered generally opaque and falls out from strict regulatory supervision.

Historically, repos have a long-standing presence in global financial markets and have had a peculiar evolution, especially in the United States. A repo trading facility was first established in the United States as the main tool of the Federal Reserve's (*i.e.* the US central bank, also known as "the Fed") open market operations, both to drain liquidity from the banking system in the form of surplus cash, and to add liquidity when needed. In times of financial distress, if the liquidity squeeze in the banking system was temporary, the central bank could react by entering into so-called open market operations (OMOs) - *i.e.* when a central bank is buying and selling in the open market - in order to provide banks with liquidity in exchange for bank reserves[124]. Federal Reserve Banks - *i.e.* the twelve operating districts of the US central bank[125] - used them as early as 1917 to extend credit to member banks[126], at a time when rediscounting[127] was unattractive because of a wartime tax[128]. During the 1920s, the Fed kept using repos to extend credit

see C. Baker, *Regulating the Invisible: the Case of Over-the-Counter Derivatives,* 85 Notre Dame Law Review, 2010, 1287 ff.

[123] V. Acharya, O Shachar, M. Subrahmanyam, *Regulating OTC Derivatives,* in in V. Acharya, T. Cooley, M. Richardson, I. Walter (eds.), *Regulating Wall Street. The Dodd-Franck Act and the New Architecture of Global Finance,* Hoboken, Wiley, 2011, 368. According to S. Valdez, P. Molyneux, *An Introduction to Global Financial Markets,* 502, off-balance risk sheets are *"risks for bankers other than activities that end up as an asset on the balance sheet. For example, standby loans, standby letters of credit, derivatives generally"*

[124] J. Cullen, *The Repo Market, Collateral and Systemic Risk: in Search of Regulatory Coherence,* in I. H-Y. Chiu, I. G. MacNeil (eds.)*, Research Handbook on Shadow Banking. Legal and Regulatory Aspects,* Cheltenham, Edward Elgar Publishing, 2018, 91.

[125] The Federal Reserve System, the US central bank, was set up in 1913 with a single central bank controlling note issue and operating it through 12 Federal Reserve districts, *see* S. Valdez, P. Molyneux, *An Introduction to Global Financial Markets,* 502.

[126] Following WWI, the Federal Reserve System tried to encourage the development of a money-market mechanism that would permit faster ownership transfer of both banker's acceptances and Treasury certificate of indebtedness. Since direct lending to dealers was not authorised by the Federal Reserve Act, Fed officials realized that repurchase agreements could be a useful tool in assisting dealers if they were permitted access to Federal Reserve Banks, *see* E. Simmons, *Sale of Government Securities to Federal Reserve Banks under Repurchase Agreements,* 9(1) Journal of Finance, 1954, 26.

[127] Rediscount is a way of financing banks or other financial institutions. It consists of discounting a short-term negotiable instrument for a second time in order to adapt to highly loan-demanding markets. This cash-generating tool has proven useful when there is low liquidity in the market, and it was widely used especially in the 19th and 20th century. In fact, rediscounting of commercial paper was the only way the Fed injected liquidity in the market before the birth of repo market, *see* E. Simmons, *Sale of Government Securities to Federal Reserve Banks under Repurchase Agreements,* 23 ff.

[128] K. Garbade, *The Evolution of Repo Contracting Conventions in the 1980s,* 12(1) Federal Reserve Bank of New York Economic Policy Review, 2006, 28.

also to non-bank dealers to encourage a liquid market for bank acceptances[129]. However, repos were no longer used during the Great Depression[130]. During World War II, a special type of repo transaction was adopted by the Fed to encourage the holding of Treasury bills by banks and institutional investors: this arrangement, however, differed from the previous repurchase agreements with government security dealers[131]. The heavy deficit left by WWII shaped a new money market machinery. Eventually, in 1951 repo financing reappeared, and the contracting conventions associated with its revival grew in importance and repo transactions were at that point undertaken in Treasury securities[132]. The Treasury Federal Reserve Accord of March 1951 placed new emphasis on controlling inflation, while at the same time loosening the low-interest-rate policy[133]. Because of this move, nonbank dealers were in need of cheaper financing that what was made available from the New York banks that used to fund most of their loans[134]. At the same time, the raise of interest rates gave local governments and non-financial institutions an incentive to substitute their loans with interest-free bank deposits, making repo ideally suited for both dealers and institutional cash managers[135]. The advantages were numerous: low risk, simple operational functioning, flexible maturities and suitable contracting conventions.

Later, the repo market expanded in the 1970s and early 1980s when short-term interest rate peaked, marketable Treasury debt grew, and longer-term interest rates became more volatile, thereby making repos even more attractive to creditors: it is estimated that by the end of 1980 bank and non-bank dealers were borrowing some $55 billions on repurchase agreements, and the following year up to $94 billions[136]. However, the existing contracting conventions proved inadequate for the unrestrainable market expansion.

The further evolution of the repo market was shaped by the failures of two small securities dealers (Drysdale Government Securities and Lombard-Wall) in 1982 and by

[129] An acceptance is a contractual agreement to pay the amount due at a specified date. Repo was therefore transacted through this kind of bank bills and these trades were originally known as "resale agreements".
[130] E. Simmons, *Sale of Government Securities to Federal Reserve Banks under Repurchase Agreements*, 26. During the 1930s, following the Great Depression, the use of repos became forgotten because conditions in the money market became extremely "easy": for instance, the volume of bankers' acceptances decreased greatly. Again, in 1936, repos were not even mentioned in the newly issued regulation governing the Federal Open Market Committee.
[131] E. Simmons, *Sale of Government Securities to Federal Reserve Banks under Repurchase Agreements*, 27. Under this new Treasury bill repurchase agreement, any holder of Treasury bills was able to sell them to the Fed, under the option of repurchasing the same amount of bills with the same maturity at any time prior to the bill maturity itself; however, the seller was not obliged to repurchase.
[132] K. Garbade, *Repurchase Agreements as an Instrument of Monetary Policy at the Time of the Accord,* Federal Reserve Bank of New York Staff Reports No. 780, 2016, 9-10.
[133] K. Garbade, *The Evolution of Repo Contracting Conventions in the 1980s*, 29.
[134] K. Garbade, *The Evolution of Repo Contracting Conventions in the 1980s*, 29.
[135] K. Garbade, *The Evolution of Repo Contracting Conventions in the 1980s*, 29.
[136] K. Garbade, *The Evolution of Repo Contracting Conventions in the 1980s*, 31.

the US courts which issued a number of rulings on the legal treatment of repo in bankruptcy[137]. The collapse of the former dealer led to a change in the treatment of accrued interest - *i.e.* the amount of interest earned on a debt but not yet collected[138] - on repo securities: resolutions calling for recognition of accrued interest were adopted under the auspices of the Federal Reserve. Before Drysdale, market convention did not call for the collateralization of accrued interest on government loans, leading to significant exposures[139]. On the other hand, the failure of the latter pushed for the exemption of repo transactions from the automatic stay mechanism, which is a statutory injunction that stops creditors from undertaking actions to collect on their debt, forcing creditors' participation in the collective process of insolvency[140]. In the case of Lombard Wall, the court ruled that securities purchased in repo transactions were not the property of repo lenders, making them subjected to automatic stay[141]. But market participants had different expectations on the ruling, as they thought repo were to be constructed as a sale and not as a loan: this led to efforts in order to make legislative amendments to the applicable laws (not without some resistance from the Treasury Department)[142].

Moreover, before the mid-1980s taking possession of repo securities was an expensive undertaking as creditors had to find a bank to hold the securities in a custodial account, paying for each transaction[143]. Accordingly, some creditors used to accept so-called "letter repos", which represented a statement in which the repo borrower declared that the clearing bank was holding the creditor's repo securities in a segregated account[144]. However, in 1984 and 1985, the collapse of Lion Capital Group incentivized the

[137] K. Garbade, *The Evolution of Repo Contracting Conventions in the 1980s*, 32.
[138] According to S. Valdez, P. Molyneux, *An Introduction to Global Financial Markets,* 493, accrued interest is *the interest accrued so far on a bond and payable by the purchaser, quoted separately from the clean price".* Basically, we can think of it as debt interest that has not yet been collected. However, before 1982, there was absolute neglect of accrued interest in repurchase agreements.
[139] *See* K. Burke, G. Martello, *The Evolution of Securities Lending,* in F. Fabozzi (ed.), *Securities Lending and Repurchase Agreements,* New Hope, Frank J. Fabozzi Associates, 1997, 8-9. The failure of Drysdale also led to other reforms of the way business in the sector was conducted. For instance, contracts were ultimately standardized, collateral margins and specifications prescribed, coupon accruals established and counterparties and their balance sheets carefully scrutinized.
[140] S. J. Lubben, *Repeal the Safe Harbors,* 18 American Bankruptcy Institute Law Review, 2010, 323. Historically, courts were not sure whether repos were collateralized loans or a sale combined with a buy-back agreement. For instance, in 1982 the Federal Bankruptcy Court of New York ruled that repo was a collateralized loan, but in 1984 Congress adopted the Bankruptcy Amendments and Federal Judgeship Act that exempted repo transactions from automatic stay.
[141] F. Maclachlan, *Repurchase Agreements and the Law. How Legislative Changes Fuelled the Housing Bubble,* 48 Journal of Economic Issues, 2014, 517.
[142] F. Maclachlan, *Repurchase Agreements and the Law. How Legislative Changes Fuelled the Housing Bubble,* 517.
[143] K. Garbade, *The Evolution of Repo Contracting Conventions in the 1980s,* 37. The solution was found in the tri-party repo market, which was already pioneered by Salomon Brothers in the late 1970s to reduce the cost of financing its positions in Treasury securities. Basically, the growth of tri-party repo transactions was driven by a quest for profit.
[144] K. Garbade, *The Evolution of Repo Contracting Conventions in the 1980s,* 37.

creditors' possession of repo securities: creditor losses on letter repos were the trigger for the creation of a safer and operationally cheaper tri-party repo market, in which an agent bank would stand between the dealer and the creditor[145]. In the 1990s, this market was characterized by the appearance in the markets of Central Counterparty Clearing (CCP)[146] - *see infra para. 3.2.1.* - and the development of electronic trading platforms[147].

Another important milestone in the development of repos occurred in 2005, when Congress enacted the Bankruptcy Abuse Prevention and Consumer Protection Act (BAPCPA) in order to broaden the definition of repos to include mortgage loans, mortgage-related securities and interest from mortgage loans and securities, so that all mortgage-related repos are now exempt from the application of automatic stay[148]. As explained further below, other developments that strongly influenced the American repo market occurred during the last financial turmoil.

Learning from the American experience, non-dollar repo spread around the world, but the situation in Europe has diverged in some ways. The repo market developed both in the US and EU (including the UK) keeping different market characteristics in each jurisdiction: not only they present diverging structural and operational features, but certain peculiarities also affect the contractual structure of repos (*e.g.* different legal treatment of collateral transfer and bankruptcy regimes)[149]. Whereas the market for repurchase agreements was born in the US as early as the 1920s, it was only during the 1970s that something similar developed in continental Europe, and as late as 1990s in the United Kingdom[150]. Like in the US, repos were originally used as the main monetary policy tool by central banks to adjust liquidity in the markets through daily open market operations. For instance, the Italian repo market started in the late 1970s through banking practices and it is the oldest in Europe, while Germany, France and Spain began to experience a rise in repo trading only in the 1980s[151].

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[145] K. Garbade, *The Evolution of Repo Contracting Conventions in the 1980s,* 38.
[146] S. Skyrm, *10 Events that Changed the Repo Market,* 2013, 2, available at http://scottskyrm.com/2013/10/10-events-that-changed-the-repo-market/. In the mid 1990s, two clearing houses dominated the US market, Delta Clearing Corp. and Government Securities Clearing Corp.
[147] S. Skyrim, *10 Events that Change the Repo Market,* 2013, 2. The first platform on which repos were traded was called Brokertec.
[148] V. Acharya, T. Sabri Öncü, *The Repurchase Agreement (Repo) Market,* in V. Acharya, T. Cooley, M. Richardson, I. Walter (eds.), *Regulating Wall Street. The Dodd-Franck Act and the New Architecture of Global Finance,* New York, 2011, 330.
[149] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 14. These differences are going to be addressed in the following chapter.
[150] P. Hördal, M. King, *Developments in Repo Markets during the Financial Turmoil,* Bank for International Settlements Quarterly Review, 2008, 38.
[151] P. Harding, C. Johnson, *A Practical Guide to Using Repo Master Agreements. Existing Market Practice for Legal Documentation in Europe and the USA,* Petersfield, Harriman House, 2017, 1.

In Germany repos became common through the local branches of American investment banks and lately spread across the market as continental financial institutions began to use these instruments in their daily operations[152]. In this respect, it is worth noting that the large part of repo transactions involving German counterparties did not happen in Germany, but rather in London, in view of its predominance in the financial sector[153]. Still, the Frankfurt financial market infrastructure largely benefited from the growth of its repo market, as Deutsche Börse provided trading, clearing, and settlement layers, enabling the creation of an integrated, centralized repo market, where the core product was a General Collateral-Pooling repo service[154]. This market had been so successful in attracting banks and sovereign participants from across Europe that German repo rates became a substitute for the declining inter-bank funding markets to such an extent that the European Central Bank (ECB) began to use the Eurex Repo rate as a benchmark[155]. Also, repo grew more in importance when Bund futures contract[156], a government-issued German bond, was introduced on LIFFE (the London International Financial Futures and Options Exchange) and when Notionel contract[157], a French government bond, was introduced on MATIF (Marché a Term International de France, later absorbed by the former Paris Stock Exchange, now Euronext Paris) in Paris[158]. In the Eurobond market, the driver behind the growth of repo was the higher cost of borrowing securities from the two major clearing players, Euroclear and Clearstream.

In the UK, a market in equity repo was already operational in London from 1992, but an open gilt repo market was introduced in the United Kingdom only in January 1996 and had huge impact on the unsecured money market and generally on liquidity and turnover of the gilt market itself[159]. Gilts are low-risk investment bonds issued by the British government, basically the UK equivalent of US Treasury securities (the original certificates had gilded edges, hence the origin of the name)[160]. It all began in London in 1986, when the so-called "Big Bang" reform package was adopted by the Thatcher government in order to push for sudden deregulation of the City's financial markets to

[152] C. Schindler, M. Hindelang, *Praxishanbuch Repos und Wertpapierdarlehen,* Wiesbaden, Springer Gabler, 2016, 14.
[153] C. Schindler, M. Hindelang, *Praxishanbuch Repos und Wertpapierdarlehen,* 14.
[154] T. Book, *Derivatives and Repurchase Markets in Germany*, 27(4) Journal of Applied Corporate Finance, 2015, 90.
[155] T. Book, *Derivatives and Repurchase Markets in Germany*, 90.
[156] A Bund is bond issued by the German federal government, it is based on a long-term debt and it is considered the benchmark for long-term government debt.
[157] The Notionel is a French government bond traded on MATIF.
[158] M. Choudhry, *The Repo Handbook,* 7.
[159] M. Choudhry, *The Repo Handbook,* Oxford, Elsevier Science, 2010, 3.
[160] M. Choudhry, *The Repo Handbook,* 3.

increase global competitiveness. Accordingly, investment banks began trading in repos to finance their bond positions, as they were at that point in need for lower financing rates[161]. At a later time, the introduction of repos in open market operations in the UK by the Bank of England was part of a framework of structural reforms undertaken in the 1990s to bring market practices up to date and was arguably the most successful provision adopted in the reforms package[162].

As argued further below, the further evolution of the European repo market has been largely dependent upon the last financial crisis, similarly to what happened in the United States (*see infra para. 1.6.*). Today the role of repo is of utmost importance in Europe, as the European Central Bank commonly provides liquidity through repo transactions: article 18.1 of the European Central Bank Statute *(see infra para. 3.3.*) expressly recognizes repos as one of its monetary policy instruments[163].

For the time being, suffice to say that the growth and development of repo markets across the globe in the last decades - both in the money market and as a monetary policy tool - was primarily due by the following factors, which are going to be fully scrutinized in the last chapter:

(i) the ease of the transaction itself;

(ii) a large volume of government bond markets followed by a general expansion in public debt;

(iii) the volatile interest rates;

(iv) the arbitrage opportunities against other money market instruments;

(v) the link between the repo market and derivatives markets by means of hedging;

(vi) the fact that repos are alternative to bank deposits for corporate treasurers and also an alternative to unsecured instruments such as commercial paper;

(vii) institutional investors can gain additional income by making their assets available for repo, while maintaining their portfolio intact[164].

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[161] M. Choudhry, *The Repo Handbook,* 265.

[162] M. Choudhry, *The Repo Handbook,* 265. The package of reforms reached its peak in the years 1994 and 1995, in a wake of significant change proposed for the gilt borrowing and lending market and the sterling market in general, when the Bank of England released its Autumn 1994 paper, calling for consultations with the various market participants to change the existing market structure. Before its introduction, stock borrowing and lending in the gilt market was available only to gilt-edged market makers, the so-called GEMMs, who could only deal through approved intermediaries known as Stock Exchange Money Brokers, the SEMBs. After the introduction of the open gilt market, all market participants could borrow and lend gilts.

[163] ESCB and ECB Statute, Chapter IV "Monetary Functions and Operations of the ESCB", article 18.1 "Open Market and Credit Operations" states the following: "*In order to achieve the objectives of the ESCB and to carry out its tasks, the ECB and the national central banks may operate in the financial markets by buying and selling outright (spot and forward) or under repurchase agreements and by lending and borrowing claims and marketable instruments, whether in euro or other currencies [...]".*

[164] *See* M. Choudhry, *The Repo Handbook,* 7 ff.

1.6. *Repos and the financial crisis*

The financial crisis of 2007-2009[165] was primarily due to the US housing bubble burst, fueled by loan securitization, which allowed the removal of risk from bank's balance sheets and freed up capital for more lending[166]. Specifically, securitization is the process whereby cash flows generated by illiquid assets are pooled together and sold as more liquid asset-backed securities: in other words, it means converting an existing loan into securities, which can be sold in the financial market to gain more money to invest[167]. The loan securitization mechanism allowed banks to keep the loans out of their books, so they could repackage them and sell them to investors, so that they were eventually transferring risk to the end-purchasers of the securities, without having to concern with the ability of borrowers to repay the loans[168]. In the process, low-regulated entities entered the financial market with excessive speculative purpose, enhancing destabilization in the financial system through their exaggerated recourse to securitization[169]. Overall, it was a crisis not only of the traditional banks, but also of the shadow banks.

Against this background, the general legal and economic narrative on the financial turmoil has developed with regard to the growth in securitization, debt-finance structure products - *e.g.* collateralized debt obligations (CDOs)[170] - and massive use of OTC

[165] This timing is generally accepted, but the crisis did not actually end in 2009, rather eventually mutated in a sovereign debt crisis, especially in some European countries.
[166] C. Brummer, *Soft Law and the Global Financial System. Rule Making in the 21st Century,* 219. The author also outlines the historical background of the financial crisis, which is not being addressed in this text, although a few remarks are worth mentioning. Since the 1990s, speculation in US real estate had reached unprecedented levels due to low interest rates and large inflows of foreign capital attracted by higher yields in US capital markets. The lending to subprime borrowers peaked but, since they did not qualify for traditional loans, they represented the riskiest category. Lenders used to believe that the long-standing trend of appreciating housing markets would continue, therefore granting easy terms on loans which were then used to buy real estate. Basically, the more subprime mortgages could be packaged together with different tranches of securities, the easier it would get to obtain the AAA rating which positively affected the final retail price. Hedge funds and investment banks, among others, got involved in the market as speculators and the demand for mortgage-backed securities exploded. New financial products, such as (synthetic) CDOs (collateralized debt obligations) and CDSs (credit default swaps) were created in order trade in this market, profiting from the low scrutiny received by rating agencies. At the same time, financial innovation enabled more transactions. However, in 2007 interest rates began to rise, while housing prices dropped, and homeowners were forced to default on their payments. Eventually the housing bubble popped in 2008 and all financial institutions reported major losses and many mortgage lenders went bankrupt.
[167] J. Armour, D. Awrey, P. Davies, L. Enriques, J. N. Gordon, C. Mayer, J. Paine, *Principles of Financial Regulation,* 460; S. Valdez, P. Molyneux, *An Introduction to Global Financial Markets,* 503.
[168] C. Brummer, *Soft Law and the Global Financial System. Rule Making in the 21st Century,* 219.
[169] C. Brummer, *Soft Law and the Global Financial System. Rule Making in the 21st Century,* 219.
[170] A CDO is a collateralized debt obligation, "*a type of asset-backed security whose value and payments are derived from a portfolio of fixed income underlying assets", see* S. Valdez, P. Molyneux, *An Introduction to Global Financial Markets,* 495.

derivatives products[171] - *e.g.* collateralized default swap (CDSs)[172] - but little attention has been given to the repo market[173]. Notwithstanding with the inadequate debate on the subject, the credit crisis has indeed involved a number of insolvencies, defaults and litigation affecting participants in the repo market[174]. As professor J. Schroeder provocatively argues, "*the financial crisis of 2008-09 introduced the general public to an alphabet soup of exotic sounding investment vehicles such as CDO's (collateralized debt obligations), SIV's (Structured Investment Vehicles) and CDS's (credit default swaps). At first blush, it may seem surprising, therefore, that the first financial firm bankruptcies after the bursting of the speculative bubble generated a number of cases involving a financial device that, in comparison, seems mundane and unfashionable - so 1990's. These are repurchase agreements or "repos" [...]*[175].

The role of repo market is crucial to define and understand causes and outcomes of the financial crisis. To this end, G. Gorton and A. Metrick argued that the panic of 2007-2009 was not so much a run on depository institutions, but more instead on the shadow banking system, and specifically a wholesale run on the sale and repurchase markets[176]. More specifically, the authors argued that problems in the subprime mortgages caused a systemic event due to a run in the repo market[177]. Their findings show that the nexus of the crisis was a combination of excessive securitization and repo finance, to which they refer to as "securitized banking", as repos are frequently collateralized with securitized bonds[178]. As the crisis sparked concerns on the liquidity of the bond markets, the value of assets declined when lenders realized they might need to sell their collateral, while repo haircuts (*i.e.* the difference between the initial market value of the asset and the purchase price of that asset at the start of a repo)[179] were raised by borrowers when the

[171] The market value of OTC derivatives is approximately $670 trillion, according to the Bank for International Settlements, *see* https://www.bis.org/statistics/derstats.htm.
[172] A CDS is a credit default swap, which involves selling credit risk for a premium, *see* S. Valdez, P. Molyneux, *An Introduction to Global Financial Markets,* 496.
[173] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 21.
[174] J. Schroeder, *Repo Redo: Repurchase Agreements After the Real Estate Bubble*, Cardozo Legal Studies Research Paper No. 360, 2012, 1.
[175] J. Schroeder, *Repo Redo: Repurchase Agreements After the Real Estate Bubble*, 1.
[176] *See* G. Gorton, A. Metrick, *Securitized Banking and the Run on Repo,* National Bureau of Economic Research Working Paper No. 15223, 2009.
[177] G. Gorton, A. Metrick, *Securitized Banking and the Run on Repo,* 1.
[178] G. Gorton, A. Metrick, *Securitized Banking and the Run on Repo,* 1. In the words of the authors, "*the current financial crisis is a system-wide bank run. What makes this bank run special is that it did not occur in the traditional banking system, but instead took place in the "securitized banking" system [which is] the business of packaging and reselling loans, with repo agreements as the main source of funds".*
[179] In a repo, like in every borrowing/lending agreement, the borrower passes collateral to a value in excess of the market value of the securities, in order to allow for "price rising": the excess is called the repo haircut.

lenders began to fear for the stability of the banks, eventually leading to the insolvency of the US banking system[180].

Regardless of which narrative the reader can use to explain the crisis, it is widely accepted that the last financial turmoil affected the development of repo markets. In fact, starting in 2007, repo markets began to show signs of stress because of general concerns about counterparty credit risk in the financial system and mostly because of an impelling demand for liquidity[181].

A first episode occurred in the very early stage of the financial crisis. In the summer of 2007, Countrywide Securities, the largest subprime mortgage lender in the US, revealed all the structural fragility of its funding system, which mostly relied on short-term financing through the issue of commercial papers and operations with tri-party repurchase agreements[182]. Once the lenders to Countrywide sensed its vulnerability, they refused to roll over its commercial papers, leaving it without cash to continue operating[183]. Bank of New York Mellon (BNYM), which was in charge of the clearing activities related to tri-party repo, threatened also to wind-up the firm's $45 repo billion repo book, but after negotiations between BNYM, Countrywide and officials from the Fed and the Treasury Department, the clearing bank agreed to unwind the repo portfolio, provided that Countrywide would have upgraded the pledged collateral, which the mortgage lender agreed to do[184].

In March 2009 market conditions deteriorated. Interbank markets (*i.e.* the market used by financial institutions to trade between themselves) and wholesale funding dried up and those market participants who could not rely on access to central bank liquidity struggled the most[185]. The overreliance on repos as a liquidity source led JPMorgan Chase to takeover Bear Stearns, with the assistance of the Federal Reserve[186].

[180] G. Gorton, A. Metrick, *Securitized Banking and the Run on Repo,* 5.
[181] P. Hördal, M. King, *Developments in Repo Markets during the Financial Turmoil*, 42. Actually, the impact on repo rates was initially less significant than the one on the overnight index swap (OIS) rate, which is a near risk-free benchmark, as OIC requires no payment upfront but it is settled on a net basis at maturity.
[182] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 21.
[183] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 21.
[184] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 21. If Bank of New York Mellon would have actually denied the unwind of repo portfolio, the market would have lost confidence in other similar financial institutions and on the tri-party repo market, though the biggest risk would have been related to a "fire sale" of the pledged assets, with lenders rushing to realise the value of their collaterals with sales.
[185] P. Hördal, M. King, *Developments in Repo Markets during the Financial Turmoil*, 43.
[186] P. Hördal, M. King, *Developments in Repo Markets during the Financial Turmoil*, 43.

The Fed also introduced a number of new facilities to permit liquidity to circulate again, namely the Term Securities Lending Facility (TSLF), a temporary collateral swap facility, which served to lend Treasury securities against eligible assets, and the Primary Dealer Credit Facility (PDCF) which extended the treatment usually reserved to depository institutions - *i.e.* the discount window-type borrowing mechanism - to primary dealers (*i.e.* those financial institutions that are authorized to make business deals with the Fed)[187]. These two programs ran until February 2010, when they were dismantled. The activity of the Federal Reserve improved the liquidity conditions of the markets, easing pressure through greater availability of government collateral for repo transactions, along with a reduced demand for Treasury securities[188].

Subsequently, Lehman Brothers Holding Inc. filed for bankruptcy under Chapter 11 (Title 11 of the United States Code, *see infra para. 2.2.*) on September 15, 2008. This event - widely acknowledged as the most seismic event to hit the financial markets in living memory[189] - was largely fueled by the use of repurchase agreements[190]. Lehman had found a way to temporarily remove securities inventory from its balance sheets through the so-called "repo 105" contracts[191], which involved a repurchase agreement in which the collateral sold was worth at least 105% of the repurchase price under the agreement[192]. Lehman would enter into "repo 105s" immediately before the end of a fiscal period in order to raise money to repay its debts, while at the same time re-borrowing money to close out the repos few days after the end of the same period, with the sole purpose to reduce its leverage[193] (*see infra para. 2.7.*).

After the collapse of Countrywide and Lehman, the two largest broker dealers on Wall Street, market participants who were repo lenders found themselves with enormous amounts of collateral that was supposed to be paid by the two defaulted repo borrowers: this triggered a fire sale of their devaluated collateral, which was further discounted[194]. Panic spread all around the US financial markets in a downward spiral. Reserve Primary Fund ("RPF"), one of the largest money market funds in the US, suffered a run, as it was

[187] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 26.
[188] P. Hördal, M. King, *Developments in Repo Markets during the Financial Turmoil*, 44.
[189] Lehman Brothers $600 billion in debt make it the largest bankruptcy filing in US history.
[190] Lehman had $197 billion in repo loans by the first quarter of 2008 according to F. Maclachlan, *Repurchase Agreements and the Law. How Legislative Changes Fueled the Housing Bubble,* 519.
[191] Repo 105 was term used for repos in debt securities, while "repo 108" with regard to repos in equity securities since they had different over-collateralization requirements.
[192] J. Schroeder, *Repo Redo: Repurchase Agreements After the Real Estate Bubble*, 18.
[193] J. Schroeder, *Repo Redo: Repurchase Agreements After the Real Estate Bubble*, 19.
[194] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void,* 25.

largely exposed to Lehman Brothers, triggering further concern for other MMMFs. The main events outlined above prove that repos were not only affected by the financial turmoil, but they were instrumental in fueling the liquidity crisis in the US.

Conversely, European countries and the UK witnessed lower volatility in their repo spreads, mainly because of the differences in the type of markets participants, differing central bank responses, availability of sovereign collateral and the way repo rates are calculated in the euro area[195]. Furthermore, the dominance in the US of investment banks, as opposed to the predominant model of universal banking in Europe, led to a more severe disruption in the US markets as these banks largely financed their highly leveraged positions with repo-like instruments[196]. In addition, European central banks had different operating procedures compared to those of the Federal Reserve[197]. For instance, the European Central Bank accepted a wide range of collateral for its lending operations from many counterparties, while initiatives such as the Eurex Repo-GC Pooling Market have generated sharp growth rates during the crisis[198]. GC Pooling became a highly liquid market for secured funding and participants could benefit from anonymous electronic trading through a central counterparty (CCP) with a real-time collateral management system that allowed reuse and pledging of collateral with ECB[199]. Across the Channel, the Bank of England introduced the Special Liquidity Scheme (SLS) in April 2008, a standing facility which allowed qualifying institutions to use an asset swap to upgrade their collateral, exchanging theirs with government securities[200].

Eventually, from mid-October 2008 onwards, the liquidity provisions taken by central banks to respond to turmoil in money markets and government intervention to recapitalize banks, both in US and Europe, led to an improvement of market conditions: repo rates were slowly normalized, and repo-involved financial players slowly returned in the market[201]. Not surprisingly, the financial crisis unveiled all the opacity of the repo market and its capacity to be a source of systemic risk. Surprisingly though, the post-crisis regulatory agenda (*e.g.* the Dodd-Franck Act[202]) almost ignored the repo market

[195] P. Hördal, M. King, *Developments in Repo Markets during the Financial Turmoil*, 45.
[196] P. Hördal, M. King, *Developments in Repo Markets during the Financial Turmoil*, 45.
[197] P. Hördal, M. King, *Developments in Repo Markets during the Financial Turmoil*, 45.
[198] http://www.eurexrepo.com/repo-en/markets/gc-pooling-market/.
[199] P. Hördal, M. King, *Developments in Repo Markets during the Financial Turmoil*, 48.
[200] P. Hördal, M. King, *Developments in Repo Markets during the Financial Turmoil*, 50.
[201] P. Hördal, M. King, *Developments in Repo Markets during the Financial Turmoil*, 50.
[202] The main goal of the Dodd-Franck act was to reduce systemic risk, which can reveal itself in three different ways: (i) through financial institutions that are "too big to fail"; (ii) through financial institutions that are "too connected to fail"; (iii) through financial institutions that are "too risk-correlated to fail". *See* A. Ferran, N. Moloney, J. Hill, J. Coffee Jr, *The Regulatory Aftermath of the Global Financial Crisis,* Cambridge, Cambridge University Press, 2012, 342.

and other significant portions of the over-the-counter derivatives infrastructure. The longer-term implications for repo markets in the regulatory perspective will be fully addressed in the last chapter (*see infra para. 3.5. and 3.6.*).

1.7. *Market size and the cross-continental scenario*

The repo market is largely over-the-counter, therefore estimates of its size are difficult to come by, due to the lack of transparency in the market. Immediately before the financial crisis, the repo market was thriving, doubling in size since 2002, reaching at the end of 2007 roughly $10 trillions in each of the US and European repo market, and another $1 trillion in the UK repo market[203]. In 2008, according to the former International Securities Market Association (ISMA), now part of the International Capital Market Association (ICMA), the turnover in eurozone countries and the UK was in excess of $30 trillions, and the US Treasury repo market alone was estimated to be very roughly at $3 trillions in the same year[204]. Data suggests that before the crisis, the sum of repos and reverse repos (*i.e.* repos viewed from the perspective of the buyer)[205] traded by primary dealers (which constitutes between 80% and 90% of total repos and reverse repos) reached an all-time peak of $7 trillions, while in 2007 the European markets had reached a little less than $7 trillions, but after the crisis both markets suffered, settling at around $4 trillions and $5.5 trillions, respectively[206]. G. Gorton and A. Metrick approximated the US repo market during the financial crisis to be $10/$12 trillion, although their calculation could include a double counting of repo and reserve repo transactions[207]. By the end of 2015, according to the Securities and Financial Markets Association (SIFMA), the American repo market's value fell to less than $4 trillion from the $7 trillion of early 2007[208].

[203] P. Hördal, M. King, *Developments in Repo Markets during the Financial Turmoil,* 37.
[204] M. Choudhry, *The Repo Handbook,* 3.
[205] A repurchase agreement viewed from the perspective of the buyer is called a reverse repo, so that repo and reverse repo are two sides of the same transaction: for each repo there is a specular reverse transaction in which the buyer purchases the seller's securities, with a simultaneous commitment to resell, and lends the seller cash by "reversing in" the securities, *see* S. Lumpkin, *Repurchase and Reverse Repurchase Agreements,* Federal Reserve Bank of Richmond Economic Review, 1987, 15.
[206] R. Perotti, *The Repo Market,* 2016, 7-8, available at http://rp.rperotti.com.
[207] G. Gorton, A. Metrick, *Securitized Banking and the Run on Repo,* 9.
[208] *See* https://www.sifma.org/resources/archive/research/.

Currently, to provide a complete overview on its market size and characteristics, one should compare the market dimensions in Europe and in the US, as they combined represent more than 70% of the global repo market[209].

The American repo scenario is primarily composed of a *bilateral OTC market*, which is the very backbone of the whole repo market, where repos are privately negotiated absent any intermediaries' intervention: because of the almost exclusive operation in an OTC framework, data for the bilateral market is harder to collect[210]. Alongside the "classic" repo space, there is an additional market that developed through a different pattern, the so-called *tri-party repo market*, in which the counterparties enter into a tripartite agreement with an independent clearing bank acting as an intermediary agent and providing collateral management services[211]. In the US the two clearing banks active in this market are JPMorgan Chase[212] and Bank of New York Mellon: they administer transactions and provide post-trading services (*e.g.* custody, selection, substitution and management of collateral and payment and settlement of the transaction)[213]. In a triparty repo structure, clearing banks are not parties to the transaction. Moreover, there is a segment of the US repo market which is experiencing expansion within the tri-party system, that is the General Collateral Finance (GCF) repo market, which only allows high-quality collateral to be posted in covered transactions. The GFC repo market was introduced in 1998 by the Fixed Income Clearing Corporation (FICC)[214], which acts as a clearing bank, in order to reduce transaction costs for dealers who operate through standardized repos, that are now anonymously traded through inter-dealer brokers and then cleared by the FICC[215]. In 2015, the nominal values of GFC repos netted and traded was around $585 billion, most of them being term repos. The FICC GFC was recently expanded to allow institutional investors to participate in the Centrally

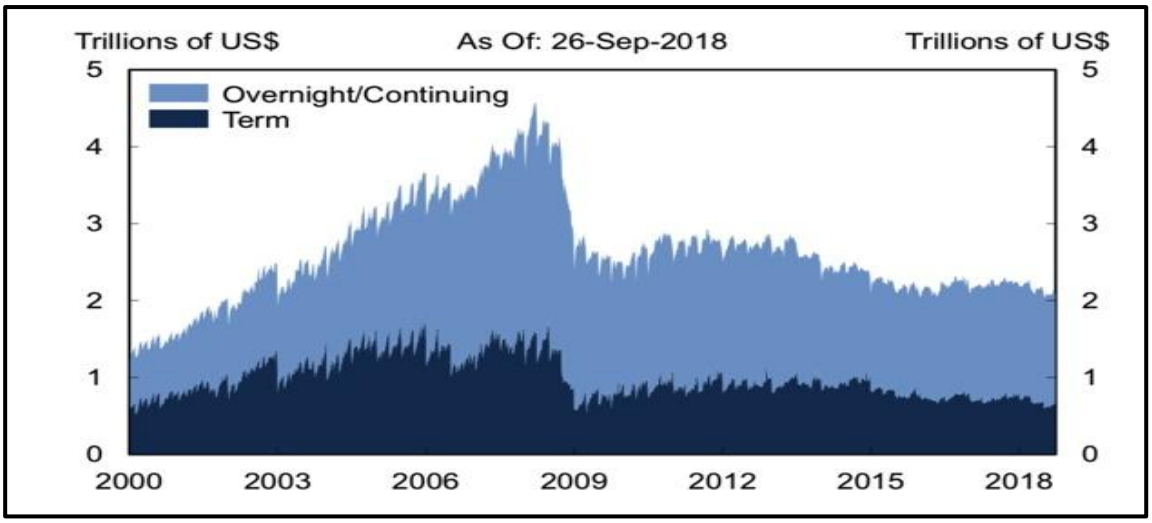
[209] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 15.
[210] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 14.
[211] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 14.
[212] JPMorgan Chase announced in July 2016 it would close its tri-party US Treasury repo business by the end of 2018. JPMorgan only has 15% of the market, while BNYM has the remaining 85% and will now be the only firm to offer such service. The exit is due to low margins and higher costing resulting from increased capital requirements mandated by the Dodd-Frank Act and Basel III. *See* Pensions & Investments, *JPMorgan exit from repo market seen as further regulatory fallout,* 16 August 2016, available at https://www.pionline.com/article/20160816/ONLINE/160819924/jp-morgan-exit-from-repo-market-seen-as-further-regulatory-fallout.
[213] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 14.
[214] The FICC is a branch of the Depositary Trust & Clearing Corporation (DTCC).
[215] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 20.

Cleared Institutional Triparty Service[216]. Also, the FICC-operated facility entered the bilateral market through a Delivery-versus-Payment (DVP) repo service. The triparty market is undergoing structural changes, as in July 2016 FICC suspended the execution of GFC collateral repo transactions on an interbank basis. Therefore, GFC dealers will now have to execute transactions only with market participants that settle with the same clearing bank[217]. A third branch of the American repo market developed on the so-called "hold-in-custody" model, in which the repo borrower does not transfer the securities to the lender, but it merely holds them in custody for the duration of the contract at a specific account[218]. This market developed in the 1990s for the government securities repo market and it is now less commonly used.

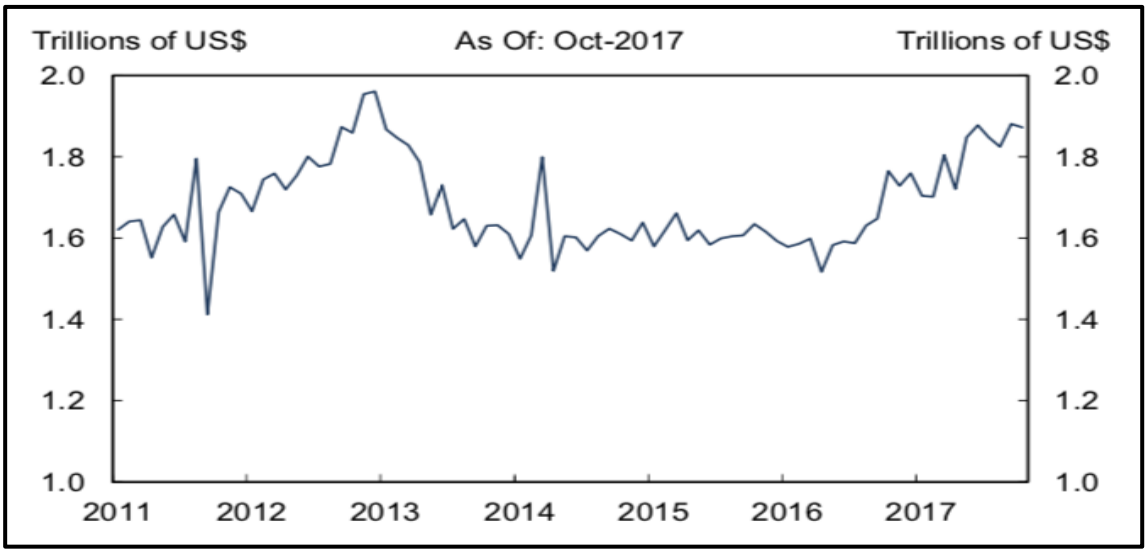
Today, according to latest data available, the total repo market borrowing by primary dealers ranged between a notional amount of $2 trillion and $2.3 trillion for the twelve months ending in September 2018, as in prior years[219]. The triparty activity (exclusive of GFC transactions) went from the $1.6 trillion of March 2016 to the $1.9 trillion of October 2017. Overall, even though US repo market has been generally stable over the recent years, the market fell in size abruptly if compared to pre-crisis levels. One of the reasons to explain this trend is the excessive regulation resulting from the post-crisis regulatory agenda, which increased capital requirements affecting dealers' available liquidity resources[220]. In the words of a market participant, "*[...] with less liquidity, it's more expensive to trade, harder to reallocate and (causes) more volatility because it puts the bid/offer spread wider [...], the fair value of a Treasury is out of whack because of this. If you have large amounts of Treasuries you need to buy or sell, (with) less repo, the costs of trading those could become punitive and force the investor to just sit on it [...], the decline in repo is more of a symptom. (of declining liquidity) as well"*[221].

[216] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 20.
[217] Financial Stability Oversight Council (FSOC), *Annual Report*, 2017, 51.
[218] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 15.
[219] Financial Stability Oversight Council (FSOC), *Annual Report*, 2018, 44; *see also* Securities Industry and Financial Markets Association (SIFMA), *Repo Market Fact Sheet*, 2017.
[220] Pensions & Investments, *JPMorgan exit from repo market seen as further regulatory fallout,* 16 August 2016, available https://www.pionline.com/article/20160816/ONLINE/160819924/jp-morgan-exit-from-repo-market-seen-as-further-regulatory-fallout.
[221] *See* Pensions & Investments, *JPMorgan exit from repo market seen as further regulatory fallout,* 16 August 2016, available https://www.pionline.com/article/20160816/ONLINE/160819924/jp-morgan-exit-from-repo-market-seen-as-further-regulatory-fallout.

Primary Dealers' Repo Agreements in the US as of 26 September 2018:[222]



Value of the Tri-Party Repo Market in the US as of October 2017:[223]



The situation in Europe is different. The European and British repo markets are more transparent because the ICMA European Repo and Collateral Council[224], the industry-driven initiative for repo dealers in the EU, has been gathering voluntary data since 2001 and has been publishing semi-annual surveys since then. The European market is divided into three segments, similarly to what happens in the United States. The first segment is an over-the-counter repo market, representing roughly half of the European

[222] The diagram is drawn from Financial Stability Oversight Council (FSOC), *Annual Report,* 2018, 44.
[223] The diagram is drawn from Financial Stability Oversight Council (FSOC), *Annual Report*, 2017, 51.
[224] *See* https://www.icmagroup.org/Regulatory-Policy-and-Market-Practice/repo-and-collateral-markets/.

market[225]. The second segment is a tri-party market, a smaller portion which accounts for one fifth of the market[226]. In the tri-party segment the clearing agent role is performed by a number of financial institutions, namely Clearstream in Luxembourg, Euroclear in Brussels, SIX in Zurich and the two biggest American clearing banks, Bank of New York Mellon and JPMorgan Chase. The third segment of the EU repo market has developed through anonymous electronic trading, in which repos are centrally cleared through Central Counterparty Clearing Houses (CCPs)[227]. CCPs are financial market infrastructures that imprint the repo market differently compared to the role of clearing banks in the triparty market, as they do become part of the transaction[228]. When the borrower and the lender mutually agree on the terms of the transaction, they ought to register with a CCP, which novates the contract and becomes the counterparty of each of the original parties (in other words, the buyer to the seller and the seller to the buyer or in other terms, the lender to the borrower and the borrower to the lender)[229].

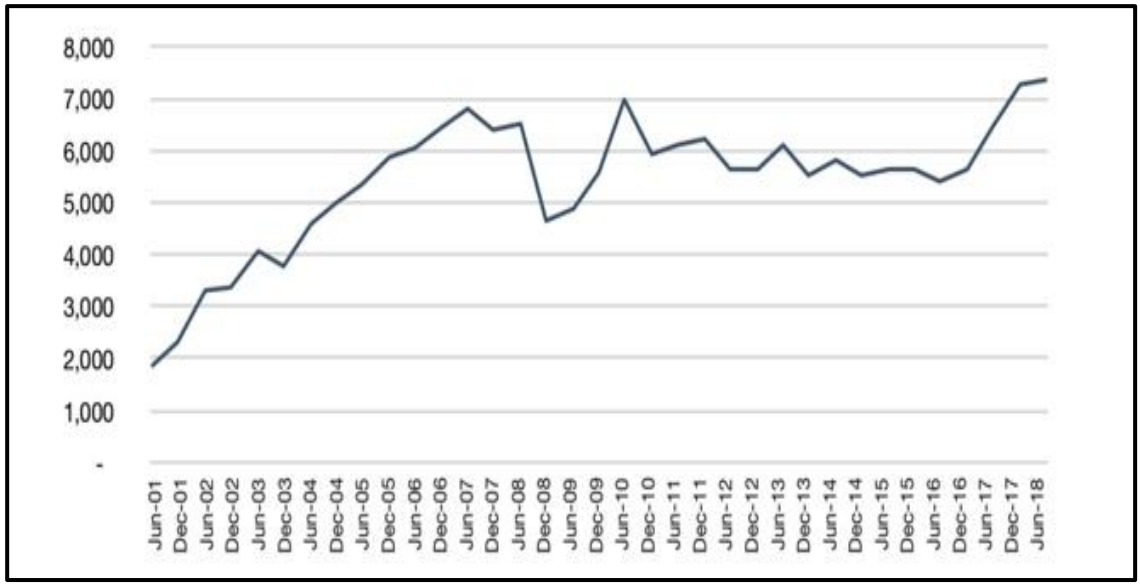
In addition, the infrastructure of the European market is different from the American one, as a consistent number of euro repo transactions are conducted in the interbank market (the European financial sector is a bank-based system). About 60% of these transactions occur through CCP-based electronic trading, meaning that a substantial part of European repo transactions is separate from the shadow banking system[230]. The EU and UK financial market infrastructures are also more consolidated than their American counterparts, with CCPs and electronic venues playing a pivotal role in European transactions. Finally, the triparty repo market is less dominant in Europe than it is in the US.

As for the actual size of the market, the European Repo and Collateral Council (ERCC) of the International Capital Market Association (ICMA) conducted its last semi-annual survey on the European repo market in June 2018, which was published in October 2018[231]. The survey asked 62 offices of fifty-nine financial groups, mainly banks, for the

[225] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 15.
[226] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 15.
[227] Among CCPS, the most important are LCH.Clearnet in London, LCH.Clearnet SA in France, Cassa di Compensazione e Garanzia (CC&G), part of the London Stock Exchange Group in Italy, Eurex Clearing (part of the Deutsche Borse Group) in Germany and Mercado Español de Futuros Financieros (MEFF) in Spain.
[228] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 18.
[229] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 16.
[230] L. Mancini, A. Ranaldo, J. Wrampelmeyer, *The Euro Interbank Repo Market,* Swiss Finance Institute Research Paper No. 13/71, 2016, 2.
[231] *See* International Capital Markets Association (ICMA), *European Repo Market Survey No. 35,* 2018.

value and breakdown of repo contracts on their trading books outstanding at the close of business on June 2018. The results showed that the total value of the repo contracts on the books of the participating institutions was EUR 7351 billions, a substantial increment from the EUR 6455 billions of June 2017 and EUR 7250 billions of December 2017, making it the largest figure ever recorded since the survey began in 2001, even exceeding the pre-crisis figures. According to the survey, *"the healthy growth of the European repo market seen in the previous survey was sustained in the first half of 2018. It would appear that the market has more or less fully adapted to recent waves of regulation and much of the business is returning to normal. This is most evident in the overall resurgence of electronic trading across automatic repo trading systems, particularly anonymous electronic business cleared across CCPs, which suggests a recovery in interdealer activity in contrast to the focus on the customer franchise that was indicated by previous surveys. Another factor behind the market's recovery may have been the reduction by the ECB of its Asset Purchase Programme (APP) announced in October with effect from January. One segment of the market that has not returned to any sort of historical normality is the tri-party repo"*[232].

The European total repo business in trillions as of June 2018:[233]



[232] International Capital Markets Association (ICMA), *European Repo Market Survey No. 35,* 2018, 5.
[233] The diagram is drawn from International Capital Markets Association (ICMA), *European Repo Market Survey No. 35,* 2018, 8.

1.8. *Contract formation: who's who in the world*

Before delving into the legal and economic structure of repurchase agreements contracting in the following chapter, it is worth noting the organizations involved in the process of repo contracts' formation. As a consequence of being largely conducted in the OTC market, repo transactions are concluded using standardized contractual models[234], published by the most important regional industry associations, namely the International Capital Market Association (ICMA), and its American counterpart, the Securities Industry and Financial Markets Association (SIFMA)[235]. These two organizations are involved in drafting and publishing the Global Master Repurchase Agreement (GMRA), the most commonly used standard repo agreement by the international practice. Originally, when repo markets appeared in international financial transactions, counterparties used to draft their own contractual models, but this led to disagreements, thus pushing for the need of standard agreements that could be better adopted in national and international transactions.

The International Capital Market Association, or ICMA[236], was founded in 1968, when the main firms in the Eurobond market created the Association of International Bond Dealers (AIBD), established in Zurich as an association under Swiss law (but as of 2017, ICMA is no longer subject to supervision in Switzerland). Eurobonds were created to borrow in US dollars while having a place of business outside the US, in order to avoid US tax regulations, but this itself introduced new problems with settlement and regulation across different jurisdictions, so representatives of banks and securities firms felt the need of a new industry-driven association that could set standards for the stability of the international capital market. In 1988, the Secretary of State for Trade and Industry in the UK approved AIBD as an "International Securities Self-Regulating Organization"

[234] The most famous standard agreement for financial transactions is the ISDA Master Agreement, published by the International Swaps and Derivatives Association (ISDA). It is the most commonly used master service agreement for OTC derivatives transactions at international level, *see* https://www.isda.org/book/2002-isda-master-agreement-english/.

[235] ICMA and SIFMA are not the only industry associations involved in the drafting of model contracts, but since the present research is focusing on the European and American markets from a global perspective, the two stand out among the others for their influence at international level. For instance, just to mention a few, the Association of German Banks (*Bundesverdban deutscher Banken*) drafts a standardised repo contract for the German market, the *deutscher Rahmenvertrag für Wertpapierpensiongeschäfte (Repos)* available at: http://en.bankenverband.de; the European Banking Federation (EBF) provides a European Master Agreement (EMA) for financial transactions to be used in the European market, available at https://www.ebf.eu/home/european-master-agreement-ema/; the National Association of Financial Market Institutional Investor (NAFMII) has drafted a Bond Repurchase Agreements (translated into English for international investors) to be used in the Chinese market, available at http://www.nafmii.org.cn/english/.

[236] All the information regarding ICMA are drawn from its website, *see* https://www.icmagroup.org.

(ISSRO) for the purposes of the Financial Services Act of 1986 and recognized it as Designated Investment Exchange[237]. The British subsidiary served as a new data service provider for the market and, accordingly, TRAX, a transaction matching, confirmation and regulatory reporting system, was launched by AIBD in 1989. In 1992, AIBD published the first version of the Global Master Repurchase Agreements. As of 1 January 1992, AIBD changed its name to "International Securities Market Association" (ISMA). In 2005, ISMA and the International Primary Market Association (IPMA)[238] merged. As a result, the association changed its name to "International Capital Market Association" (ICMA). Despite its name, it has a focus on the European scenario. In the following years, ICMA developed working relationships with other associations, pursuing informal cooperation on regulatory policy work and cooperating with local trade associations worldwide. Membership has been extended to asset and fund managers as well as insurance companies, opening associate membership also to professional advisers, such as law firms and accountants.

As for the international repo market, the ICMA European Repo Council (ERC) was established in December 1999, to represent the cross-border repo market in Europe. In 2015, the ERC's name was changed to European Repo and Collateral Council (ERCC). According to its website, "*the ICMA ERCC is today the main industry representative body for repo and collateral markets, developing consensus solutions for issues arising in a rapidly evolving marketplace and consolidating and codifying best market practice. The Council also plays a significant role in nurturing the development of the repo market and supporting its wider use in Europe and globally by providing educational courses and market information, such as the bi-annual survey of the European repo market which has become established over the past two decades as the authoritative indicator of market size and structure and the dominant trends".*

Today, ICMA is a self-regulatory organization and trade association for market participants, headquartered in Zurich (with additional offices in London, Paris and Hong Kong). It has more than 530 members located in 60 different countries, with the mission "*to promote resilient and well-functioning international debt capital markets, which are necessary for economic growth".*

Across the Atlantic, the Securities Industry and Financial Markets Association, or SIFMA[239], is the US industry trade group for banks, securities firms and asset managers.

[237] A designated investment exchange is nominated by the issuer of a security as the exchange on which their security will be traded.
[238] IPMA was founded in 1984 to provide recommendations for the primary capital market.
[239] All the information regarding SIFMA are drawn from its website, *see* https://www.sifma.org.

It resulted from the merger of the Bond Market Association (TBMA) and the Securities Industry Association in 2006, those formerly representing the sellers of stocks and bonds, creating what is now "*a lobbying powerhouse"*[240] in the American financial sector. It has offices in New York City and Washington D.C. Each year SIFMA publishes a US Repo Market Fact Sheet, providing measurement and trends of the American repo market[241]. In conjunction with ICMA, SIFMA has developed the first version of the GMRA, followed by additional revised versions in 1995, 2000 and 2011. In addition, SIFMA has published the 1996 Master Repurchase Agreement (MRA), the most important standard document used for repo transactions among US counterparts.

[240] The Washington Post, *Merger of Wall Street Groups Creates a Lobbying Powerhouse,* November 2006, available at http://www.washingtonpost.com/wp-dyn/content/article/2006/11/26/AR2006112600647.html.
[241] The 2017 US Repo Market Fact Sheet is available at https://www.sifma.org/resources/research/us-repo-market-fact-sheet-2017/.

CHAPTER II

THE LEGAL AND ECONOMIC STRUCTURE OF REPURCHASE AGREEMENTS

2.1. *The legal and economic nature of repo*

Repurchase agreements have a peculiar and complex legal construct. Most of the difficulties in determining a clear legal framework come from the repo being defined as a "sale and repurchase of the underlying security". However, from a substantive perspective, repos are similar to secured loans disguised as a sale[1]. A legal analysis of repurchase agreements requires a definition of the contractual transaction underlying these contracts[2]. A repo is a form of short-term secured debt collateralized by financial assets[3]. It may be functionally deemed as a form of secured lending, but it comes to be structured as a sale and subsequent repurchase of an underlying asset[4].

[1] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 2015, LSE Legal Studies Working Paper 21, 2015, 2.

[2] In the interests of providing fuller information, it is worth mentioning the definition of a repo transaction provided by Section 1 (a) of the 2011 Global Master Repurchase Agreement: "*From time to time the parties hereto may enter into transactions in which one party, acting through a Designated Office, ("Seller") agrees to sell to the other, acting through a Designated Office, ("Buyer") securities or other financial instruments ("Securities")* [...] *against the payment of the purchase price by Buyer to Seller, with a simultaneous agreement by Buyer to sell to Seller Securities equivalent to such Securities at a date certain or on demand against the payment of the repurchase price by Seller to Buyer".*

[3] Therefore, a repurchase agreement is in essence much like a short-term interest-bearing loan against specific collateral, *see* M. Stockley, *Understanding Repurchase Agreements,* 2012, available at https://www.treasury-management.com/index.php.

[4] J. Armour, D. Awrey, P. Davies, L. Enriques, J. N. Gordon, C. Mayer, J. Paine, *Principles of Financial Regulation,* Oxford, Oxford University Press, 2016, 452.

A basic repo may be chronologically viewed as a two-leg bilateral contract[5], where a sale of securities on an initial date is coupled with the commitment by the seller to repurchase the same quantity of *equivalent securities*, which are both object of the contract and underlying collateral posted in the transaction[6]. "Equivalent securities" has to be intended in the sense that securities have to be economically but not legally identical, which means they have to be fungible with those transferred[7]. In other words, securities have to be of the same type and issue, but do not need to be the very same identically numbered securities, given the fact that the recipient might as well have sold them due to the fact that the legal title has passed[8]. More specifically, in the first leg (opening leg) of the transaction, one counterparty (the seller/borrower) transfers securities to another counterparty (the buyer/lender) in exchange for cash, at a fixed time and at prespecified price[9]. The price to be paid in exchange for collateral is calculated at a discount rate (called "haircut") from the assets' fair market value[10]. The second leg (closing leg) of the transaction is a simultaneous agreement whereby the buyer (the lender) agrees to sell the securities back to the seller (the borrower) and the latter agrees to repurchase them at a future date or on demand[11]. The difference between the price of the first leg and the (higher) price of the second leg represents the interest charged to the transaction and comes to be called the "repo rate"[12]. This repo rate, which is expressed in percentage points, should reflect the quality and liquidity of the collateral and the overall the riskiness of the transaction. The repo price is a key distinguishing feature of repo transactions, because it is not a function of the market value of the securities at the original purchase date nor it is a forward price of the securities at the purchase date[13]. Instead, the price is a function of the original purchase price plus a financing cost element, known as the "repo rate", thus differentiating repo from a traditional combination of a spot (*i.e.* immediate

[5] When the parties enter into this two-folded transaction, the sale of securities can be intended for immediate settlement but also for settlement on the forward start date if it is forward-starting, *see* C. Georgiou, J. Haines, *Understanding Repo and the GMRA,* Apollo Legal/Ashurst/ICMA, 2017, 1.
[6] R. Perotti, *The Repo Market,* 2016, 1, available at http://rp.rperotti.com.
[7] C. Georgiou, J. Haines, *Understanding Repo and the GMRA,* 23.
[8] C. Georgiou, J. Haines, *Understanding Repo and the GMRA,* 23.
[9] J. Armour, D. Awrey, P. Davies, L. Enriques, J. N. Gordon, C. Mayer, J. Paine, *Principles of Financial Regulation,* 453. *See also,* P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 27. The borrower may then use the cash for different purposes, such as buying financial assets or pay liabilities, as we will see in Chapter III.
[10] J. Armour, D. Awrey, P. Davies, L. Enriques, J. N. Gordon, C. Mayer, J. Paine, *Principles of Financial Regulation,* 454.
[11] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 27.
[12] R. Perotti, *The Repo Market,* 1.
[13] C. Georgiou, J. Haines, *Understanding Repo and the GMRA,* 1.

settlement) and a forward (*i.e.* immediate agreement but future settlement) transaction[14]. The typical maturity, *i.e.* the final payment date at which principal and interests are due to be paid, is very short, usually overnight, but parties may agree on different arrangements[15].

The analysis should proceed to investigate the differences in the legal construct of repos between the two shores of the Atlantic. Understanding the divergent legal mechanics is not only relevant from a theoretical standpoint but it also affects the way the market is structured and how operations with repos are conducted in different jurisdictions[16]. Against this backdrop, it can be preliminary noted that due to its simple legal structure repo transactions are accepted in both common law and civil law jurisdictions[17], but a comparative survey of the contractual scheme shows that its legal construction is essentially different in Europe (including the UK) and in the USA, the most diverging feature lying in collateral management[18].

In Europe[19], the legal title of collateral is transferred from the seller to the buyer of the securities by means of an outright transfer of legal ownership, thereby making the European repo transaction a true sale[20]. During the life of the repo, the buyer holds legal title to the collateral and is therefore entitled to any ownership-related benefits, including

[14] C. Georgiou, J. Haines, *Understanding Repo and the GMRA,* 1. A spot transaction is a contract of buying or selling something, *e.g.* a security, for immediate settlement on the spot date, usually after two days after the trade. A forward transaction is a contract in which terms are agreed now but settlement will occur at a future date, *see* S. Valdez, P. Molyneux, *An Introduction to Global Financial Markets,* London, Macmillan Palgrave, 2016, 498-504.

[15] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 30.

[16] In Italy, for instance, the repurchase agreement (so called *pronti contro termine*) is traditionally concluded through two different sales contracts, a spot contract (*contratto a pronti)* and a forward contract (*contratto a termine)* that are linked by the same contractual object and through an economic link. Nevertheless, Italian authors have expressed many diverging opinions on the legal nature of *pronti contro termine,* so that is not easy to find a correct answer. *See* M. Tola, *Pronti Contro Termine,* Milano, 2013, 99 ff; A. Di Amato, *Il Contratto di Pronti Contro Termine,* in E. Gabrielli (ed.), *Commentario del Codice Civile. Dei singoli contratti. Leggi Collegate,* Milano, 2011, 109 ff.

[17] S. Wu, H. Nabilou, *Repo Markets across the Atlantic: Similar but Unalike,* Forthcoming European Business Law Review, 2019, 5, available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3165720.

[18] S. Wu, H. Nabilou, *Repo Markets across the Atlantic: Similar but Unalike,* 4.

[19] Curiously, the oldest legal analysis on the nature of repos began in Italy in the XIX century and the Italian civil law tradition had much influence on Spanish, French and especially Latin American scholars. Thus, it is not by chance that Italian bankers were already familiar with repo contracts when they started to gain importance in the international framework. Also, as we've seen in Chapter I, the Italian repo market is one of the oldest in Europe. Notwithstanding this significant legal debate, the actual repo contract does not find its roots in these scholarly debates, so that legal tradition has no impact on the current Italian, French or Spanish repo markets. *See* J. R. Martinez-Resano, *Repo Markets,* The World Bank Gemloc Advisory Services Program, 2010, 59. *See also,* for an extremely detailed comparative analysis of the evolution and interpretation of the legal nature of similar contracts in different jurisdictions, J. Dalhuisen, *Dalhuisen on Transnational Comparative, Commercial, Financial and Trade Law Vol. 2,* Oxford, Hart Publishing, 2016, 511 ff.

[20] R. Perotti, *The Repo Market,* 2. The transfer of collateral is crucial because it avoids having to join insolvency proceeding in case of a party's default, by managing the default process according to the contractual terms set in the GMRA.

coupons and dividends that may be paid by the issuer of the collateral[21]. At the same time, the seller retains the risk on the collateral as she agrees to buy it back. The seller would not accept this risk without a certain return, consisting of coupons and dividends. Therefore, the buyer generally agrees to satisfy the seller by paying compensatory amounts equivalent to any income payments received on the collateral, which are called "manufactured payments"[22]. Any income payments generated by the collateral shall go to the seller, although they are materially delivered to the buyer as the legal owner at the time of payment[23]. In addition, manufactured payments are due even if the securities have been sold or rehypothecated to a third party, because the buyer only has to return equivalent securities[24]. Overall, in such transaction structure, both market risk and any rewards associated with the ownership of the assets are with the original owner while outright ownership is temporarily transferred to the buyer[25].

In Europe, because a repo transaction involves the transfer of securities from one party to another, the 2002 Financial Collateral Directive (FCD)[26] applies. The FCD provides for three different ways of delivering securities[27]:

(i) "title transfer financial collateral arrangement" ("TTCA"), implying transfer of the full legal title to the securities[28];

(ii) "security financial collateral arrangement" - *i.e.* delivery of the securities under a security interest without transferring full title, for instance thorough a pledge arrangement[29];

[21] R. Comotto, *Frequently Asked Questions on Repo,* International Capital Market Association, 2015, 20.
[22] C. Georgiou, J. Haines, *Understanding Repo and the GMRA,* 49.
[23] C. Georgiou, J. Haines, *Understanding Repo and the GMRA,* 49.
[24] See Section 5 of the 2011 GMRA. For a definition of what is treated as income, *see* Section 2, paragraph 2 (y): *"all interest, dividends or other distributions thereon, including distributions which are a payment or repayment of principal in respect of the relevant securities".*
[25] C. Georgiou, J. Haines, *Understanding Repo and the GMRA,* 49-52. In case of equity, voting rights and corporate bonds may be transferred with the legal ownership to the buyer, *see also* R. Comotto, *Frequently Asked Questions on Repo,* 20.
[26] Directive 2002/47/EC of the European Parliament and of the Council of 6 June 2002 on financial collateral arrangements.
[27] P. Paech, *Shadow Banking: Legal Issues of Collateral Assets and Insolvency Law,* European Parliament Directorate General for Internal Policies, Policy Department A: Economic and Scientific Policy, 2013, 21.
[28] Directive 2002/47/EC Article 2 paragraph 1 a) - b): *"financial collateral arrangement" means a title transfer financial collateral arrangement or a security financial collateral arrangement whether or not these are covered by a master agreement or general terms and conditions*; *"title transfer financial collateral arrangement" means an arrangement, including repurchase agreements, under which a collateral provider transfers full ownership of financial collateral to a collateral taker for the purpose of securing or otherwise covering the performance of relevant financial obligations.*
[29] Directive 2002/47/EC Article 2 paragraph 1 c): *"security financial collateral arrangement" means an arrangement under which a collateral provider provides financial collateral by way of security in favor of, or to, a collateral taker, and where the full ownership of the financial collateral remains with the collateral provider when the security right is established.*

(iii) delivery of securities allowing for a "right of use" while retaining full title (however, should the securities be reused the arrangement transforms into a title transfer)[30].

Repurchase agreements transactions in Europe are mostly concluded with the TTCA, because this method would better fit the intended purposes of the parties. The securities are transferred from the original owner to the buyer, so that the latter becomes full owner of the relevant securities and the former receives a contractual claim for re-transfer of equivalent assets[31]. When the contract is concluded, the buyer has full right to disposal over the collateralized securities and may sell them, transfer them to others as collateral or even re-collateralize them[32]. If the seller defaults, failing to repurchase the securities at the termination date, the buyer keeps the ownership of the securities, having the option to sell them in order to cover losses arising from the defaulted transaction[33].

Albeit sharing the feature of being considered a true sale under a legal perspective, European repo transactions may be subject to specific provisions of the laws of Member States, thus representing a possible source of contractual inconsistency and legal conflict[34]. In order to mitigate these potential inconsistencies, the Financial Collateral Directive and the Settlement Finality Directive[35] include certain bankruptcy safe harbors (*see infra para. 2.2*), which deal with treatment of repo transactions in insolvency proceedings. Over time, these differences triggered industry-driven initiatives to lay the foundations of a harmonized governance and design of repurchase agreements, namely adopting a General Master Repurchase Agreement ("GMRA") - *see infra para. 2.5.* -

[30] Directive 2002/47/EC Article 5: "*Right of use of financial collateral under security financial collateral arrangements": If and to the extent that the terms of a security financial collateral arrangement so provide, Member States shall ensure that the collateral taker is entitled to exercise a right of use in relation to financial collateral provided under the security financial collateral arrangement. Where a collateral taker exercises a right of use, he thereby incurs an obligation to transfer equivalent collateral to replace the original financial collateral at the latest on the due date for the performance of the relevant financial obligations covered by the security financial collateral arrangement. Alternatively, the collateral taker shall, on the due date for the performance of the relevant financial obligations, either transfer equivalent collateral, or, if and to the extent that the terms of a security financial collateral arrangement so provide, set off the value of the equivalent collateral against or apply it in discharge of the relevant financial obligations. [...].*

[31] P. Paech, *Shadow Banking: Legal Issues of Collateral Assets and Insolvency Law,* 21. The author points out that this is the easier way of structuring a repo transaction and actually the majority of repos are in the form of TTCAs, but theoretically it would be legally possible to secure the cash loan by a charge or pledge over the securities through a security interest. In this scenario, the original owner would remain the legal owner and the counterparty would have a weaker right (comparable to possession) over the securities.

[32] C. Georgiou, J. Haines, *Understanding Repo and the GMRA,* 4.

[33] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 2015, 28.

[34] S. Wu, H. Nabilou, *Repo Markets across the Atlantic: Similar but Unalike,* 6.

[35] Directive 98/26/EC of the European Parliament and of the Council of 19 May 1998 on settlement finality in payment and securities settlement systems.

under the auspices of the International Capital Market Association, which is governed by English (or sometimes Welsh law).

In the United States, New York law (the predominant jurisdiction for American repo transactions) makes it difficult to transfer legal title to collateral. Therefore, the collateral is pledged but simultaneously exempted from the automatic stay on enforcement of collateral required under the US Bankruptcy Code that would normally apply to pledges[36]. Automatic stays are statutory safeguards that prevent creditors from undertaking actions to close-out their contracts with the debtor, forcing creditors' participation in the collective process of insolvency[37] (*see infra para. 2.2.*). Instead, the US repo is constructed in such way that in the event of a party's insolvency, the counterparty holding the securities may liquidate them and accelerate or terminate the agreement[38]. Moreover, the buyer ("pledgee") in a US repo has the right to use the collateral through rehypothecation,[39] which is the use of pledged collateral as collateral in another transaction[40]. Because of rehypothecation, the transaction effectively achieves the same economic outcome of an outright sale[41]. Against this backdrop, there is a legal distinction between the American rehypothecation and the right of use of collateral in non-US repo markets[42]. In the US, since the collateral is pledged, title to collateral effectively remains with the collateral-giver[43]. If the latter grants a right of rehypothecation to the collateral-taker, the collateral-giver still remains the owner until the collateral-taker actually exercises her right of rehypothecation[44]. When the right is exercised, the legal title to collateral will be transferred to the third party to whom the collateral has been rehypothecated and the collateral-giver will remain with a contractual right to the return of fungible assets[45]. In addition, New York law provides for a fall-back provision in the event a buyer's rights to collateral is not to be enforceable in law, leading to a recharacterization of repo as secured lending[46]. Such fall-back is not allowed under

[36] R. Perotti, *The Repo Market,* 2.
[37] S. J. Lubben, *Repeal the Safe Harbors,* 18 American Bankruptcy Institute Law Review, 2010, 323.
[38] R. Perotti, *The Repo Market,* 2; *see also* K. Garbade, *The Evolution of Repo Contracting Conventions in the 1980s,* in 12(1) Federal Reserve Bank of New York Economic Policy Review, 2006, 30 for an historical perspective on property rights to repo securities and how repo creditors became allowed to sell the securities during the term of the repo.
[39] R. Comotto, *Frequently Asked Questions on Repo,* 10.
[40] R. Comotto, *Frequently Asked Questions on Repo,* 10.
[41] S. Wu, H. Nabilou, *Repo Markets across the Atlantic: Similar but Unalike,* 6.
[42] R. Comotto, *Frequently Asked Questions on Repo,* 11. Also, regulation of rehypothecation differs in the US and in Europe, as we will address in the last Chapter, *see* S. Wu, H. Nabilou, *Repo Markets across the Atlantic: Similar but Unalike,* 13 ff.
[43] R. Comotto, *Frequently Asked Questions on Repo,* 11.
[44] R. Comotto, *Frequently Asked Questions on Repo,* 11.
[45] R. Comotto, *Frequently Asked Questions on Repo,* 11.
[46] R. Comotto, *Frequently Asked Questions on Repo,* 10.

English law or EU law (nor under the Financial Collateral Directive[47]). Despite the aforementioned legal characterization being accepted in the literature, American authors and courts have overtime times discussed about the legal nature of the repo construction. There is a long-standing dispute as to how repos should be characterized from a legal standpoint and what are the consequence of such characterization for this multi-trillion-dollar market[48].

From an economic point of view, a repo is functionally equivalent to a secured loan, in which a borrower pledges an asset as collateral for the loan (which then becomes a secured debt), because it combines the sales of securities with the contextual agreement to repurchase the same assets[49]. However, repo transactions constitute secondary market trade in securities, or as for the case of money market transactions, short-dated cash transactions, similar in nature to certificates of deposits (CD), Treasury bills (T-Bills), commercial paper and floating rate notes (FNR)[50]. Repo transactions can also be seen as "hybrid" transactions carrying features of both categories, depending on whether the cash leg or the securities leg of the transaction mentioned above is dominant for the purposes of the parties[51]. Finally, more structured repo transactions may also be economically seen as financings or even derivatives[52]. When considering the economic nature of repo transactions, the first feature to emerge is an apparent paradox whereby a seller gives full legal ownership to a buyer for the term of the repo but does not transfer the risk and return on the assets: this entails that if the value of the collateral falls down the seller would suffer a loss[53]. This paradox is the direct result of the seller's commitment to repurchase the collateral on a specific date for a fixed price that equals the purchase price plus a return on the use of the buyer's cash[54]. As argued above, as a consequence of its risk-

[47] Under the FCD, there is a clear distinction between pledge and title transfer, leading to the enforcement through a sale in case of a pledge and appropriation of full title in case of title transfer, thus avoiding recharacterization both at the time of perfection and enforcement, *see* J. Dalhuisen, *Dalhuisen on Transnational Comparative, Commercial, Financial and Trade Law Volume. 2,* Oxford, Oxford University Press, 2016, 717.
[48] J. Schroeder, *Repo Madness; the Characterization of Repurchase Agreements under the Bankruptcy Code and the U.C.C.,* 46 Syracuse Law Review, 1996, 1008.
[49] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 30.
[50] C. Georgiou, J. Haines, *Understanding Repo and the GMRA,* 4.
[51] C. Georgiou, J. Haines, *Understanding Repo and the GMRA,* 4.
[52] C. Georgiou, J. Haines, *Understanding Repo and the GMRA,* 4. The vast majority of the literature covering financial markets do not consider or treat repo as a derivative contract, but rather as a money market instrument. For a dissenting opinion *see* P. Faure, *Is the repo a Derivative?,* 2(2) African Review of Economic and Finance, 2011, 194 ff., in which the author sustains that repo should be regarded as derivative because is derived from an existing financial market instrument, *i.e.* the underlying instrument, and takes its value from another segment of the financial market.
[53] Euroclear, *Understanding Repo and the Repo Market,* 2009, 22.
[54] Euroclear, *Understanding Repo and the Repo Market,* 22.

bearing, the seller is entitled to receive the return on the collateral in compensation, but this can happen in two ways:

(i) the return is paid automatically to the seller in the case of accrued interest on a coupon-bearing bond used as collateral;

(ii) if the coupon is paid during the term of the repo, the return is actually payed directly to the buyer who has a contractual obligation to make an equivalent payment to the seller[55].

The specifics of risk management and the possible risk mitigants available to the parties, such as close-out netting, haircuts and margin, are going to be fully address in Chapter III, together with the functioning and application of repos (*see infra para. 3.2.*). For the time being suffice it to say, because it will be recurrent in the following paragraphs, that netting indicates the process of off-setting mutual obligations between two parties to calculate a net claim or obligation[56].

2.1.1. *Recharacterization risk*

Recharacterization is a term used by scholars and practitioners to indicate the risk of a transaction being treated by the courts as something different from what the parties originally intended. This risk in our analysis is the risk of a title transfer arrangement to be treated as a grant of security interest[57]. This may occur because, as argued above, repos are substantially equivalent to secured loans as they both are financing arrangements characterized by a number of similarities[58]. For example, the buyer under a repo is advancing funds to the seller in the same way a lender under a secured loan would do in return for securities[59]. Moreover, in both cases, the party seeking to obtain new funds transfers to the other party an interest in an identified property[60]. In both cases, the

[55] Euroclear, *Understanding Repo and the Repo Market,* 22.
[56] International Capital Market Association, *A Guide to Best Practice in the European Repo Market,* 2017, 108.
[57] C. Georgiou, J. Haines, *Understanding Repo and the GMRA,* 125. *See also,* J. Dalhuisen, *Dalhuisen on Transnational Comparative, Commercial, Financial and Trade Law Volume 2,* 519 ff.; W. Hagerty, *Lifting the Cloud of Uncertainty over the Repo Market: Characterization of Repos as Separate Purchases and Sales of Securities,* 37 Vanderbilt Law Review, 1984, 401 ff.; G. Siegel, *Retail Repurchase Agreements: Overcoming Insecurity within the Securities Laws,* 2 Annual Review of Banking Law, 1983, 257 ff.
[58] J. Schroeder, *Repo Redo: Repurchase Agreements After the Real Estate Bubble*, Cardozo Legal Studies Research Paper No. 360, 2012, 2.
[59] A. Duncan, R. Cannon, *Repos of Loans - Now Possible,* 1, available at https://www.cadwalader.com/uploads/books/105f9f59f9b4806acab6368322ebbb31.pdf.
[60] A. Duncan, R. Cannon, *Repos of Loans - Now Possible,* 1.

financed party is required to pay an amount at least equivalent to the original amount to the financing party[61]. Upon payment the financing party under a secured loan is required to transfer property to the financed party; similarly, a repo seller is contractually obliged to repurchase its property just as a debtor is contractually obliged to repay its secured loan. Finally, in both cases if the financed party breaches its obligation to repay the financing party, the latter has the right to sell the transferred property on the market[62]. However, repo transactions may be deemed as more advantageous. The buyer may sell the assets in the meantime, provided it acquires and sells an equivalent financial asset on the repurchase date, whereas a lender with security cannot sell until the security becomes enforceable after a default[63]. Moreover, failure to pay the repurchase price on the repurchase date allows the buyer to immediately sell the collateral, realize the proceeds and possibly claim against the seller for any deficiency[64]. Finally, as a repo does not create security, no registration needs to be made (while for instance under English law a security granted by a company would need to be registered within twenty-one days at a Companies House)[65].

Under US law, if repurchase agreements were to be considered disguised secured transactions, then Article 9 of the Uniform Commercial Code (UCC)[66] would apply as this article covers all transactions intended to create security interest in personal property, in spite of the actual form adopted by the parties[67]. If that was the case, there is consensus among US commercial lawyers that characterizing repo contracts as security interests would have disastrous effects on the financial industry[68]. In such a case, in fact, remedies of article 9 UCC would apply, so that in case of a breach of the seller's obligation to repurchase the securities, the buyer would need to sell the securities in a foreclosure sale

[61] A. Duncan, R. Cannon, *Repos of Loans - Now Possible,* 1.
[62] A. Duncan, R. Cannon, *Repos of Loans - Now Possible,* 1.
[63] A. Duncan, R. Cannon, *Repos of Loans - Now Possible,* 1.
[64] A. Duncan, R. Cannon, *Repos of Loans - Now Possible,* 1.
[65] A. Duncan, R. Cannon, *Repos of Loans - Now Possible,* 1.
[66] Article 9 of the Uniform Commercial Code governs a type of property interest, namely the security interest, laying the rules for effective creation, enforceability and priority of such interests, *see* H. Hughes, *Property and the True Sale Doctrine,* 19 (4) University of Pennsylvania Business Law Review, 2017, 919. More specifically, *see* G. McCormack, *Secured Credit under English and American Law,* Cambridge, Cambridge University Press, 2004, 70 ff., hereby summed as follows: Article 9 adopts a universal, unitary concept of security interest. The scope of its application is to apply to any transaction, regardless of its form, that creates a security interest in personal property or fixtures by contract and to a sale of accounts, chattel paper, payment intangibles or promissory notes. Security interest is therein defined as an interest in personal property or fixtures that secures either payment or else the performance of an obligation. Its scope is broad enough to encompass any functionally equivalent legal devices, for example transactions that do not involve the creation of security but nevertheless, in economic terms, serve the same financing purpose.
[67] J. Schroeder, *A Repo Opera: How Criimi Mae Got Repos Backwards,* 76 American Bankruptcy Law Journal, 2002, 572.
[68] J. Schroeder, *A Repo Opera: How Criimi Mae Got Repos Backwards,* 565. We have to remind that the Fed strongly relies on the presence of a market in repos as a tool for monetary policy.

and then return to the debtor any monetary surplus from the market value obtained from this sale[69]. Accordingly, lawyers drafting repos avoid the language of secured lending and call their transaction by another name, such as sale[70]. American judges have generally been keen to market needs and have often argued that repo transactions are functionally separate from secured loans, showing not only judicial sympathy for the parties' own self-serving characterization, but even refusing to enter into any recharacterization process of complex financial products[71].

English law is not exempt from such risk. Under English law certain security interests require registration and are void against a liquidator of the chargor on its insolvency if such registration did not occur[72]. The risk derives from the requirement to register a security interest under the Companies Act of 2006[73]. Potentially, if an English court would rule that a repo should be recharacterized as a loan, the seller being an English company, then the security would not be effective because it would have not been registered with the Companies House[74]. As a result, the buyer would only have an unsecured claim against the seller for the repurchase price[75]. But like American judges,

[69] J. Schroeder, *Repo Madness; the Characterization of Repurchase Agreements under the Bankruptcy Code and the U.C.C.,* 1008. Other consequences may be that if the repo seller were an entity subjected to bankruptcy, repos would have to be perfected to avoid the trustee's powers of a judicial lien creditor under state law. Also, payments made by a repo seller within ninety days of the repo seller's bankruptcy would be vulnerable to avoidance by the seller's trustee as a preference. Of course, these are consequences related to issues dealing with debtor-creditor law purposes, but parallel issues arise under tax and securities law. For tax issues, *see* W. Chip, *Are Repo Really Loans?,* Tax Notes, 2002, 1056 ff., available at https://www.cov.com/~/media/files/corporate/publications/2002/05/are-repos-really-loans.pdf. For securities issues, *see* K. Kettering, *Repledge and Pre-Default Sale of Securities Collateral under Revised Article 9,* 74 Chicago-Kent Law Review, 1999, 1109 ff.; H. Schatz, *The Characterization of Repurchase Agreements in the Context of the Federal Securities Laws,* 61 St. John's Law Review, 1987, 290 ff.; K. Kettering, *True Sale of Receivables: a Purposive Analysis,* 16 American Bankruptcy Institute Law Review, 2008, 511 ff.; M. Spielman, *Wholesale Loan Repurchase Agreements: an Assessment of Investment Transaction Risks in Light of Continuing Legal Uncertainty,* 99 Commercial Law Journal, 1994, 476 ff.; J. Dalhuisen, *Dalhuisen on Transnational Comparative, Commercial, Financial and Trade Law Volume 2,* 519 ff.

[70] J. Schroeder, *Repo Redo: Repurchase Agreements After the Real Estate Bubble*, 3.

[71] J. Schroeder, *A Repo Opera: How Criimi Mae Got Repos Backwards,* 565. This could be of some surprise, as generally in commercial law substance governs over form.

[72] C. Georgiou, J. Haines, *Understanding Repo and the GMRA,* 125. There is no statutory definition of security interest in the UK and one must look at judicial interpretation. By contrast, Article 1(37) of the Uniform Commercial Code defines a security interest as an interest in personal property that secures either payment of money or the performance of an obligation or the interest of a buyer of accounts, *see* G. McCormack, *Secured Credit under English and American Law,* 1.

[73] C. Georgiou, J. Haines, *Understanding Repo and the GMRA,* 130. Specifically, under section 860 of the UK Companies Act 2006, charges over securities are not registrable unless they are floating charges, charges on book debts or charges to secure an issue of debentures, *see* K. Ong, E. Yeung, *Repos & Securities Lending: the Accounting Arbitrage and their role in the global financial crisis,* 6 (1) Capital Markets Law Journal, 2010, 94.

[74] A. Duncan, R. Cannon, *Repos of Loans - Now Possible,* 1.

[75] A. Duncan, R. Cannon, *Repos of Loans - Now Possible,* 1. The essential difference between a loan and a sale were set out in *Re George Inglefield Limited:* (i) in a transaction of sale, the vendor is not entitled to get back the subject-matter of the sale by returning the money that has passed between them, while in case of a mortgage or charge, the mortgagor is entitled to get back the subject-matter by returning the money that has passed between them; (ii) obligation on the mortgagee to account to the mortgagor for any surplus

English courts generally characterize a contractual document based on the parties' actual will[76]. English law is particularly relevant in this respect as the GMRA is generally governed by it. In fact, the GMRA contains provisions in order to avoid - or at least reduce - the risk of recharacterization by including a number of interpreting provisions[77]. Namely, paragraph 6 (f) of the 2011 GMRA states that: "*Notwithstanding the use of expressions such as "Repurchase Date", "Repurchase Price", "margin", "Net Margin", "Margin Ratio" and "substitution", which are used to reflect terminology used in the market for transactions of the kind provided for in this Agreement, all right, title and interest in and to Securities and money transferred or paid under this Agreement shall pass to the transferee upon transfer of payment, the obligation of the party receiving Purchased Securities or Margin Securities being an obligation to transfer Equivalent Securities or Equivalent Margin Securities".* Moreover, repo transactions conducted through the GMRA also enjoy the additional protection granted by the Financial Collateral Arrangements (No.2) Regulations 2003/3226 (FCR)[78], but only if the repo transaction is structured as a title transfer collateral arrangement within the meaning of the FCR itself[79]. For a transaction to constitute a TTCA under the FCR the seller must transfer legal and beneficial ownership in financial collateral to the buyer, with the agreement that when the financial obligation is discharged the buyer must re-transfer legal and beneficial ownership of equivalent securities to the seller[80]. Accordingly, the FCR provides protection to financial collateral arrangements:

(i) by providing that a close out netting provision will take effect in accordance with its terms notwithstanding that the counterparty enters into insolvency proceedings;

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on realizing the subject matter of the mortgage; (iii) obligation on the mortgagor to account to the mortgagee for any shortfall on realizing the subject matter of the mortgage. Subsequently, in *Welsh Development Agency v Export Finance Co Limited* the use of these three criteria was rejected as the sole possible test and again the same rejection was affirmed in *Orion Finance Ltd v Crown Financial Management Ltd. See* C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 126; *also see* K. Ong, E. Yeung, *Repos & Securities Lending: the Accounting Arbitrage and their role in the global financial crisis,* 95-96.

[76] C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 125 ff. We have to point out that in some circumstances, the courts will actually give the transaction a different legal treatment and there two ways in which this might happen: (i) when there is a sham, that is when the legal documentation is intended to give the appearance of creating legal rights different from the ones the parties intend to create ; (ii) when the true character of the transaction differs from the label given to it.

[77] K. Ong, E. Yeung, *Repos & Securities Lending: the Accounting Arbitrage and their role in the global financial crisis*, 95.

[78] The UK legislation that implemented Directive 2002/47/EC of the European Parliament and of the Council of 6 June 2002 on financial collateral arrangements.

[79] C. Georgiou, J. Haines, *Understanding Repo and the GMRA,* 129. On the contrary, for a repo to constitute a security financial collateral arrangement under the FCR four criteria must be satisfied: (i) the purpose of the agreement must be to secure the relevant financial obligations owed to the collateral-taker; (ii) the collateral-provider must create a security interest in financial collateral to secure those obligations; (iii) the collateral has to be delivered, transferred, held registered or designated for the collateral-taker to gain possession; (iv) both parties must not be natural persons.

[80] C. Georgiou, J. Haines, *Understanding Repo and the GMRA,* 129.

(ii) by disapplying the requirement to register a security interest, so that if the transaction is eventually recharacterized as a loan coupled with a security interest, the security interest is not void for lack of registration[81]. However, as a matter of English law, the recharacterization of a sale under a GMRA transaction to a secured lending is unlikely to result in buyer's interest in securities becoming unenforceable against a liquidator[82]. Therefore, practically this risk should not be reason of major concern. Finally, it can be easily noted that the best way to avoid recharacterization risk is simply by means of appropriate contract drafting.

2.2. *Bankruptcy treatment in comparative perspective*

Many developed legal frameworks provide for creditor-friendly insolvency provisions applicable to repurchase agreement and derivatives in the event of insolvency or default of a financial institution[83]. As argued above, repurchase agreements are deeply intertwined with bankruptcy law provisions, especially in the US, where they are considered "Qualified Financial Contracts" (QFCs)[84]. Title II of the Dodd Frank Act Section 210(c)(8)(D), defines a QFC as *"a securities contract, commodities contract, forward contract, repurchase agreement, swap agreement, or any similar agreement that the Federal Deposit Insurance Corporation determines by regulation, resolution, or order to be a qualified financial contract"*. In particular, a repo under New York law is legally constructed as a pledge of collateral, and simultaneously exempted from certain bankruptcy debtor safeguards. In the US, Bankruptcy laws are federal laws contained in the United States Code, where they are included within Title 11 on Bankruptcy and may be applied both in a Chapter 7 Liquidation[85] and in a Chapter 11 Reorganization[86].

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[81] C. Georgiou, J. Haines, *Understanding Repo and the GMRA,* 129.
[82] K. Ong, E. Yeung, *Repos & Securities Lending: the Accounting Arbitrage and their role in the global financial crisis,* 94.
[83] P. Paech, *Repo and Derivatives Portfolios Between Insolvency Law and Regulation,* LSE Law, Society and Economy Working Paper No. 13, 2017, 4.
[84] S. Wu, H. Nabilou, *Repo Markets across the Atlantic: Similar but Unalike,* Forthcoming European Business Law Review, 2018, 8.
[85] P. Paech, *The Value of Insolvency Safe Harbours,* LSE Law, Society and Economy Working Paper No. 9, 2015, 8. Chapter 7 is the most common form of bankruptcy. If a debtor has assets not protected by an exemption, the court will appoint a trustee to sell them and distribute the net proceeds to creditors according to the priorities established in the Bankruptcy Code. The debtor gets a discharge of his personal liability for most debts, *see* https://www.bankruptcyinbrief.com/chapter7/.
[86] P. Paech, *The Value of Insolvency Safe Harbours,* 8. Chapter 11 is a form of bankruptcy reorganization available to individuals, corporations and partnerships, and it is usually chosen by large businesses seeking to restructure their debt. Under this procedure, the debtor remains in possession of its assets and operates

A key feature of the US Bankruptcy Code is the imposition of automatic stay when a firm is filing for bankruptcy[87]. Automatic stays are statutory safeguards that prevent creditors from undertaking actions to close-out their contracts with the debtor, forcing creditors' participation in the collective process of insolvency[88]. The underlying rationale for this stay is to prevent creditors from enforcing claims through means other than participating in the insolvency proceedings[89]. Stays are specifically designed to enhance the value of the debtor's estate through continued access to marketable securities in order to have an essential source of liquidity[90]. Accordingly, creditors are mandated to return assets they have previously collected if they can show a voidable preference, in order to facilitate the defaulting firm to generate revenue and maximize its economic value: this way, the firm it is not forced to liquidate assets to meet creditors' claims and may use available cash for operating expenses[91]. Creditors may negotiate with the debtor but may not terminate contracts, liquidate the collateral or engage in other collection activities without prior court approval[92]. When the Bankruptcy Code was enacted in 1978, repos and derivatives were treated like many others executory contracts and they were subject to the automatic stay[93]. After a number of legislative amendments[94], the US Bankruptcy

the business under the supervision of the court and for the benefits of the creditors, *see* https://www.bankruptcyinbrief.com/chapter-11-bankruptcy-explained/.

[87] Section 362 (a) of the US Bankruptcy Code. *See* F. Maclachlan, *Repurchase Agreements and the Law. How Legislative Changes Fueled the Housing Bubble,* 48 Journal of Economic Issues, 2014, 516.

[88] S. J. Lubben, *Repeal the Safe Harbors*, 323.

[89] F. Maclachlan, *Repurchase Agreements and the Law. How Legislative Changes Fueled the Housing Bubble,* 48 Journal of Economic Issues, 2014, 516. For instance, they could attempt to liquidate collateral in advance or try to enforce their claims before other courts. Also, automatic stay works by discouraging creditors from extending loans to bankruptcy-prone debtors, even if the collateral is of high value and by creating a more dependence in the creditor-debtor relationship, thus creating a more stable financial system.

[90] D. Duffie, D. Skeel, *A Dialogue on the Costs and Benefits of Automatic Stays for Derivatives and Repurchase Agreements,* Center for Corporate Governance at Stanford University Working Paper No. 108, 2012, 18.

[91] F. Maclachlan, *Repurchase Agreements and the Law. How Legislative Changes Fueled the Housing Bubble,* 516. Note that the automatic stay also shifts some of the bankruptcy costs to the creditors themselves, therefore they are incentivized to prevent bankruptcy from happening in the first place. *See also* E. Warren, *Chapter 11: Reorganizing American Businesses. The Essentials*, New York, Aspen Publishers, 2008, 98.

[92] D. Duffie, D. Skeel, *A Dialogue on the Costs and Benefits of Automatic Stays for Derivatives and Repurchase Agreements,* 2.

[93] S. J. Lubben, *The Bankruptcy Code Without Safe Harbors,* 84 American Bankruptcy Law Journal, 2010, 126.

[94] We discussed how safe harbors entered into the American legislative scenario in Chapter I when speaking about the rise of repo markets. Suffice it to remember, following the failures of Drysdale Government Securities and Lombard Wall judges ruled that the securities purchased in the repo transactions were not in the property of the lenders and thus were subjected to automatic stays, because it was held that repos were secured loans, triggering panic between market participants. Therefore, amendments to the Bankruptcy Code were made in 1984 to exempt repos in traditional collateral from automatic stays. Further changes were required after the bankruptcy of Criimi Mae, when Congress exempted also non-traditional collateral from the automatic stay as part of the 2005 Bankruptcy Abuse Prevention and Consumer Protection Act (BAPCPA). These accomplishments were also made possible through a solid lobbying activity by those financial institutions that participate in the repo and derivatives market, because they are not favored by the automatic stay provision, since whenever they are in a creditor position, they need flexibility to exit quickly

Code now exempts QFCs, such as repurchase agreements and derivatives, from the automatic stay through special "safe harbors" provisions[95]. These contracts receive special treatment only if the holder of the contract is a protected person as well, but all financial participants are also protected with respect to insolvency legislation[96]. Under these QFC safe harbor provisions, any contractual claim arising from a QFC counterparty in response to a default, whether is to terminate the contract, to set off obligations, or to liquidate collateral, is not subject to the stay and may be exercised at any time[97]. In other words, thanks to the safe harbor mechanism, the buyer can immediately terminate a repurchase agreement by closing out, netting or setting off its positions and seizing the underlying collateral in case of insolvency of its counterparty[98]. The operative result is a reprioritization of creditors' claims within the insolvent counterparty's capital structure as repo buyers do not get directly involved with the long and expensive process of insolvency proceedings[99]. It is this special treatment given to repos in case of insolvency that make repos a convenient form of short-term investment and this also explain the market regrowth in recent years[100].

However, in the interests of providing fuller information, we have to remind that US regulators have imposed new requirements on the terms of QFCs of global systemically important banking organizations (GSIBs)[101]. In sum, a new package of "Final Rules" limits the ability of counterparties to exercise default rights in the context of a GSIB resolution and ensures that actions taken under US law are enforceable on a cross-border basis[102]. The goal is not to undermine the ability of a banking group to

when their counterparties get into trouble. *See* J. Schroeder, *Repo Madness; the Characterization of Repurchase Agreements under the Bankruptcy Code and the U.C.C.,* 1028; J. Schroeder, *Repo Redo: Repurchase Agreements After the Real Estate Bubble*, 5; J. Schroeder, *A Repo Opera: How Criimi Mae Got Repos Backwards,* 565ff.; F. Maclachlan, *Repurchase Agreements and the Law. How Legislative Changes Fueled the Housing Bubble,* 517 ff.

[95] S. Wu, H. Nabilou, *Repo Markets across the Atlantic: Similar but Unalike*, 8.

[96] S. J. Lubben, *The Bankruptcy Code Without Safe Harbors*, 128.

[97] D. Duffie, D. Skeel, *A Dialogue on the Costs and Benefits of Automatic Stays for Derivatives and Repurchase Agreements,* 2.

[98] S. Wu, H. Nabilou, *Repo Markets across the Atlantic: Similar but Unalike,* 8. Note that Clearinghouses are subject to the same rules as other parties with respect to Qualified Financial Contracts in bankruptcy, as we will see in the paragraph 3.2.1. when dealing with the law & economics of CCPs.

[99] J. Armour, D. Awrey, P. Davies, L. Enriques, J. N. Gordon, C. Mayer, J. Paine, *Principles of Financial Regulation*, 455. For further analysis of the subject *see also* S. Vasser, *Derivatives in Bankruptcy,* 60 The Business Lawyer, 2005, 1507 ff.; S. S. Curley, E. Fella, *Where to Hide? How Valuation of Derivatives Haunts the Courts Even After BAPCA,* 83 American Bankruptcy Law Journal, 2009, 297 ff.

[100] J. Armour, D. Awrey, P. Davies, L. Enriques, J. N. Gordon, C. Mayer, J. Paine, *Principles of Financial Regulation,* Oxford, 2016, 455.

[101] S. Grosshandler, K. McIlwain, I. Kleyman, L. Gilbert, A. Forzani, *New Requirements for Financial Contracts Limit Exercise of Default Rights to Support GSIB Resolution,* Cleary Gottlieb Steen & Hamilton LLP, 2017, 1, available at https://www.clearygottlieb.com/-/media/files/financial-contracts-limit-exercise-of-default-rights-to-support-gsib-resolution-v2.pdf.

[102] S. Grosshandler, K. McIlwain, I. Kleyman, L. Gilbert, A. Forzani, *New Requirements for Financial Contracts Limit Exercise of Default Rights to Support GSIB Resolution*, 1.

continue operations during resolution. To this end, GSIBs' QFCs are subject to the limits on the exercise of default rights by counterparties under the Orderly Liquidation Authority (OLA)[103] - a resolution framework to be used when resolution under the Bankruptcy Code would give rise to systemic risk - provisions of the Dodd-Frank Act and the Federal Deposit Insurance Act (FDIA)[104]. The new "Final Rules" will require amendments to the existing documentation, imposing significant compliance burdens.

Across the Atlantic, in Europe, this area of law is harmonized[105]. In particular, repurchase agreements are legally structured as outright sales and therefore many bankruptcy laws are not applicable in the first place. As the securities are in the property of the buyer, they don't need to take enforcing actions against the collateral[106]. As such, theoretically the European mechanism would not require special treatment through safe harbors in case of insolvency[107]. However, possible differential treatments of repo transactions under the national laws of EU Member States and conflicts associated with those legal frictions have triggered the inclusion of safe harbors provisions both in the Financial Collateral Directive ("FCD") and in the Settlement Finality Directive[108]. As widely known, EU directives are not directly applicable and require national implementation, so that national transposition of safe harbor provisions can be slightly different across Member States, reflecting their different legal traditions and market structures[109]. That being said, the safe harbors envisaged in the EU directives are similar to the US ones. Parties agree on a set of risk mitigation tools, such as close-out netting and margin, in their master agreements[110]. Since these clauses might be in conflict with general insolvency rules, in order to prevent the risk that they become unenforceable

[103] The Orderly Liquidation Authority (OLA) is a resolution framework to be used when resolution under the Bankruptcy Code would give rise to systemic risk. In sum, OLA empowers the Federal Deposit Insurance Corporation (FDIC) to transfer QFCs of the covered financial institution to a bridge company which is not in resolution proceedings, *see* S. Grosshandler, K. McIlwain, I. Kleyman, L. Gilbert, A. Forzani, *New Requirements for Financial Contracts Limit Exercise of Default Rights to Support GSIB Resolution,* 4.

[104] S. Grosshandler, K. McIlwain, I. Kleyman, L. Gilbert, A. Forzani, *New Requirements for Financial Contracts Limit Exercise of Default Rights to Support GSIB Resolution*, 1.

[105] P. Paech, *Repo and Derivatives Portfolios Between Insolvency Law and Regulation*, 4.

[106] J. Armour, D. Awrey, P. Davies, L. Enriques, J. N. Gordon, C. Mayer, J. Paine, *Principles of Financial Regulation*, 455. Notwithstanding with this general rule, some jurisdictions include restrictions on borrowers' ability to make payments to creditors or dispose of their assets during a specific period immediately preceding the event of insolvency. For the Italian case *see* L. Guglielmucci, *Diritto Fallimentare,* Turin, 2017, 152 ff.

[107] S. Wu, H. Nabilou, *Repo Markets across the Atlantic: Similar but Unalike,* 6.

[108] S. Wu, H. Nabilou, *Repo Markets across the Atlantic: Similar but Unalike*, 7. *See respectively* Article 8 of the Directive 2002/47/EC of the European Parliament and of the Council of 6 June 2002 on financial collateral arrangements and Article 9 of the Directive 98/26/EC of the European Parliament and of the Council of 19 May 1998 on settlement finality in payment and securities settlement systems.

[109] P. Paech, *The Value of Insolvency Safe Harbours,* 8. The paper tries to filter EU law through some specific European jurisdictions, namely Germany, Italy, England and Belgium.

[110] P. Paech, *Repo and Derivatives Portfolios Between Insolvency Law and Regulation*, 5.

should a party fail, the FCD provides for three layers of protection. The first layer entails provisions upholding contractual clauses that allow for liquidation of repo portfolios in the run up to insolvency and beyond the opening of any proceeding, under which covered contracts are terminated, the market valued is determined as equivalent to replacement costs and a total net amount is determined based on the difference between positive and negative values[111]. Second, the safe harbor provides for a preferential treatment of creditors, allowing for a margining process[112]. Margining is the process by which the value of collateral is regularly adapted to properly reflect the constantly changing exposure flowing from the portfolio, affecting the anticipated net amount[113]. Third, regardless of the approach of national insolvency laws, safe harbors also allow for swift enforcement of collateral and no special procedure has to be followed[114]. In addition, special provisions apply if the defaulting party has documented its repo business under a master agreement, such as the ICMA's GMRA[115]. A defaulting party under the GRMA triggers one of the Events of Default listed in the agreement, triggering contract's close-out[116]. Accordingly, all outstanding obligations due on repos are accelerated for immediate netting and settlement[117].

There is an ongoing debate on whether granting such a privilege to QFCs contributed to the growth of systemic risk, especially during the 2007/2008 financial crisis[118]. On the one hand, as argued by D. Duffie and D. Skeel[119], safe harbors could potentially entail higher social costs, including systemic risk, through several transmission channels, including:

(i) by increasing the likelihood of a firm becoming too big to fail and also increasing the related moral hazard risk;

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[111] P. Paech, *Repo and Derivatives Portfolios Between Insolvency Law and Regulation*, 5.
[112] P. Paech, *Repo and Derivatives Portfolios Between Insolvency Law and Regulation*, 5.
[113] P. Paech, *Repo and Derivatives Portfolios Between Insolvency Law and Regulation*, 5.
[114] P. Paech, *Repo and Derivatives Portfolios Between Insolvency Law and Regulation*, 5-6.
[115] For detailed information about the default management process *see* C. Georgiou, J. Haines, *Understanding Repo and the GMRA,* 155 ff.
[116] R. Comotto, *Frequently Asked Questions on Repo,* 22. The list enumerates many acts of insolvency, such as presentation of a petition for the winding-up of the party, appointment of a liquidator, failures to pay cash amounts, making incorrect or untrue representations, being suspended from dealing in securities by an official body, etc. However, the insolvent party is automatically put into default only when a petition for the winding-up is filed or a liquidator is appointed, otherwise the party is not actually in default until its counterparty serves a Default Notice.
[117] C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 155. This default mechanism was tested during the failure of Lehman Brothers and proved to work well, mitigating the impact of the crisis.
[118] S. Wu, H. Nabilou, *Repo Markets across the Atlantic: Similar but Unalike,* 6. For a discussion on the link between safe harbor and the housing bubble, *see* F. Maclachlan, *Repurchase Agreements and the Law. How Legislative Changes Fueled the Housing Bubble,* 515 ff.
[119] *See* D. Duffie, D. Skeel, *A Dialogue on the Costs and Benefits of Automatic Stays for Derivatives and Repurchase Agreements,* 1 ff.

(ii) by lowering the incentives of the parties to monitor the firm;

(iii) through a general withdrawal from traditional forms of financing;

(iv) by increasing the impact on the market in case of a collateral fire sale, because every creditor can suddenly terminate her contracts;

(v) by lowering the incentives to file for bankruptcy in a timely manner[120].

On the other hand, D. Duffie and D. Skeel argue that there are certain benefits that need to be mentioned[121]:

(i) a possible reduction of the incentives of repo counterparties to "run" when the financial conditions of a firm weaken;

(ii) an increase in the ability of a firm to rely on hedging[122] in order to maintain its trading volume involving repos and derivatives, whereas a stay could impair the risk management of a financial institution;

(iii) a reduction of the risk of financial gridlocks in securities markets;

(iv) a potential limit of individual counterparty credit risk[123] for the sake of overall financial stability[124].

However, financial contracts should receive safe harbor protection only when benefits exceed costs, and this does not seem the case according to some scholars like E. Morrison and M. J. Roe[125]. The introduction of safe harbors was justified to prohibit unfair "cherry picking" of contracts by debtors and reduce the risk that a crisis may result from a bankruptcy[126]. Repos can be source of systemic risk and safe harbors should prevent the risks of contagion by guaranteeing the lenders their right to the collateral, upon the assumption that an increase in the liquidity of collateral should mitigate systemic risk[127]. Nevertheless, S. J. Lubben and the abovementioned scholars argue that safe

[120] The list of transmission channels is entirely drawn from D. Duffie, D. Skeel, *A Dialogue on the Costs and Benefits of Automatic Stays for Derivatives and Repurchase Agreements,* 7-11.
[121] D. Duffie, D. Skeel, *A Dialogue on the Costs and Benefits of Automatic Stays for Derivatives and Repurchase Agreements*, 11-13.
[122] Hedging is a risk-mitigation technique, *see* S. Valdez, P. Molyneux, *An Introduction to Global Financial Markets,* London, Macmillan Palgrave, 2016, 499.
[123] It is the risk involved if a counterparty fails to settle, *see* S. Valdez, P. Molyneux, *An Introduction to Global Financial Markets,* London, Macmillan Palgrave, 2016, 495.
[124] P. Paech, *The Value of Insolvency Safe Harbours*, 30.
[125] E. Morrison, M. J. Roe, C. Sontchi, *Rolling Back the Repo Safe Harbors,* 69 The Business Lawyer, 2014, 1023.
[126] S. J. Lubben, *The Bankruptcy Code Without Safe Harbors,* 130. Also, safe harbors give to the non-bankrupt party an option to terminate upon an insolvency event, which economically amounts to cherry picking as seen from the other side of the deal.
[127] S. Wu, H. Nabilou, *Repo Markets across the Atlantic: Similar but Unalike*, 9. For the role played by safe harbors in the last financial crisis *see* E. H. Gilbane, *Testing the Bankruptcy Code Safe Harbors in the Current Financial Crisis,* 18 American Bankruptcy Institute Law Review, 2010, 241 ff.

harbors should be repealed or at least reduced in scope[128]. Others believe that safe harbors should be maintained as they were instrumental in mitigating systemic externalities of the Lehman failure, while at the same time it has been argued that safe harbors are directly responsible for the Lehman bankruptcy, because the exemptions from the automatic stay failed to prevent a run on the bank[129]. Some other scholars believe safe harbors are applied too broadly and this may lead to a distortion of creditors' behavior in case of financial distress, since the sustaining arguments fail to consider the risks connected with a sudden run to close out positions[130]. In addition, it has been argued that liquidity enhancement in the repo market through safe harbors is essentially reached by shifting liquidity from other more traditional lending sources, thus implicitly subsidizing shadow banking activity at the expenses of other less risky funding activities[131]. According to these scholars, systemic risk is not prevented at all, but on the contrary is increased by encouraging short-term finance, by facilitating runs and by depressing collateral values during a crisis[132].

Overall, there is a significant uncertainty whether safe harbors for derivatives and repurchase agreements reduce financial instability. Common agreement however exist on the "macroprudential foundations" of these concerns, as the wrong functioning of safe harbors might affect the financial system as a whole[133]. Legislators always opt for enhancing liquidity and growth of strong, liquid financial markets, fostering the interests of major market players[134]. Since safe harbors are generally justified on either the liquidity of assets or on systemic risk arguments, the debate is much more relevant in those jurisdictions where insolvency law is based on more creditor-friendly provisions, such as the US[135].

[128] S. J. Lubben, *The Bankruptcy Code Without Safe Harbors*, 123. For further arguments calling for the narrow of repo safe harbors, *see* E. Morrison, M. J. Roe, C. Sontchi, *Rolling Back the Repo Safe Harbors,* 1033 ff. For other conclusions, *see* D. Duffie, D. Skeel, *A Dialogue on the Costs and Benefits of Automatic Stays for Derivatives and Repurchase Agreements*, 20 ff. For observations sharing these concerns, but at the time acknowledging that there is no other effective risk mitigation tool from a global point of view nowadays, *see* P. Paech, *The Value of Insolvency Safe Harbours,* LSE Law, Society and Economy Working Paper No. 9, 2015; and also P. Paech, *Repo and Derivatives Portfolios Between Insolvency Law and Regulation,* LSE Law Society and Economy Working Paper No. 13, 2017.
[129] E. Morrison, M. J. Roe, C. Sontchi, *Rolling Back the Repo Safe Harbors,* 1040.
[130] S. J. Lubben, *The Bankruptcy Code Without Safe Harbors,* 123.
[131] E. Morrison, M. J. Roe, C. Sontchi, *Rolling Back the Repo Safe Harbors,* 1025. Also, the costs of this risk-shifting mechanism is borne by taxpayers.
[132] E. Morrison, M. J. Roe, C. Sontchi, *Rolling Back the Repo Safe Harbors,* 1028 ff.
[133] S. Schwarz, *Secured Transactions and Financial Stability: Regulatory Challenges*, 81 Law and Contemporary Problems, 2018, 57.
[134] P. Paech, *The Value of Insolvency Safe Harbours*, 31.
[135] P. Paech, *The Value of Insolvency Safe Harbours*, 31.

2.3. *Taxonomy of repos*

From a legal and economic point of view, the basic repo agreement can be characterized by a number of different structures, each with their own peculiar features in order to suit specific customer requirements. The first dichotomy is based on differences in the delivery method of cash and the way collateral is managed. In particular, this feature is pivotal to understand the difference between bilateral repurchase agreements (where buyer and seller transact directly), and tri-party repurchase agreements (where a clearing bank positions itself between the borrower and the lender)[136]. Differences between bilateral and tri-party include different timing of settlement, settlement costs and risk protections, and the ability to choose securities that can be posted as collateral[137]. Another relevant distinction, which we will address shortly, involves the so-called General Collateral Finance Repo ("GCF") within the triparty market (*see infra para. 2.3.2.*) and the so-called Hold-in-Custody structure (*see infra para. 2.3.3.*). In addition, the repo market offers a number of different contractual variations, including, for instance:

(i) *cross-currency repos* to trade cash and securities denominated in different currencies;

(ii) *dollar rolls*, which are trades specific to the US mortgage-backed bond market;

(iii) *whole loan repos*, which are fixed income instruments in the domestic US market;

(iv) *exotic repo instruments* such as four-party repos, floating rates, flex and collateral swaps[138].

Before analyzing the most relevant repo variations, it is important to have a sense of the basic taxonomy adopted in repo transactions. First, a repurchase agreement viewed from the perspective of the buyer is called a "reverse repo." Repo and reverse repo are therefore two sides of the same transaction, in the sense that for each repo there is a specular reverse transaction in which the buyer purchases the seller's securities, with a simultaneous commitment to resell, and lends the seller cash by "reversing in" the

[136] M. Barr., H. Jackson, M. Tahyar, *Financial Regulation: Law and Policy,* St Paul, Foundation Press, 2016, 1226.
[137] V. Baklanova, A. Copeland, R. McCaugrin, *Reference Guide to U.S. Repo and Securities Lending Markets,* Federal Reserve Bank of New York Staff Reports No. 740, 2015, 5.
[138] M. Choudhry, *An Introduction to Repo Markets,* Chichester, John Wiley & Sons Ltd, 2006, 17 ff.; *see also* M. Choudhry, *The Repo Handbook,* Oxford, Elsevier Science, 2010, 139 ff.

securities[139]. Second, repos have different maturity dates, that can be "fixed": in this case the repo agreement is called "term repo" and this maturity is generally very short-term. Parties may also agree on an "open repo" where there is no maturity date[140]. In the latter case, the borrower will confirm each morning to the lender whether the repo maturity needs to be extended overnight[141]. If the parties have agreed to conclude an open repo, either party has "on demand" rights to terminate the contract, provided they give notice before an agreed deadline. Otherwise, repos have generally overnight maturity[142]. Comparatively, US-based repo agreements are generally overnight, while Europe-based agreements tend to be a little longer[143]. At the termination date of the contract, that is when the contract has reached its purpose and it no longer valid, parties may agree to extend the duration of the deal by renewing it through a process called "rollover", in which the deal itself may be exactly replicated or adjusted with new contractual terms[144].

Some uncertainty may arise with respect to the terminology as the term "repo" is sometime used by market practitioners to refer to two equivalent instruments, *i.e.* the classic repurchase agreement itself and the sell/buy-back. A sell/buy-back is an outright sale of a bond on the value date, and an outright repurchase of that bond for value on a forward date[145]. Sell/buy-backs have simpler structures than repos as they are just related transactions (a spot sale of securities and a forward purchase of the same securities), relying on the economic relationship between the purchase price of the forward and the price of the spot plus a funding charge[146]. The most important difference is that a repo is always evidenced by a written contract, whereas the sell/buy backs may or may not be documented[147]. Sell/buy back, especially if not documented in writing, are widely

[139] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 29; *see also* S. Lumpkin, *Repurchase and Reverse Repurchase Agreements,* Federal Reserve Bank of Richmond Economic Review, 1987, 15.
[140] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 28. Open repo is used when parties are not yet sure how long they will need to invest cash and finance their assets.
[141] M. Choudhry, *The Repo Handbook*, 132.
[142] R. Comotto, *Frequently Asked Questions on Repo,* 13. Longer maturities are possible, for instance weekly or monthly maturities, even up to three months. Annual maturity is less common, and the contract would be probably structured as a term repo.
[143] S. Wu, H. Nabilou, *Repo Markets across the Atlantic: Similar but Unalike*, 18.
[144] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 28.
[145] M. Choudhry, *An Introduction to Repo Markets,* 11.
[146] C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 5.
[147] C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 5. Because original sell/buy-back were not documented, they did not include any additional contractual rights such as margining, events of default, close out netting etc. Historically, some markets use predominately repurchase agreements, such as the US, UK, Belgium, France, while in others sell/buy-back are more common, like in Italy or Spain, *see* R. Comotto, *Frequently Asked Questions on Repo*, 10. In order to deal with the shortcomings of sell/buy-backs, market participants found practical solutions such as gentlemen's agreements to reprice in case of decrease in value of the purchased securities and arrangements regarding income payments.

discouraged due to the increase in counterparty risk (*see infra para. 3.2.*) and the importance of having written close out netting provisions[148]. Nowadays, according to ICMA's latest European Repo Market Survey, 92.4% of the trading in repo markets is carried through repurchase agreements, 7.3% through GMRA or equivalent master agreements documented sell/buy-backs and only 0.3% through undocumented sell/buy-backs[149].

2.3.1. *Bilateral repo*

The bilateral repos provide for exchange of cash and securities directly between cash providers and collateral providers, usually simultaneously[150]. In a bilateral repo, two parties negotiate the terms of the trade, including the principal amount of the transaction, the interest rate due by the collateral provider, the type of securities they intend to deliver, along with the haircut for the collateral pledged and the maturity date[151].

This type of repo corresponds to the classic definition of repurchase agreement as a two-leg bilateral contract:

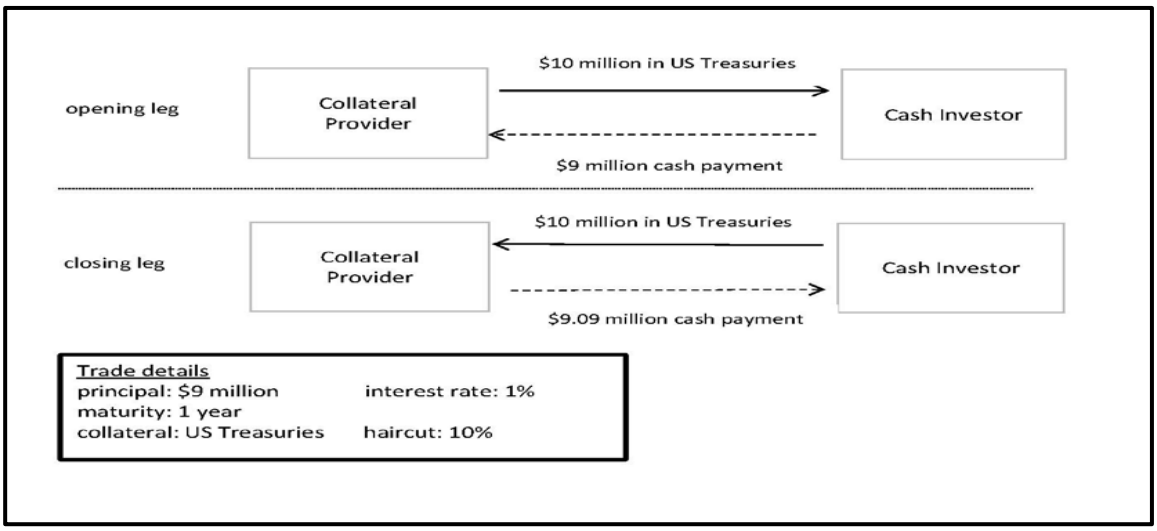
(i) in the first/opening leg the seller ("collateral provider") delivers securities to the buyer in exchange for cash;

(ii) in the second/closing leg the buyer ("cash investor") gives back the securities to the seller for a higher amount of cash, reversing in this way the cash flows[152].

The following diagram provides a visual snapshot of the bilateral repo mechanics.

[148] C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 5.
[149] International Capital Market Association (ICMA), *European Repo Market Survey No 35*, 2018, 18.
[150] T. Adrian, B. Begalle, C. Copeland, A. Martin, *Repo and Securities Lending,* Federal Reserve Bank of New York Staff Reports No. 529, 2013, 5. Also *see* A. Copeland, D. Duffie, A. Martin, S. McLaughlin, *Key Mechanics of the U.S. Tri-Party Repo Market,* Federal Reserve Bank of New York Economic Policy Review, 2012, 2, according to which the bilateral market is additionally classified in two main segment, one in which dealers borrow cash and one in which dealers lend cash. Parties to a bilateral repo also transact among themselves to adjust net borrowings to their desired levels.
[151] V. Baklanova, A. Copeland, R. McCaugrin, *Reference Guide to U.S. Repo and Securities Lending Markets*, 6.
[152] V. Baklanova, A. Copeland, R. McCaugrin, *Reference Guide to U.S. Repo and Securities Lending Markets*, 6.

Example of a Bilateral Repo:[153]



Bilateral repos have many advantages, especially when parties desire to maintain direct interaction or they look for a specific underlying security as collateral[154]. Moreover, this bilateral transaction allows the cash investor to obtain direct control over the collateral for the purposes of hedging against the collateral provider's default risk[155]. The cash investor is also entitled to re-pledge the same collateral in other transactions[156]. This additional right to re-pledge the collateral is a key aspect of bilateral repos. The process through which parties may re-utilize the collateral is called "rehypothecation"[157]. The collateral buyer, as the actual legal owner of the collateral, has the capacity to re-utilize the collateral by re-pledging it to a third party[158]. This process allows the buyer to obtain new funding at lower cost. For example, dealers can buy collateral from a client through a reverse repo and then use the same collateral to grant a loan to the very same client[159]. Purchasing a security from a client can result convenient where the dealer, for example, holds the same asset in custody[160]. In addition, securities dealers rely on bilateral repo to acquire specific securities and as a way of providing funds to their clients, such as hedge

[153] V. Baklanova, A. Copeland, R. McCaugrin, *Reference Guide to U.S. Repo and Securities Lending Markets*, 7.
[154] T. Adrian, B. Begalle, A. Copeland, A. Martin, *Repo and Securities Lending,* 5.
[155] T. Adrian, B. Begalle, A. Copeland, A. Martin, Repo *and Securities Lending,* 5.
[156] K. Schultz, J. Bockian, *Repurchase Agreements,* in S. Swammy, G. Strumeyer (eds.), *The Capital Markets,* Hoboken, Wiley, 2017, 194.
[157] Rehypothecation is an alternative name for repledging or reuse, the latter being also used in the repo market for the outright sale of collateral from the buyer to a third party, potentially causing some confusion in the terminology.
[158] R. Comotto, *Frequently Asked Questions on Repo,* 11.
[159] K. Schultz, J. Bockian, *Repurchase Agreements,* 194.
[160] A. Copeland, D. Duffie, A. Martin, S. McLaughlin, *Key Mechanics of the U.S. Try-Party Repo Market*, 2.

funds, investment trusts or banks, taking advantage of re-hypothecation and early settlement timing to earn higher returns on other trades[161]. However, bilateral contracting has certain costs: parties need to bear the transactional costs of deliveries. Moreover, parties have to ensure sound collateral pricing that may reflect the actual market value of the repo principal discounted for the operational risk that the delivery might not occur[162]. In fact, failure to deliver might occur in the opening leg of the repo transaction if the seller does not pass the securities, or in the closing leg should the buyer fail to give the collateral back. On the one hand, if the seller is faulty, the buyer may usually call for default on seller's obligations to deliver[163]. The buyer is then allowed to withhold cash while the contract remains outstanding, or he may choose to terminate the contract[164]. On the other hand, if the buyer fails to deliver the collateral at the maturity date, the seller may either place the buyer into default or terminate the transaction[165]. In addition, parties may also negotiate to continue the repo transaction[166]. Finally, in a bilateral repo, the buyer is also required to record the securities received as collateral and ensure proper margin is applied[167], while the custodian bank of each party is responsible for clearing and settlement processes[168].

2.3.2. *Tri-party repo*

A tri-party transaction is more complex than a bilateral repo. On the one hand, clearing and settlement occur through a settlement system operated by a third

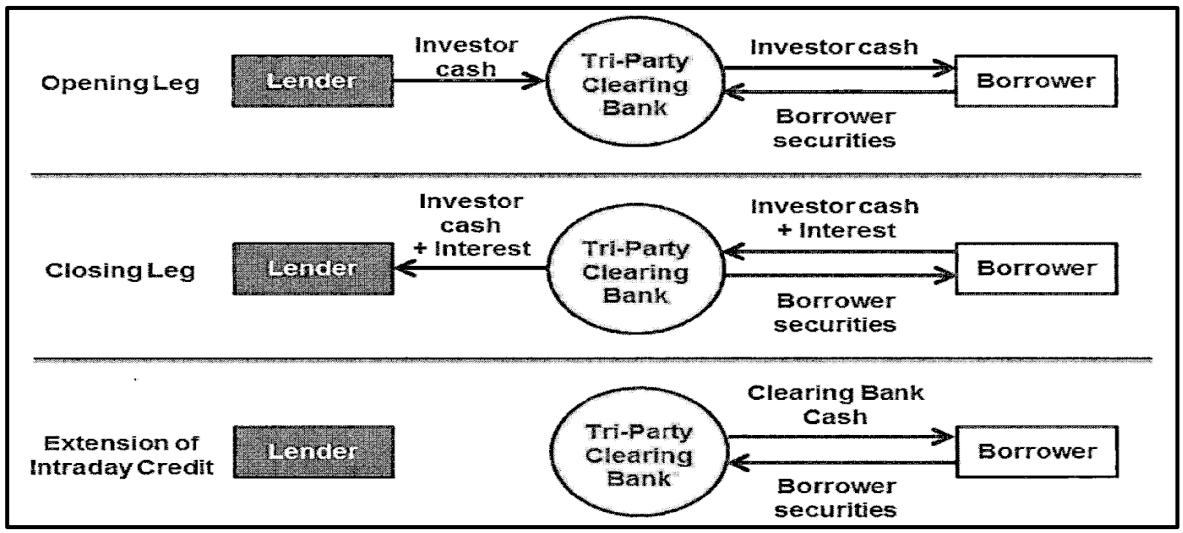
[161] V. Baklanova, A. Copeland, R. McCaugrin, *Reference Guide to U.S. Repo and Securities Lending Markets*, 7.
[162] K. Schultz, J. Bockian, *Repurchase Agreements*, 195. Operational considerations are of utmost importance, because buyers and sellers need to conduct a daily mark-to-market and issue margin calls, as bilateral repo are mainly done through cash settlement whereby deliveries occur on the very same day (so-called delivery versus payment). *Also see* R. Comotto, *Frequently Asked Questions on Repo*, 20, for an explanation of the two occasions when failure to deliver collateral might happen, that is at the start of the repo if the seller fails to deliver or at the end of the repo if there is a failure to deliver by the buyer.
[163] R. Comotto, *Frequently Asked Questions on Repo*, 21.
[164] R. Comotto, *Frequently Asked Questions on Repo*, 21.
[165] R. Comotto, *Frequently Asked Questions on Repo*, 22.
[166] R. Comotto, *Frequently Asked Questions on Repo*, 22.
[167] A. Copeland, D. Duffie, A. Martin, S. McLaughlin, *Key Mechanics of the U.S. Try-Party Repo Market,* 3. Transaction costs may limit the liquidity of the interdealer repo market because the first leg of the transaction has to be settled individually, as the borrower loses his option to delivery relatively early and because the lender has to pay for accommodating a borrower's request to substitute collateral on a term repo.
[168] V. Baklanova, A. Copeland, R. McCaugrin, *Reference Guide to U.S. Repo and Securities Lending Markets,* 5.

intermediary party in its own balance sheets, namely a clearing bank, that holds in custody cash and collateral used in the transaction[169]. The post-trading process is therefore outsourced to a single custodian bank in order to reduce the administrative burden for investors[170]. On the other hand, in the first leg of the transaction there is an initial credit extension to the borrower that usually takes place in late afternoon, while both cash and collateral are transferred to the clearing bank[171]. The clearing bank places the collateral provided by the borrower and the funds obtained from the lender in each other's accounts. In fact, the clearing bank usually holds already collateral and cash from each party, so that it only needs to internally set off the accounts through a process known as "winding the transaction"[172]. During the life of the transaction, borrowers may not access the collateral and lenders cannot withdraw their funds[173]. The clearing bank unwinds the transaction the morning after the transaction occurs by releasing the collateral to the borrower and placing the funds, including a premium, back into the lender's account[174]. Moreover, between the unwinding and winding process the clearing bank extends intraday credit to the borrower in order to ease the financing of its securities inventories, since they are no longer financed by the tri-party cash lender[175].

The following diagram better clarifies this point.

[169] V. Baklanova, C. Caglio, M. Cipriani, A. Copeland, *A New Survey of the U.S. Bilateral Repo Market: A Snapshot of Broker-Dealer Activity,* Federal Reserve Bank of New York Staff Reports No. 758, 2016, 1.
[170] R. Comotto, *Frequently Asked Questions on Repo*, 20. In Europe, the most important clearing agents are Clearstream Luxembourg, Euroclear, Bank of New York Mellon, and JP Morgan. In the US they are Bank of New York Mellon and JP Morgan, the latter having though announced to leave the market soon, *See* Pensions & Investments, *JPMorgan exit from repo market seen as further regulatory fallout,* 16 August 2016. *See also* K. Garbade, *The Evolution of Repo Contracting Conventions in the 1980s,* 12(1) Federal Reserve Bank of New York Economic Policy Review, 2006, 38ff, where the author explains how the market for triparty repo developed, namely by Salomon Brothers in the late 1970s as a device to reduce the cost of financing its positions in Treasury securities.
[171] M. Barr, H. Jackson, M. Tahyar, *Financial Regulation: Law and Policy*, 1228.
[172] M. Barr, H. Jackson, M. Tahyar, *Financial Regulation: Law and Policy*, 1228.
[173] M. Barr, H. Jackson, M. Tahyar, *Financial Regulation: Law and Policy*, 1228.
[174] M. Barr, H. Jackson, M. Tahyar, *Financial Regulation: Law and Policy*, 1228.
[175] M. Barr, H. Jackson, M. Tahyar, *Financial Regulation: Law and Policy*, 1228.

Example of a Tri-Party Repo:[176]



In this regard, some clarifications are needed. The clearing bank does not take the role of principal intermediary in the transaction, but it merely acts as an agent[177]. Therefore, a triparty agent in not a Central Clearing Counterparty (CCP), which instead would interpose between counterparties to net their transaction, becoming the seller to every buyer and the buyer to every seller[178]. Also, a triparty agent is not a settlement venue where securities are delivered and received on behalf of the parties against the receipt and delivery of cash. Furthermore, a triparty agent is not even a Central Securities Depository ("CSD"), which would operate in the settlement phase of the cash transaction by holding the securities and managing the transfer of the same from the seller to the buyer[179]. Instead, the triparty agent it is solely responsible for giving instructions to a CSD on behalf of counterparties to a repo[180]. Finally, a triparty agent is not a trading venue which brings together parties willing to negotiate and execute transactions in accordance with non-discretionary rules: in other words, it is not an exchange or a so-called multilateral trading facility (MTF)[181]. The fact that the clearing bank is an agent also means the legal relationship between the parties remains unchanged while they still

[176] M. Barr, H. Jackson, M. Tahyar, *Financial Regulation: Law and Policy*, 1228.
[177] V. Baklanova, A. Copeland, R. McCaugrin, *Reference Guide to U.S. Repo and Securities Lending Markets*, 8.
[178] R. Comotto, *A Primer on Tri-Party Repo*, 1.
[179] G. Ferrarini, P. Saguato, *Regulating Financial Market Infrastructures,* European Corporate Governance Institute (ECGI) Working Paper No. 259, 2014, 20.
[180] R. Comotto, *A Primer on Tri-Party Repo,* 1.
[181] R. Comotto, *A Primer on Tri-Party Repo,* 1. Once the transaction has been agreed, the parties independently notify the triparty agent who will process the transaction after having matched the instructions.

bear the risks of the transaction, including the risk of default of one counterparty[182]. In the event of default of one counterparty the tri-party agent would simply refuse to receive further instructions from the defaulting party, waiting instead for further instructions from the non-defaulting party[183]. Against this backdrop, in a tri-party repo parties still need to sign bilateral written agreements, such as a master agreement, but they also need further documentation with the triparty agent, adding another layer of contractual obligations[184].

Tri-party transactions offer several advantages, especially where parties involved in repo transactions have no operational capability to trade by themselves. Clearing agents have in fact infrastructure to increase operational efficiencies to reduce costs to both buyers and sellers[185]. Moreover, clearing agents ensure enhanced protection for the purpose of the repo transactions: cash investors are protected from dealer's default through a haircut negotiated with the collateral provider[186]. At the same time, collateral providers are protected from failure of delivery as the collateral is held in custody of the bank and may not be utilized outside its triparty settlement platform[187]. The intermediary also provides a range of services, including collateral management in the form of pricing and daily marking-to-market (*i.e.* daily settling of gains and losses due to changes in the market value of the security), managing trade, collateral selection, payment and ensuring that the collateral posted may satisfy the master agreement standardized provisions, which also details specific requirements for eligible collateral[188].

Against this background, collateral selection is particularly important. Although it may be performed manually by the seller, it is usually automated by the agent through algorithms[189]. European triparty agents also offer sellers an unconstrained right of substitution of the collateral during the life of the repo transaction[190]. Since physical delivery of securities does not take place, transactions costs are lower than in a bilateral

[182] R. Comotto, *Frequently Asked Questions on Repo,* 20.
[183] R. Comotto, *A Primer on Tri-Party Repo*,1.
[184] R. Comotto, *Frequently Asked Questions on Repo*, 20. The documentation may include, for instance, account-opening documents, general terms of business, service agreements. Some provisions are specifically common to triparty documentation: general framework, election of commercial parameters, operating procedures, indemnities, liability limitations, rights of reuse, disputes, governing law, etc. *see* C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 122 ff.
[185] K. Schultz, J. Bockian, *Repurchase Agreements*, 196. Some specific examples of services offered by a triparty agent include account holding, transaction processing, selection of purchased securities, margining, substitutions, reporting.
[186] K. Schultz, J. Bockian, *Repurchase Agreements*, 196.
[187] V. Baklanova, A. Copeland, R. McCaugrin, *Reference Guide to U.S. Repo and Securities Lending Markets*, 8.
[188] K. Schultz, J. Bockian, *Repurchase Agreements,* 196. *Also see* R. Comotto, *A Primer on Tri-Party Repo,* 2, for detailed explanations on the process of collateral selection and substitution.
[189] R. Comotto, *A Primer on Tri-Party Repo,* 2.
[190] R. Comotto, *A Primer on Tri-Party Repo,* 2. The substitution might happen for several reason, for example securities become ineligible or cheaper securities become available.

repo and exchange of cash and collateral is entirely made through a journal entry on the books of the clearing bank[191].

All that being said, triparty contracting also has some downsides, which became clear during the last financial crisis[192]. In particular:

(i) when a broker dealer suffers liquidity shortages, the clearing bank may restrict credit by shortening repo maturities and demanding higher interest rates and more collateral through an increase of haircuts, thus effectively exposing repo borrowers to lenders runs;

(ii) if the solvency of the borrower's is questioned while the transaction is unwound, lenders may refuse to provide funds to rewind the transaction and pull their deposits, exposing the clearing bank to borrowers' credit risk for longer than expected;

(iii) clearing banks may be exposed to borrowers' defaults, triggering a fire sale of the collateral that could cause negative spillover effects to other dealers holding the same securities[193].

From a legal and institutional perspective, the triparty market is somehow different in Europe and in the United Sates. Triparty agents settle around 60% of the American repo market, focusing on treasury and agency debt, while in Europe they are normally involved in managing non-government bonds and equity, staggering at less than 10% of the total repo market[194]. It must be noted that while in Europe true term repos are dominant, in the US the triparty system has traditionally unwound term repos each morning to be rearranged in the afternoon, effectively transforming them in overnight repos that are rolled over each day, in order to give sellers a daily opportunity to replace collateral[195]. In Europe, the same outcome is achieved through direct substitution and margining[196]. Finally, the European market does not suffer from a concentration of the investor base, while the American one is dominated by money market mutual funds and securities lending agents reinvesting cash collateral[197].

[191] K. Schultz, J. Bockian, *Repurchase Agreements,* 196.
[192] M. Barr, H. Jackson, M. Tahyar, *Financial Regulation: Law and Policy*, 1229.
[193] M. Barr, H. Jackson, M. Tahyar, *Financial Regulation: Law and Policy*, 1229.
[194] R. Comotto, *Frequently Asked Questions on Repo,* 21. This is because outsourcing the collateral to a third party is not very economic.
[195] R. Perotti, *The Repo Market,* 4. Also *see* R. Comotto, *Frequently Asked Questions on Repo*, 21, where it is pointed out that this practice requires the triparty agents to create a systemic intraday credit exposure; *also see* A. Copeland , A. Martin, M. Walker, *Repo Runs: Evidence from the Tri-Party Repo Market,* Federal Reserve Bank of New York Staff Reports No. 506, 2011, 6 ff., in which the authors describe the timing of events of triparty repo markets in the United States in three stages: (i) morning: trade agreement; (ii) afternoon: collateral allocation; (iii) next morning: the "unwind".
[196] R. Comotto, *Frequently Asked Questions on Repo*, 21.
[197] R. Comotto, *Frequently Asked Questions on Repo*, 21.

Within the standard triparty market, in the United States a variation on the triparty repo, called Collateral Finance Repurchase Agreement (GCF)[198], was made available to inter-dealer brokers in 1998. This master agreement was introduced by the Fixed Income Clearing Corporation ("FICC") (a subsidiary of the Depositary Trust & Clearing Corporation), JP Morgan Chase and Bank of New York Mellon in order to reduce transaction costs and increase market liquidity[199]. This master agreement allows netting in both legs of the transaction so as to minimize costly transfer of securities, both by extending the time granted to the borrower for delivery and by reducing the cost for collateral substitution[200]. The GCF is settled upon notification to the FICC, which novates the transaction and becomes central counterparty to both parties of the deal. Unlike a standard triparty transaction, where parties' identity is revealed, the GCF is traded anonymously, thus resulting in a blind-brokered interdealer market[201]. In other words, participants do not need to choose and identify a counterparty to complete the transaction[202]. In addition, only collateral settled on the Fedwire Securities Service, like Treasuries or agency securities, may be used as collateral[203]. The common feature with the triparty market is the use of the same infrastructure, as trades are settled on the books of the clearing banks[204]. The main advantage of the GCF is trade netting, which allows dealers to manage their position more flexibly. Some dealers may also use this market to share their inventory financing or exchange their collateral with other financial assets[205]. Currently, in the United States most of the transactions occur via GFC documentation[206].

[198] K. Schultz, J. Bockian, *Repurchase Agreements*, 196.
[199] M. J. Fleming, K. Garbade, *The Repurchase Agreement Refined: GFC Repo,* 9(6) Federal Reserve Bank of New York Current Issues in Economics and Finance, 2003, 1. To participate, dealers must be netting members of FICC's Government Securities Division, *see* T. Adrian, B. Begalle, A. Copeland, A. Martin, *Repo and Securities Lending,* 6.
[200] M. J. Fleming, K. Garbade, *The Repurchase Agreement Refined: GCF Repo,* 9(6) Federal Reserve Bank of New York Current Issues in Economics and Finance, 2003, 3. Moreover, interest on the repo is paid at maturity, but there are daily accrued interests and mark-to-market payments associated with the reversals, protecting financial interests of both parties.
[201] M. Barr, H. Jackson, M. Tahyar, *Financial Regulation: Law and Policy,* St Paul, 2016, 1230
[202] M. Barr, H. Jackson, M. Tahyar, *Financial Regulation: Law and Policy,* St Paul, 2016, 1230.
[203] M. Barr, H. Jackson, M. Tahyar, *Financial Regulation: Law and Policy,* St Paul, 2016, 1230. For instance, Treasuries and agency securities.
[204] M. J. Fleming, K. Garbade, *The Repurchase Agreement Refined: GFC Repo,* 9(6) Federal Reserve Bank of New York Current Issues in Economics and Finance, 2003, 5.
[205] K. Schultz, J. Bockian, *Repurchase Agreements,* 197. *Also see* A. Copeland, D. Duffie, A. Martin, S. McLaughlin, *Key Mechanics of the U.S. Try-Party Repo Market,* 5. *Also see* V. Baklanova, A. Copeland, R. McCaugrin, *Reference Guide to U.S. Repo and Securities Lending Markets,* 8 ff.
[206] T. Adrian, B. Begalle, A. Copeland, A. Martin, *Repo and Securities Lending,* 5.

2.3.3. *Hold-in-custody repo*

Another variation of a repo transaction, peculiar to the American general collateral market, is the so-called "hold-in-custody", in which a dealer offers to hold the securities in its own custody against the investor's cash, generally moving them into a segregated account[207]. In other words, the buyer still acquires legal ownership of the collateral, but the seller retains operational control so that the collateral is not actually transferred. As a result, no settlement charges are incurred, making it a viable alternative should the dealer need to make more collateral substitutions during the term of the transaction[208]. However, the buyer can only count on the dealer's word that the latter is enough collateralized in the event of default[209]. Another risk of this trade is the buyer being possibly subject to fraudulent activity, specifically the risk that a seller may use the same collateral for more than one repo[210]. Hold-in-custodies are not very popular, as investors may face the risk of not receiving their collateralized securities should the collateral provider default[211].

2.4. *Collateral in repo markets*[212]

Collateral plays a pivotal role in financial markets. It may be legally defined as an asset owned by a borrower to which a security interest has been attached to provide security to a lender, which entitles the latter to seize and liquidate the asset in the event

[207] M. Choudhry, *The Repo Handbook*, 137.
[208] Euroclear, *Understanding Repo and the Repo Market,* 2009, 30.
[209] M. Choudhry, *The Repo Handbook,* 137. Accordingly, sometimes the hold-in-custody is also called a "trust me" repo. In the United States, for instance, there have been cases of securities houses that defaulted on loans that were pledged as collateral for numerous hold-in-custody repo trades.
[210] Euroclear, *Understanding Repo and the Repo Market,* 2009, 30. Investors doing this kind of trade should make sure that dealers have good credit quality and they are ought to receive a higher yield on their cash to compensate for the higher risk, *see* M. Choudhry, *An Introduction to Repo Markets,* Chichester, 16; *see also* M. Choudhry, *The Repo Handbook*, 137.
[211] A. Copeland, D. Duffie, A. Martin, S. McLaughlin, *Key Mechanics of the U.S. Try-Party Repo Market,* 3.
[212] The use of the word collateral is somehow confusing with regard to the repo world. Under the GMRA, repo uses the concept of margin, while in securities lending the GMSLA uses the concept of collateral to refer to the same thing. Also, repo market participants usually refer to the underlying purchased securities as collateral, but at the same time any margin provided under a repo is often called collateral. In securities lending, collateral is whatever the borrower provides to the lender that may be used to collateralize the loan and it is equivalent to the margin in a repo, *see* C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 11.

the borrower defaults[213]. In other words, through collateralization, the secured lender is given a property interest in the borrower's assets. Upon discharge of the borrower's debt, the secured lender returns a legally identical asset[214]. In repurchase agreements, the term collateral is generally used to describe the securities sold. A repo transaction transfers full legal title of the security from the seller to the buyer. The seller retains no property interest in the security as the buyer has the right to sell them over to a third party with no need of seller's permission[215]. Nonetheless, the securities transferred in a repo are of uttermost importance in the anatomy of the transaction, because they operate as collateral for the stability of the deal[216]. Collateral in repo should bear the lowest credit and liquidity risk possible, making it easy to sell the underlying securities for a predictable value in the event of default[217].

There are two basic collateral structures around which the transaction can be built:

(i) the general collateral repo ("GC"), which is nowadays dominant in the market;

(ii) the special collateral repo[218].

With regard to the GC market, parties refer to a range of high quality and very liquid assets, fungible with each other, that they are willing to accept in the transaction[219]. In other words, these assets are close substitutes for each other[220]. Therefore, the GC repo rate is purely driven by the supply of, and demand for, cash[221]. When negotiating GC repos, the seller may choose which security to deliver as collateral, since the agreement covers only the term, size and price of the transaction[222]. It is also possible to create GC baskets, whereby an automatic repo trading system ("ATS") or a CCP provides a list of securities in order to facilitate trading[223]. GC substantially eases collateral substitution procedures as the set of available underlying assets is highly diversified and selected to ensure stable financing options[224]. Repo rates in the GC market should be correlated with

[213] International Capital Market Association, *A Guide to Best Practice in the European Repo Market,* 2017, 94.
[214] International Capital Market Association, *A Guide to Best Practice in the European Repo Market,* 94.
[215] International Capital Market Association, *A Guide to Best Practice in the European Repo Market,* 94.
[216] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 2015, 28.
[217] R. Comotto, *Frequently Asked Questions on Repo*, 8.
[218] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 28-29.
[219] R. Comotto, *Frequently Asked Questions on Repo*, 11.
[220] R. Comotto, *Frequently Asked Questions on Repo*, 11.
[221] K. Schultz, J. Bockian, *Repurchase Agreements,* 197.
[222] R. Comotto, *Frequently Asked Questions on Repo,* 11.
[223] R. Comotto, *Frequently Asked Questions on Repo,* 11. When the GC basket is defined by a CCP the selection is automated and managed by a triparty agent, whereas an ATS leaves the seller to decide which security issues to deliver.
[224] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 29.

interbank deposit rates such as LIBOR or Fed funds. However, because repos are secured with collateral, the GC rate are normally below interbank deposit rates[225]. The other available collateral option is the so called "special collateral"[226]. In a special collateral repo, buyers look for specific securities, depending on the asset's characteristics or their financial investment strategy[227]. In order to obtain the securities, buyers might compete by offering more cash, resulting in a lower rate compared to the GC one but also representing a cost for the buyer that has to sacrifice interest on its cash to acquire that security[228]. This happens because investors buying collateral are *de facto* lending money, so they are willing to lend at lower rates in exchange for their desired collateral, driving down the interest rate and causing what is called a collateral squeeze[229].

Regardless of whether securities are traded as GCs or specials, financial intermediaries operating in the repo market need to acquire a large quantity of assets in order to collateralize their transactions. First and most obvious sources of collateral are bond and equities held on their own balance sheets[230]. Another viable alternative is the use of brokerage assets deposited by their clients[231]. However, following the latest financial crisis, securities financing transactions, such as repo, are included in bank's exposure measure under the Basel III framework (*see infra para. 3.5. and para. 3.6.*). In particular, banks are required to hold additional own funds and subordinated debt capital against their repo exposures, thereby reducing the availability of disposable collateral[232]. A third option involves the rehypothecation process described above[233]. The last, very significant source of collateral lies on the securitization process, in which dealers pool together credit-risky assets, which are generally illiquid (*e.g.* mortgage loans), restructure

[225] Euroclear, *Understanding Repo and the Repo Market,* 11. *Also see* K. Schultz, J. Bockian, *Repurchase Agreements*, 198 ff., for an overview of determinants for repo trades. In sum, rates are shaped by macroeconomic conditions that influence the short end of the yield curve. Also, the supply and demand function for short term money highly affects repo rates, since they tend to rise when supply of money available decreases or the demand for money increases. This leads to sellers in need of liquidity to compete for what's available in the market by paying higher rates to buyers. On the other hand, whereby the supply of money increases or the demand for it decreases, the rate decreases accordingly, and lenders will need to compete for borrowers by offering lower financing costs.
[226] R. Comotto, *Frequently Asked Questions on Repo*, 12.
[227] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 29.
[228] Euroclear, *Understanding Repo and the Repo Market*, 12.
[229] K. Schultz, J. Bockian, *Repurchase Agreements*, 199.
[230] J. Armour, D. Awrey, P. Davies, L. Enriques, J. N. Gordon, C. Mayer, J. Paine, *Principles of Financial Regulation,* 455.
[231] J. Armour, D. Awrey, P. Davies, L. Enriques, J. N. Gordon, C. Mayer, J. Paine, *Principles of Financial Regulation,* 455.
[232] K. Schultz, J. Bockian, *Repurchase Agreements*, 200.
[233] J. Armour, D. Awrey, P. Davies, L. Enriques, J. N. Gordon, C. Mayer, J. Paine, *Principles of Financial Regulation,* 456.

them and sell them to special purpose vehicles (SPV)[234]. The SPV then issues securities to finance the purchase of these assets[235]. Simultaneously, the so-called "tranching" of the liabilities allows the SVP to offer different types of securities with varying risk/return and maturity features[236]. The securities issued by the SPV are liquid and they are known as asset-backed securities (ABS) when backed by a variety of different types of loans[237]. Thus, the securitization process effectively allows for the manufacturing of new collateral[238].

After describing the collateral frameworks available to the parties, we need to define which assets are used as collateral in today market practice. Not surprisingly, a survey of the current assets traded in the market indicates that sellers and buyers look for collateral with the lowest counterparty and liquidation risk. These assets are largely represented by bonds issued by creditworthy central governments[239]. In addition, a key component in the selection process is the pricing of the securities, which should reflect the potential risks of the underlying transaction[240]. In this regard, the collateral is valued below its current market price in order to incorporate several risk factors, including counterparty, legal and liquidity risks[241]. This pricing results in a haircut (also called initial margin), that reflects the difference between the actual market value and the purchase price[242]. In assessing collateral quality, buyers look carefully at many factors, including the asset class, price volatility, secondary market liquidity, trading volumes, default risk and credit rating[243]. For all these reasons, the most common collateral are government bonds. Currently, it is estimated that more than 85% of the collateral used in

[234] J. Armour, D. Awrey, P. Davies, L. Enriques, J. N. Gordon, C. Mayer, J. Paine, *Principles of Financial Regulation,* 456
[235] S. Valdez, P. Molyneux, *An Introduction to Global Financial Markets,* 273.
[236] S. Valdez, P. Molyneux, *An Introduction to Global Financial Markets,* 275.
[237] S. Valdez, P. Molyneux, *An Introduction to Global Financial Markets,* 273.
[238] J. Armour, D. Awrey, P. Davies, L. Enriques, J. N. Gordon, C. Mayer, J. Paine, *Principles of Financial Regulation,* 456.
[239] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 29. *Also see* R. Comotto, *Frequently Asked Questions on Repo,* 8.
[240] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 29.
[241] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 29.
[242] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 29. The concepts of haircut and initial margin are both used in the repo market as equivalent tools, but are actually calculated differently. A haircut is a discount to the true value of an asset, for example the value of the purchased security, so if the market value is for instance $100 and a 2% haircut is applied the security will be treated as it had a value of $98. In contrast, the initial margin represents the market value of the collateral as a percentage of the purchase price, for example if the buyer requires a 2% initial margin for every $100 of purchase price that it pays it will receive purchased securities worth $102 from the seller.
[243] K. Schultz, J. Bockian, *Repurchase Agreements,* 200.

the European repo markets are government securities[244]. Structured products, on the contrary, represent a smaller component and are mainly used in the small European tri-party market, where they amount to about 10% of EU triparty repos[245]. In the United States, Treasury securities account for about 65% of the American market, while the remaining is dominated by government-backed Agency debt and Agency Mortgage-Backed Securities[246] (which are bonds issued by a US government-sponsored agency, mostly by Fannie Mae[247] and Freddie Mac[248]). Other collateral are private sector assets, which are less liquid and riskier. Private sector assets include a large variety of securities including, but not limited to:

(i) corporate bonds, typically senior unsecured debt;

(ii) baskets of equity reproducing market indexes;

(iii) covered bonds which are bonds secured by pools of public loans or mortgages held on the issuer's balance sheet;

(iv) AAA-rated mortgage-backed securities (MBS), especially from the residential sector, and other asset-backed and synthetic securities of the highest credit rating;

(v) money market securities such as commercial paper and certificates of deposit;

(vi) bank loans, also known as credit claims;

(vii) gold[249].

Finally, there is a third category of securities represented by bonds issued by supranational institutions, development banks as well as sovereign issuers which offer high ratings but limited maturities and wholesale quantities[250].

Overall, the predominant use of highly rated assets as collateral, *i.e.* with a AAA rating, especially in the European market, makes the repo market resilient and improves financial stability. This is because sovereign bonds are generally risk-free[251]. This is why

[244] International Capital Market Association, *European Repo Market Survey No. 34,* 2018, 14. The survey, survey, conducted in June 2018 and published in October 2018, shows that the figure for government bonds is 85.2%, a slight contraction from the 85.7% registered previously, while the highest peak was reached in June 2017 with 87.6%. Specifically, the shares for each government are allocated as follows: 19.8% Germany, 15.4% France, 13.2% UK, 11.7% Italy, 6.1% Spain, 5.1% USA, 4.9% Japan, 3.4% Belgium, 5.5% other eurozone countries, 5.2% other OECD countries.

[245] S. Wu, H. Nabilou, *Repo Markets across the Atlantic: Similar but Unalike*, 21.

[246] R. Perotti, *The Repo Market,* 3. For an overview of the role played by private-label asset-backed securities as collateral to repo during the financial crisis, *see* A. Krishnamurthy, S. Nagel, D. Orlov, *Sizing Up Repo,* 69(6) The Journal of Finance, 2014, 2394 ff.

[247] Federal National Mortgage Association.

[248] Federal Home Loan Mortgage Corporation.

[249] R. Comotto, *Frequently Asked Questions on Repo,* 8-9.

[250] R. Comotto, *Frequently Asked Questions on Repo,* 8. For instance, these bonds may be issued by the International Bank for Reconstruction and Development (IBRD) or may be foreign currency bonds issued by governments, or even issued by public sector bodies.

[251] S. Wu, H. Nabilou, *Repo Markets across the Atlantic: Similar but Unalike,* 22.

the 2008 financial crisis affected much more the American repo market than the highly government-bond-collateralized European repo market[252].

2.5. *Legal documentation*

Financial transactions are frequently documented through master agreements. These master agreements are written umbrella contracts setting out terms, conditions, rights and obligations governing all transactions underlying the same financial instrument or class of instruments between two or more counterparties[253]. Master agreements are also standardized contract forms. This type of centralized, modular contracting - usually drafted by industry groups to supply core terms for an entire market - is a common practice in global financial markets[254]. Contracts standardization patterns may vary to serve the purposes of a given industry, but they all share three main features:

(i) a central production of contractual language;

(ii) modularity, enabling parties to combine customized and standard terms;

(iii) a commitment to continuously update the document in view of markets' evolving needs[255].

The law and economics of standardized contracts suggests that where a large number of parties use them, they tend to create "network benefits." In particular, the more standardized, the more valuable these contracts are to users, enhancing coordination among counterparties and reducing transactions costs[256] (especially those related to the production of a new contract and drafting of new terms, allowing in this way a more efficient allocation of disposable resources)[257]. Standardized contractual language also lowers the costs related to information gathering, especially in secondary market trading.

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[252] S. Wu, H. Nabilou, *Repo Markets across the Atlantic: Similar but Unalike,* 22.
[253] International Capital Market Association, *A Guide to Best Practice in the European Repo Market*, 106.
[254] A. Gelpern, *The Importance of Being Standard,* European Central Bank 2016 Annual Legal Department Conference Proceedings, 2017, 24. The best known standardized contractual document in the financial industry is the ISDA Master Agreement issued by the International Swaps and Derivatives Association (ISDA). It is used for a wide range of over-the-counter (OTC) derivatives transactions, especially if entered by parties in different jurisdictions. It provides a standard terminology that parties may adopt or disapply and it is usually governed by English law or New York law, *see* https://www.isda.org.
[255] A. Gelpern, *The Importance of Being Standard,* 24.
[256] A. Riles, *Collateral Knowledge. Legal Reasoning in the Global Financial Markets,* Chicago, The University of Chicago Press, 2011, 57.
[257] A. Riles, *Collateral Knowledge. Legal Reasoning in the Global Financial Markets,* 58. The process of adopting a new master agreement can actually take several years before counterparties are persuaded to sign it.

For instance, a variation in contract terms may be perceived as an intelligible signal of willingness or ability to pay[258]. In addition, from an operational point of view, parties are able to pay less to lawyers or bankers to arrange the transaction and can speed-up the transaction in order to take advantage of time-sensitive market opportunities[259]. Moreover, standardized contracts enhance the market response to contingent events, such as financial shocks, and may support the development of institutional structures by codifying market practices[260]. Finally, the theoretical analysis of standardized contracts also proves that standardization decreases litigations costs because they tend to deploy terms that have already been scrutinized by courts, ensuring the transaction is not disputed in jurisdictions where parties have their own center of interests[261]. Accordingly, if a dispute were to arise over the meaning of a contractual term, standardization would save adjudication costs and avoid interpretation errors related to one party subjective intention, as courts would presume that market participants use standardized terms under their standard meaning[262].

However, standardization bears certain costs, as it may amplify financial contagion. Since all standardized contracts provide for the same response mechanisms in the event of financial distress, market participants are likely to negatively react at the same time[263]. Also, the potential cost of judicial errors is very high whenever standard terms are systematically misunderstood or misapplied by judges, leading to contagion in the market[264]. Finally, standardization can become self-perpetuating, especially when boilerplate terms lose their practical relevance, blocking the contractual innovation that might avoid or prevent judicial mistakes[265].

As argued above, an optimal repo transaction is fundamentally based on proper collateral. Considering that there is a risk that a court might invalidate the transfer of title to collateral and recharacterize a repo transaction as a secured loan, it is very convenient (and even mandatory in case of a pledge) to provide a written agreement as evidence of the parties' intention to surrender the rights associated with collateral from the seller to

[258] A. Gelpern, *The Importance of Being Standard*, 27.
[259] A. Gelpern, *The Importance of Being Standard*, 27.
[260] A. Gelpern, *The Importance of Being Standard,* 27.
[261] A. Riles, *Collateral Knowledge. Legal Reasoning in the Global Financial Markets,* 58.
[262] A. Gelpern, *The Importance of Being* Standard, 27.
[263] A. Gelpern, *The Importance of Being Standard,* 27.
[264] A. Gelpern, *The Importance of Being Standard,* 27. The risk is higher when old standard terms remain in the contracts even when they have lost their practical relevance, creating what are called "contractual black holes".
[265] A. Gelpern, *The Importance of Being Standard,* 28.

the buyer, in order for the transaction to be characterized as a sale[266]. Drafting a written agreement is beneficial to a repo transaction for many reasons:

(i) it sets out the procedure to follow in case of counterparty's default;

(ii) it supports netting rights of the non-defaulting counterparty, reducing the costs of insolvency;

(iii) it clearly specifies how margining and risk mitigation tools are to be implemented;

(iv) it settles procedures to deal with critical events that do not constitute default (for instance, the procedure in the event of failure to deliver collateral);

(v) it increases operational efficiency by setting out clear provisions on post trade procedures;

(vi) a consolidated contract allows for operational efficiency of payments and collateral transfer netting;

(vii) an enforceable written agreement is a regulatory requirement under Basel III to recognize the repo as a risk mitigants for the purpose of calculating bank capital requirements[267].

Against this backdrop, the repo industry has adopted a number of master agreements over the year. As argued in Chapter I (*see para. 1.8.),* the most relevant to our research is the Global Master Repurchase Agreement (GMRA), drafted by the International Capital Market Association (ICMA) in cooperation with its US counterpart, the Securities Industry and Financial Markets Association (SIFMA). GMRA is the principal master agreement in Europe and for cross-border repos globally, as well as for many domestic transactions, the governing law of which is English law[268]. GMRA is used in the US market only when an American repo involves an international counterparty, because the US domestic market still tends to adopt a SIFMA-drafted master agreement, the Master Repurchase Agreements (MRA), which is governed by New York law, first published in 1996 and not updated since[269]. GMRA was first published in 1992 and

[266] R. Comotto, *Frequently Asked Questions on Repo*, 16. As we have mentioned, such recharacterization would make the lender an unsecured creditor.
[267] R. Comotto, *Frequently Asked Questions on Repo,* 17.
[268] S. Wu, H. Nabilou, *Repo Markets across the Atlantic: Similar but Unalike,* 7.
[269] S. Wu, H. Nabilou, *Repo Markets across the Atlantic: Similar but Unalike,* 8. For an overview of the differences between the MRA and the GMRA, *see* Securities Industry and Financial Markets Association, *Supplemental Guidance Notes. The Master Repurchase Agreements (1996 Version) and PSA/ISMA Global Master Repurchase Agreement (1995 Version),* 1997, available at https://www.sifma.org/resources/general/mra-gmra-msla-and-msftas/. In sum, each standard agreement was developed in consideration of the market practices and legal environment in New York and London respectively. Accordingly, the main difference is the governing law, New York law for the MRA and English law for the GMRA. There are structural differences in the remedies applicable in the event of the default, as the MRA relies on termination or liquidation or replacement of securities, while the GMRA structures its remedies on close-out and set-off provisions. There are also differences in agency provisions and additional market-based differences relating to the events of default, margin calculation and margin for

updated in 1995 and in 2000, while the latest version was published in 2011 to reflect changes in market practice and to harmonize GMRA with other master agreements, especially the Global Master Securities Lending Agreement (GMSLA) and the ISDA Master Agreement[270]. Currently, there are three main master agreements adopted in market practice:

(i) 1995 GMRA;

(ii) 2000 GMRA;

(iii) 2011 GMRA[271].

GMRA is specifically designed for trading short-term repos of fixed-income European government bonds, but it is possible to amend it to make it applicable to repos of equities or other money market instruments[272].

GMRAs are pre-printed agreements containing provisions that do not need further negotiation by repo counterparties, since they are considered generic to the market[273]. Annex I "Supplemental Terms or Conditions" sets out terms and conditions that are peculiar to the specific transaction, in which additional terms have to be agreed on by the parties[274]. Additional Annexes may be added to adapt the GMRA to specific markets and jurisdictions other than England[275]. Finally, the specific commercial terms of each individual transactions are provided in a model template called Confirmations included in Annex II "Form of Confirmation"[276]. As mentioned above, documenting repos through GMRA is essential for the transaction to be potentially successful. However, regulators also require regularly updated legal opinions as a condition of recognizing the

forward transaction. While the MRA addresses the regulatory status of certain US counterparties, the GMRA has specific annexes to allow for GMRA to be subject to another local law.

[270] R. Comotto, *Frequently Asked Questions on Repo*, 18. Contrary to some beliefs, changes in the GMRA were not adopted as a result of material shortcomings exposed by the financial crisis, since GMRA 2000 responded well during the crisis, especially with regard to the Lehman's failure, but rather to reflect general legal developments in the repo market.

[271] C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 11.

[272] R. Comotto, *Frequently Asked Questions on Repo*, 18. For this purpose, originally any securities or financial instrument could have been object of the transaction, other than US Treasuries, equities and Net Paying Securities under the 1995 GMRA, and equities and Net Paying Securities under 2000 and 2011 GMRA, but currently Annexes have been updated to enable the parties to deal in such instruments, *see* C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 15.

[273] International Capital Market Association, *A Guide to Best Practice in the European Repo Market,* 106. For instance, the general agreement contained in 2011 GMRA is divided into paragraphs, categorized as follows: 1. Applicability; 2. Definitions; 3. Initiation, Confirmation, Termination; 4. Margin Maintenance; 5. Income Payments; 6. Payment and Transfer; 7. Contractual Currency; 8. Substitution; 9. Representations; 10. Events of Default; 11. Tax Event; 12. Interest; 13. Single Agreement; 14. Notices and Other Communications; 15. Entire Agreement, Severability; 16. Non-assignability, Termination; 17. Governing Law; 18. No Waivers etc.; 19 Waiver of Immunity; 20. Recording; 21. Third Party Rights.

[274] International Capital Market Association, *A Guide to Best Practice in the European Repo Market,* 106.

[275] International Capital Market Association, *A Guide to Best Practice in the European Repo Market,* 106. Some available annexes include the Agency Annex, the Bills Annex, the Buy/Sell Back Annex, the Canadian Annex, the Equites Annex, the Gilts Annex, the Italian Annex.

[276] International Capital Market Association, *A Guide to Best Practice in the European Repo Market*, 106.

enforceability of the whole agreement[277]. Accordingly, each year ICMA demands legal opinions in more than sixty jurisdictions on the enforceability of GMRA (or key parts of the agreement), especially the close-out netting provisions[278]. Legal opinions are pivotal for repo markets in order to minimize legal risk, including recharacterization risk, and provide clarity with respect to the legal certainty of the agreement and consequences of a default[279]. In view of this, netting legal opinions are the most important for the mechanics of a repo transaction. They cover the validity and enforceability of the close-out netting provisions, the validity of GMRA as a whole (including issues related to governing law), and the legal nature of repo in order to avoid recharacterization of the collateral title transfer[280]. Market participants look for legal opinions as part of their legal risk management process, to make sure GMRAs are legally valid, and as a mean to benefit from favorable netting treatment for the purposes of regulatory capital, accounting treatment and internal credit limits[281]. Each opinion has standard formatting and covers the following topics:

(i) scope, indicating types of agreement and types of entities covered;

(ii) assumptions, in which the legal counsel provides the factual and legal assumptions on which the netting opinion is based;

(iii) actual opinion, which represents the core content;

(iv) qualifications, that qualify or limit the opinion itself;

(v) insolvency qualifications, explaining insolvency laws and procedure of the jurisdictions involved;

(vi) GMRA core provisions, which are so material to the netting analysis that are not amendable by the parties[282].

Netting opinions are complex and most of the times do not provide straightforward, clarifying answers to the questions posed by the parties. This is why parties need an additional so-called "clean opinion", on whether the opinion itself is sufficiently clear or

[277] R. Comotto, *Frequently Asked Questions on Repo,* 18.
[278] C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 133. The opinions are available only to ICMA members. In 2016, the jurisdictions covered by Netting Opinions were 66, namely Anguilla, Australia, Austria, Bahamas, Bahrain, Barbados, Belgium, Bermuda, Brazil, British Virgin Islands, Canada, Cayman Islands, China, Croatia, Curaçao and Sint Maarten, Cyprus, Czech Republic, Denmark, England, Estonia, Finland, France, Georgia, Germany, Greece, Guernsey, Hong Kong, Hungary, India, Indonesia, Ireland, Israel, Italy, Japan, Jersey, Kuwait, Latvia, Liechtenstein, Lithuania, Luxembourg, Malaysia, Malta, Mexico, Netherlands, New Zealand, Norway, Oman, Philippines, Poland, Portugal, Qatar, Russia, Scotland, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Thailand, Turkey, United Arab Emirates, United States of America.
[279] Euroclear, *Understanding Repo and the Repo Market*, 53.
[280] C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 133. Similarly, ISDA has obtained netting opinions in respect of the ISDA Master Agreement for the derivatives market.
[281] C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 133.
[282] C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 134-135.

not[283]. To conclude, we observe that GMRA is a vital tool to standardize and clarify procedures in the market to reduce risk, adding to operational efficiency and liquidity by creating a layer of legal certainty, which is reinforced when legal opinions are demanded by the parties[284].

2.6. *Repo vs securities lending*

Albeit the scope of this research is strictly limited to repurchase agreements, it is desirable to make some brief remarks on the securities lending market[285]. Repurchase agreements and securities lending (also known as "stock lending"), are both types of securities financing transactions (SFT). They present many similarities, to the point that parties may decide in some cases to use one to replace the other[286]. The market for securities lending has existed since the 19th century but grew in importance in the 1960s. However, it was only during the 1970s that US custodian banks began to lend securities to securities dealers on behalf of their clients[287].

In securities lending a lender lends securities (equity or bonds) to a borrower in return for a fee, while the borrower needs to provide assets as collateral to the lender in order for the lender to secure its position[288]. The collateral may be cash, a security or another financial commitment such as a letter of credit. When it comes to cash, the lender is obliged to reinvest this amount, giving a proportion of it back to the borrower. In practice, the lender just deducts the borrowing fee from the interest to be paid back[289]. The borrower is then obliged to return the securities to the lender, either on demand or at the end of a term[290]. In other words, while a repo transaction involves the commitment of

[283] C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 136.
[284] International Capital Market Association, *A Guide to Best Practice in the European Repo Market,* 107.
[285] For a thorough overview of securities lending, *see* F. Fabozzi, S. Mann, *Securities Finance: Securities Lending and Repurchase Agreements,* Hoboken, John Wiley & Sons Inc., 2005; F. Fabozzi (ed.), *Securities Lending and Repurchase Agreements,* New Hope, Frank J. Fabozzi Associates, 1997.
[286] R. Comotto, *Frequently Asked Questions on Repo,* 13.
[287] V. Baklanova, A. Copeland, R. McCaugrin, *Reference Guide to U.S. Repo and Securities Lending Markets,* 21. Specifically, the market developed to facilitate trade settlements and boosted with the emergence of new trading strategies. For data and statistics on the market size, *see* the ISLA Securities Lending Market Report, last published on March 2018, available at https://adobeindd.com/view/publications/4b2b095a-a6a7-49bc-9dec-7e9008a7e8c2/1/publication-web-resources/pdf/SL_Market_Report_2018_280218.pdf.
[288] C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 6.
[289] V. Baklanova, A. Copeland, R. McCaugrin, *Reference Guide to U.S. Repo and Securities Lending Markets*, 21. *Also see* R. Comotto, *Frequently Asked Questions on Repo*, 13.
[290] F. Fabozzi, S. Mann, *Securities Finance: Securities Lending and Repurchase Agreements*, 3.

the parties to sell and repurchase the securities, in a securities lending transaction one party lends and the other borrows the covered securities[291]. As for the case of repurchase agreements, a party transfers the full legal title of a security to the other party in exchange for the legal ownership of collateral[292].

Common features of repos and securities lending include:

(i) the outright legal and beneficial ownership of securities pass from one party to the other;

(ii) both transactions are meant to be temporary while the associated risk of and rewards of ownership remain with the seller/lender;

(iii) both repo and securities lending require collateralization;

(iv) both allow fixed income bonds or equity to be used as underlying assets;

(v) both rely on close-out netting as principal risk mitigation technique[293].

The market for repo and securities lending originated and developed independently, the former from the fixed income bond market and the latter having its roots in the equity market[294]. Accordingly, market participants were also different, leading to two separate sets of master agreements, each one drafted for the need of the governed trade[295]. For this purpose, in Europe the market was (and is still) represented by the International Securities Lending Association (ISLA) which is in charge of publishing the most widely used standard model contract for international transactions, the Global Master Securities Lending Agreement (GMSLA)[296]. In the US, a Master Securities Loan Agreement (MSLA) is published by the Securities Industry and Financial Markets Association (SIFMA)[297]. Currently, both GMRA and GMSLA/MSLA allow for trading of either bonds or equities, while the remaining differences derive from historical market conventions and transactions' original purposes[298]. Another existing difference between

[291] J. Schroeder, *Repo Redo: Repurchase Agreements After the Real Estate Bubble*, 22.
[292] R. Comotto, *Frequently Asked Questions on Repo*, 13.
[293] C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 12.
[294] C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 12. Still today, repo markets mostly use bonds and other fixed-income instruments as collateral, whereas securities lending still rely on equities.
[295] C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 12.
[296] R. Comotto, *Frequently Asked Questions on Repo*, 14. According to its website, *the International Securities Lending Association (ISLA) is a trade association established in 1989 to represent the common interests of participants in the securities lending industry. ISLA works closely with regulators across Europe and our activities embrace markets and prudential regulatory regimes as well as investor protection. In the United Kingdom, the association has representation on the Securities Lending Committee, a committee of market practitioners chaired by the Bank of England*. *See* https://www.isla.co.uk/about.
[297] The last version dates back to 2000, but it has been revised in 2017. It is available at: https://www.sifma.org/wp-content/uploads/2017/06/MSLA_Master-Securities-Loan-Agreement-2017-Version.pdf.
[298] For a comparison table of key concepts between 2011 GMRA and 2010 GMSLA *see* C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 177.

repo and securities lending is that the latter is typically driven by the need to borrow securities, while repos are used to borrow cash[299]. Given the similarities, there is no right answer on what transaction is the most appropriate for single deals. For instance, if securities were to be exchanged for other securities, the transaction would be more easily dealt under a securities lending transaction scheme than under a repo[300].

Parties decide on the relevant agreement not for structural reasons, but rather for practical or arbitrary motivations, including the following:

(i) a master agreement was already signed in the past, so it is easier to document the transaction under it;

(ii) investment guidelines force a party into a specific form of trading;

(iii) the underlying securities' tax treatment may vary based on the chosen transaction;

(iv) parties may be more familiar with one agreement;

(v) there might be relevant differences in the accounting treatment under national accounting principles[301].

For these reasons, there has been significant trading convergence between repo transactions and securities lending. Operationally, securities lending business may be viewed as a collection of rental fees on assets through collateralized loans, normally facilitated by a securities lending agent which acts as a third party in the transaction[302]. Agent banks help to obtain incremental revenues for securities dealers, while on the other side of the transaction borrowers may use the securities to conduct a short sale, hedge their positions or settle a trade[303]. Short sales by institutions that do not hold the securities and cannot complete delivery are prohibited[304]. As such, securities lending may also be used by firms that want to sell a security, but do not own it[305]. The firm borrows the securities in order to make profitable returns on both the lending transactions itself and on the reinvestment of cash collateral[306]. Main lenders include beneficial asset holders, such as pension plans, mutual or hedge funds, insurance companies and even central banks, whereas main borrowers are hedge funds, asset managers and option traders[307].

[299] V. Baklanova, A. Copeland, R. McCaugrin, *Reference Guide to U.S. Repo and Securities Lending Markets*, 21.
[300] C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 13.
[301] C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 13.
[302] V. Baklanova, A. Copeland, R. McCaugrin, *Reference Guide to U.S. Repo and Securities Lending Markets*, 21.
[303] M. Barr., H. Jackson, M. Tahyar, *Financial Regulation: Law and Policy*, 1231.
[304] T. Adrian, B. Begalle, A. Copeland, A. Martin, *Repo and Securities Lending*, 7.
[305] T. Adrian, B. Begalle, A. Copeland, A. Martin, *Repo and Securities Lending*, 7.
[306] T. Adrian, B. Begalle, A. Copeland, A. Martin, *Repo and Securities Lending*, 7.
[307] T. Adrian, B. Begalle, A. Copeland, A. Martin, *Repo and Securities Lending*, 8.

Overall, securities lending operations enhance assets distribution and improve global market liquidity and price discovery by effectively increasing the supply of securities. However, they may also pose risks to the financial system[308].

2.7. *Accounting treatment*

The complexity of repo is proved by its accounting treatment. The repo accounting may lead parties to undertake potential arbitrage booking strategies to the extent financial reporting comes to be differentiated in two peculiar frameworks. On the one hand, financial firms established in jurisdictions such as the UK or the EU are required to adopt the International Financial Reporting Standards (IFRS). On the other hand, firms established in the US must prepare financial statements based on the US General Accepted Accounting Principles (GAAP)[309]. The accounting treatment is closely related to the legal qualification of repos as outright sales or secured loans. More specifically, if repos were considered true sales, rather than a borrowing, for accounting purposes, the transferred collateral were to be removed from the seller's balance sheet during the life of the transaction (even if the seller has agreed to repurchase the collateralized securities at the maturity date)[310]. Against this backdrop, the seller would not formally record the repo as a liability and its total assets would remain unchanged, as the seller would simultaneously receive, in cash, mark-to-market value of the securities[311]. This accounting treatment would make the seller able to increase its debt obligations by way

[308] V. Baklanova, A. Copeland, R. McCaugrin, *Reference Guide to U.S. Repo and Securities Lending Markets*, 21. For an overview of securities lending and its role in the financial crisis, *see* M. Barr., H. Jackson, M. Tahyar, *Financial Regulation: Law and Policy*, 1232 ff. Briefly, runs on the market drained liquidity and contributed to the failure of Lehman Brothers and the near collapse of AIG. Today, some steps have been taken to mitigate the risks posed by securities, for instance a decrease in use of cash collateral, adoption of more conservative investment strategies and a greater segregation of reinvestment funds.
[309] K. Ong, E. Yeung, *Repos & Securities Lending: the Accounting Arbitrage and their role in the global financial crisis*, 97. International Financial Reporting Standards (before 2001 known as International Accounting Standards/IAS) are developed by the International Accounting Standards Boards (IASB) and currently adopted by more than a hundred jurisdictions across the world, *see* https://www.ifrs.org/about-us/. US General Accepted Accounting Principles are established by the Financial Accounting Standards Board (FASB) and they are officially recognized as authoritative by the Securities and Exchange Commission (SEC), *see* https://www.fasb.org/home.
[310] K. Ong, E. Yeung, *Repos & Securities Lending: the Accounting Arbitrage and their role in the global financial crisis*, 98.
[311] K. Ong, E. Yeung, *Repos & Securities Lending: the Accounting Arbitrage and their role in the global financial crisis*, 98.

of the repo, without any corresponding increase in the leverage ratio and no substantial change in its credit rating[312].

Questions arise on whether this booking mechanism may be used to remove assets from the balance sheet, issue that has been debated in the context of so-called "Repo 105" used by Lehman Brothers[313]. A Repo 105 was an accounting off-balance sheet device which Lehman used to temporarily remove securities and liabilities from its troubled balance sheets, usually for a period no longer than seven to ten days[314]. It involved a repurchase agreement in which the collateral sold was worth at least 105% of the repurchase price[315]. The repo haircut was higher than market standard, where the fixed-income securities are sold at a minimum of 105% (and even 108% for equity securities) of their market value, while average rates staggered at 102%. However, differently from a standard repo which would be accounted for under the US GAAPs as a secured loan, Repo 105 was accounted as a true sale[316]. Lehman Brothers used to enter into this off-balance sheet financing scheme before the end of fiscal periods in order to raise funding needed to pay off its on-balance sheet liabilities[317]. Soon after, it would borrow additional money to close out the repos a few days later after the end of the fiscal period, thus appearing less highly leveraged (*i.e.* total amount of debt used to finance assets) when required to publish its financial statements[318]. This repo device was therefore very attractive to investors and could help Lehman Brothers to meet accounting requirements to make it look the bank had relinquished control over the securities transferred[319]. The transaction was very similar to a standard repurchase agreement, where the investment bank gives highly liquid securities in exchange for cash. The exploitation of this loophole was possible in view of the interpretation of a Financial Accounting Standards Board's (FASB) rule called "Statement of Financial Accounting Standards No. 140" (SFAS 140). This rule was not originally intended for the repo market, but rather it was drafted to determine more clearly when transfers in securitizations are true sales[320]. SFAS 140 was

[312] K. Ong, E. Yeung, *Repos & Securities Lending: the Accounting Arbitrage and their role in the global financial crisis*, 98.
[313] R. Perotti, *The Repo Market*, 9.
[314] A. Jeffers, *How Lehman Brothers Used Repo 105 to Manipulate Their Financial Statements,* 8(5) Journal of Leadership, Accountability and Ethics, 2011, 46.
[315] J. Schroeder, *Repo Redo: Repurchase Agreements After the Real Estate Bubble*, 18.
[316] A. Jeffers, *How Lehman Brothers Used Repo 105 to Manipulate Their Financial Statements*, 46.
[317] J. Schroeder, *Repo Redo: Repurchase Agreements After the Real Estate Bubble*, 18.
[318] J. Schroeder, *Repo Redo: Repurchase Agreements After the Real Estate Bubble*, 18. Repo 105 transactions sometimes reached as much as $50 billion in a quarter.
[319] K. Ong, E. Yeung, *Repos & Securities Lending: the Accounting Arbitrage and their role in the global financial crisis,* 100. Simply put, Lehman was borrowing $100 at $5 interest by lending securities worth 100.
[320] J. Schroeder, *Repo Redo: Repurchase Agreements After the Real Estate Bubble*, 20.

approved to improve the securitization market and allow issuers to remove securitized debt from their balance sheets, without treating the securitized debt an issuer's asset for accounting purpose[321]. For a repo to be characterized under SFAS 140 as a sale of securities, a three-part test needs to be made in order to ensure that the transferor has effectively given up control over the transferred assets[322]:

(i) the transferred assets have to be isolated from the transferor: in other words, they have to be put beyond the reach of the transferor and its creditors (*e.g.* in the case of bankruptcy);

(ii) the transferees have the right to repledge or exchange the assets previously received;

(iii) the transferor has not maintained any effective control over the transferred assets, neither through a binding repurchase before maturity nor through demanding unilaterally the return of the specific assets from the holder[323].

Another fundamental requirement for a repo to be characterized in this way is that there must have been an actual sale at law, which had to be confirmed through an opinion letter from a legal advisor[324]. Lehman Brother was not able to find any American law firms willing to opine on Repo 105: instead, it obtained the same opinion under English law[325]. Accordingly, Repo 105s were governed by English law and documented using the standard GMRA, while contracts were entered into with Lehman Brothers International Europe (LBIE), the Lehman Brother's London subsidiary UK[326]. Lehman Brother's

[321] V. Acharya, T. Sabri Öncü, *The Repurchase Agreement (Repo) Market*, in V. Acharya, T. Cooley, M. Richardson, I. Walter (eds.), *Regulating Wall Street. The Dodd-Franck Act and the New Architecture of Global Finance*, Hoboken, Wiley, 2011, 326.

[322] K. Ong, E. Yeung, *Repos & Securities Lending: the Accounting Arbitrage and their role in the global financial crisis*, 99; *see also* J. Schroeder, *Repo Redo: Repurchase Agreements After the Real Estate Bubble*, 20-21.

[323] K. Ong, E. Yeung, *Repos & Securities Lending: the Accounting Arbitrage and their role in the global financial crisis*, 99.

[324] J. Schroeder, *Repo Redo: Repurchase Agreements After the Real Estate Bubble*, 21.

[325] K. Ong, E. Yeung, *Repos & Securities Lending: the Accounting Arbitrage and their role in the global financial crisis*, 100. The opinion was authored by Linklaters LLP. *Also see* J. Schroeder, *Repo Redo: Repurchase Agreements After the Real Estate Bubble*, 22, where it is observed that the law firm insisted on the buyer's practical ability to deal in securities, therefore making repo a true sale only if it involved liquid securities that could be sold.

[326] K. Ong, E. Yeung, *Repos & Securities Lending: the Accounting Arbitrage and their role in the global financial crisis*, 100. The specific process is depicted by A. Jeffers, *How Lehman Brothers Used Repo 105 to Manipulate Their Financial Statements*, 46. Bonds were purchased through a Special Financing Unit making intercompany transactions with the London affiliate in the following manner: (i) Lehman used to buy government bonds from other banks; (ii) the bonds were transferred to London before the end of the fiscal period; (iii) the London affiliate would give over valuated assets to Lehman's counterparties in exchange for cash, simultaneously agreeing to buy them later at a higher price; (iv) money was used to pay liabilities; (v) less assets and liabilities made financial statements look healthier in the eyes of regulators and investors; (vi) thanks to its regenerated financial statements, Lehman asked and obtained more loans; (vii) at the end of the process, the bank would simply repurchase the securities sold from its London affiliate at 105% of the values of the assets, and as a result its balance sheets again reflected Lehman true inferior position, minus the 5% interest paid.

London affiliate would consolidate its financial results into the financial statements of Lehman Brothers Holdings Inc. located in the USA. While LBIE was subjected to the UK accounting rules of the Companies House, filing to English authorities was made only after the accounting consolidation of the Lehman Brother's group, where special adjustments were pursued for the Repo 105 to ensure it could appear as a legitimate transaction[327].

Albeit being legally sound at the time, Repo 105 was arguably a case of accounting arbitrage as it involved the use of an English legal true sale opinion to comply with US GAAP principles, while trades were also executed using an English entity[328]. The accounting arbitrage provided by the Repo 105 raises questions on whether a financial firm preparing its financial statements under US GAAPs should be allowed to rely on a non-US legal opinion[329]. It must be recalled that in European countries the accounting options making the Repo 105 legit in the US are not available and repurchase agreements must be accounted in the standard way under IFRS, as balance sheets are intended to measure the value and risk of the company and are filed regardless of the legal form of the transaction[330]. With regard to repos, the standard treatment means that the seller shall continue to bear the risk and return on the collateral which remains on his balance sheet, even though the legal title is transferred. This is, because the seller commits to repurchase that collateral in the future[331]. Thus, under IFRS repos cannot be accounted for as sales. The relevant European provision is embedded in IFRS 39 ("Financial Instruments: Recognition and Measurement") which sets the rules for measuring assets and liabilities deriving from financial activities, including repos[332]. For IFRS accounting purposes, repurchase agreements are treated as secured loans (and not as sales transactions). As a result, the legal meaning of "sale" differs from the notion of sale for accounting purposes[333]. Currently, accounting reforms have brought the US GAAPs into alignment

[327] K. Ong, E. Yeung, *Repos & Securities Lending: the Accounting Arbitrage and their role in the global financial crisis*, 101.
[328] K. Ong, E. Yeung, *Repos & Securities Lending: the Accounting Arbitrage and their role in the global financial crisis*, 101.
[329] Lehman's auditing firm was Ernst & Young. K. Ong, E. Yeung, *Repos & Securities Lending: the Accounting Arbitrage and their role in the global financial crisis*, 101. *Also see* A. Jeffers, *How Lehman Brothers Used Repo 105 to Manipulate Their Financial Statements*, 51 ff. for sustaining arguments that Lehman did commit fraud under the SEC Act of 1933 and 1934 by misleading statements and behaved unethically violating the Integrity and Credibility standards of the Institute of Management and also Sarbanes-Oxley Act of 2002's requirements.
[330] R. Comotto, *Frequently Asked Questions on Repo,* 34.
[331] R. Comotto, *Frequently Asked Questions on Repo*, 34.
[332] K. Ong, E. Yeung, *Repos & Securities Lending: the Accounting Arbitrage and their role in the global financial crisis,* 98.
[333] K. Ong, E. Yeung, *Repos & Securities Lending: the Accounting Arbitrage and their role in the global financial crisis,* 98, for a repo to be an off-balance sheet transaction risks have to be passed and control relinquished, but a legal true sale does not necessarily imply these two conditions.

with the IFRS's treatment of repos[334]. After more stringent requirements have been implemented in 2010, the FASB issued in 2014 the "Accounting Standards Update (ASU) No. 2014-11", titled as "Transfers and Servicing (Topic 860): Repurchase-to-Maturity Transactions, Repurchase Financings and Disclosures", under which repo transactions accounted for as sales are now accounted for as secured borrowings[335]. These newly-drafted accounting rules demand effective disclosure to improve transparency in both repo-to-maturity (where securities used as collateral reach maturity simultaneously with the end date of the repo) and repurchase financing (where in addition to a classic repo, the transferee agrees to re-purchase the securities from the original transferor)[336].

In particular, ASU has revised a number of major aspects of repo accounting standards, including:

(i) entities are now required to account repo-to-maturity transactions as secured borrowings;

(ii) the new rules require secured borrowing accounting for repurchase financings;

(iii) disclosure requirements for transfers of financial assets accounted for as sales are expanded;

(iv) if a repo results in an outright sale, additional statements have to be provided, including footnote disclosure of the cash amount, description of obligations, information on pledged collateral and additional explanations of the balance sheet[337].

[334] S. W. Smalt, J. Marshall McComb II, *An examination of Accounting for Repurchase Agreements,* 19 Journal of Finance and Accountancy, 2015, 7.
[335] S. W. Smalt, J. Marshall McComb II, *An examination of accounting for repurchase agreements*, 6.
[336] D. Salerno, J. Ruddy, M. Rajan, *Explaining Recent Modifications to the Treatment and Use of Repurchase Transactions,* 21 (3) The Journal of Structured Finance, 2015, 65. Repo-to-maturity is a repo in which securities used as collateral reach maturity simultaneously with the end date of the transaction and were previously recorded as outright sales. On the other end, repurchase financing involves a typical repo transaction and because they were accounted as sales, this kind of transactions used to lead to an off-balance sheet financing tool.
[337] D. Salerno, J. Ruddy, M. Rajan, *Explaining Recent Modifications to the Treatment and Use of Repurchase Transactions*, 65.

CHAPTER III

REGULATION AND PRACTICE OF REPURCHASE AGREEMENTS

3.1. *Repurchase agreements in practice: purposes, needs and users*

In the previous chapters, we sought to provide an overview of the legal and economic underpinnings of repurchase agreements, including their legal structure and key terms used in repo transactions. This analysis should now proceed by scrutinizing today's market practice and regulatory developments of repurchase agreements.

As anticipated above, financial institutions have different options on how to fund themselves. They can issue equity, debt, or a mix of both. Also, there are a number of alternative financing mechanisms, such as borrowing at fixed or floating rates, secured or unsecured, long-term or short-term, or raising funds from retail depositors[1]. Against this backdrop, short-term wholesale financing - *i.e.* receiving short-term financing from sources outside of traditional retail deposits - is particularly useful for market players that are prohibited from accepting conventional deposits but need to borrow short-term in order to get cheaper financing[2]. The short-term wholesale market is generally very liquid and provides cheap financing for broker dealers, financial firms and institutional investors, although it can dry up in times of financial distress[3]. Here, repos play a pivotal

[1] M. Barr., H. Jackson, M. Tahyar, *Financial Regulation: Law and Policy,* St Paul, Foundation Press, 2016, 1222.
[2] J. Armour, D. Awrey, P. Davies, L. Enriques, J. N. Gordon, C. Mayer, J. Paine, *Principles of Financial Regulation,* Oxford, Oxford University Press, 2016, 452.
[3] M. Barr., H. Jackson, M. Tahyar, *Financial Regulation: Law and Policy*, 1222. *See* A. Martin, D. Skeje, E. L. Von Tadden, *Repo Runs,* Federal Reserve Bank of New York Staff Reports No. 444, 2012; G. Gorton, A. Metrick, *Who Ran on Repo?,* National Bureau of Economic Research Working Paper No. 18455, 2012.

role as they represent the fundamental mechanism through which the so-called money market operate - *i.e.* the market for money instruments with a very short maturity[4].

On the one hand, repos allow for safe investments, because one party of the transaction can invest cash and earn interest against the security of the assets used as collateral[5]. This "safe" investment benefits repo buyers as they may use the collateral to hedge - *i.e.* to invest in order to reduce a risk of adverse price movements - their credit risk (*see infra para. 3.2.*) on the seller, especially if the collateral is issued by a third party whose credit risk is uncorrelated with the credit risk of the seller[6]. In addition, the collateral may be used to meet unforeseen liquidity needs during the life of the repo transaction by selling the assets to a third party[7]. Moreover, risk-adverse investors seeking for liquid investments may use repos - collateralized by high-quality liquid securities - for temporary cash balances and to acquire working capital[8]. To this end, repo transactions mobilize cheap funding by offering secured deposits against liquid assets, diversifying the credit exposure of cash investors and disintermediating traditional but less competitive financial channels[9]. The diversification provided by repo transactions, in particular, fuels a stable money market facilitating liquidity management and reducing systemic risk[10]. This effect is even more evident in the European market, where longer-term funding options, especially through CCP-cleared repos, are common[11] (*see infra*

[4] P. Paech, *Financial Collateral,* 2018, 6, available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3046835. The money market is the market for money instruments with a very short maturity, usually less than one year. For a general discussion on money and bond markets, both domestic and international, *see* S. Valdez, P. Molyneux, *An Introduction to Global Financial Markets,* London, Macmillan Palgrave, 2016, 145 ff. For more details on the issues raised by money markets, *see* M. Ricks, *Regulating Money Creation After the Crisis,* 76(1) Harvard Business Law Review, 2011, 75 ff.; For an overview of the repo market functioning within the financial system and the economy at large, but from a more quantitative perspective, *see* Bank for International Settlements Committee on the Global Financial System, *Repo Market Functioning,* CGFS Papers No. 59, 2017; International Capital Market Association, *Impacts of the Net Stable Funding Ratio on Repo and Collateral Markets,* 2016, available at https://www.icmagroup.org/resources/icma-publications-and-services/icma-reports/.

[5] R. Comotto, *Frequently Asked Questions on Repo,* International Capital Market Association, 2015, 4. An alternative, but equally correct, perspective on the role of repo may be found at M. Choudhry, *An Introduction to Repo Markets,* Chichester, John Wiley & Sons Ltd, 2006, 38, where repo is also described as a mean by which banks and financial firms can obtain specific securities.

[6] R. Comotto, *Frequently Asked Questions on Repo*, 4. In addition, a reduced credit risk means that the loans are subject to lower regulatory capital requirements, improving the return on the cash, *see* Euroclear, *Understanding Repo and the Repo Market,* 2009, 15, available at https://www.theotcspace.com/sites/default/files/2011/11/003-the-repo-market.pdf.

[7] R. Comotto, *Frequently Asked Questions on Repo*, 4. For an empirical analysis of the economic role of liquidity in the repo market, *see* L. M. Fuhrer, *Liquidity in the Repo Market*, Swiss National Bank Working Papers 6/2017, 2017.

[8] R. Comotto, *Frequently Asked Questions on Repo*, 5.

[9] R. Comotto, *Frequently Asked Questions on Repo*, 5.

[10] R. Comotto, *Frequently Asked Questions on Repo*, 5.

[11] S. Wu, H. Nabilou, *Repo Markets across the Atlantic: Similar but Unalike,* Forthcoming European Business Law Review, 2019, 18, available at https://ssrn.com/abstract=3165720. It is not by chance that the European market successfully mitigated risks during the financial crisis. For a thorough overview of

para. 3.2.1.). All these benefits allow financial intermediaries to lower the cost of their services to investors.

On the other hand, repos allow repo sellers to use the cash borrowed to finance a *long position* (*i.e.* buying a security with the expectation the asset will rise in value) in an asset by buying the asset outright, in amounts that reflect the security provided to the lender[12]. Moreover, repurchase agreements allow parties to cover a *short position* (*i.e.* selling a borrowed security, assuming that in the future you will be able to buy it back for a cheaper price) by borrowing the asset and selling it outright, thus the holder might benefit from a fall in the price of the asset between the sale and the repurchase moment[13]. The use of repos to fund long positions and cover short positions, is critical to ensure liquidity in derivative markets[14]. In this regard, repos are used as risk management tools by financial intermediaries and investors to hedge and price derivatives by sourcing collateral as margin[15].

Repos are also important instruments in the "primary securities market" - the market where newly issued securities are sold for the first time - where they are used to

the European repo market *see* L. Mancini, A. Ranaldo, J. Wrampelmeyer, *The Euro Interbank Repo Market,* Swiss Finance Institute Research Paper No. 13-71, 2015.

[12] R. Comotto, *Frequently Asked Questions on Repo,*4. An example of the use of repo to fund a long position in an asset is drawn from: Euroclear, *Understanding Repo and the Repo Market*, 16. Let's assume a dealer buys a bond through an outright purchase from the cash market. She has gone "long" on the bond, since she owns it and will possibly profit from a rise in price and from the coupon. At this stage, the dealer might post the bond as collateral in the repo market and use the cash to pay for the previous outright purchase of the bond itself in the cash market. At the end of the repo, the dealer will repurchase the bond from the repo buyer and sell it back to the cash market, so if the price of the bond has fallen during the life of the repo the seller will suffer a loss on his long position, otherwise she will make a profit.

[13] R. Comotto, *Frequently Asked Questions on Repo*, 4. The mechanics of repo short covering are identical to the classic short selling, the investment strategy relying on the price of the security falling, whereby a stock is borrowed and sold immediately with a promise to return it back at a later date. The investor hopes in a fall of the price, so she can purchase and return the stock back to the lender at a profit, *see* S. Valdez, P. Molyneux, *An Introduction to Global Financial Markets*, 504. An example of the use of repo to cover a short position in a specific security is drawn from: Euroclear, *Understanding Repo and the Repo Market*, 17. Let's assume a dealer sells a bond outright in the cash market. Since she does not own the bond, she is said to have gone "short" of the bond. In the future, she will have to buy it back from the cash market, but it will be too late because she needs to settle her initial sale. Therefore, between selling the bond and eventually buying it back, the dealer has to borrow the bond and she will make the profit from a fall in the price during this interval. In order to borrow the bond, the dealer uses the cash from the outright sale in the cash market to buy the bond through a reverse repo, which means the dealer is legally buying the bond from the repo market, but economically she is just borrowing it as it commits to sell it back to the repo market at a fixed repurchase price. When the reverse repo reaches its repurchase date, the dealer will buy the bond outright from the cash market to sell it back to its repo counterparty. The outright purchase is funded by using the repurchase price received on the reverse repo. If the dealer succeeds in buying the bond back from the cash market, she will be able to fulfill her delivery commitments and will cease to be short of the bond.

[14] International Capital Market Association, *Impacts of the Net Stable Funding Ratio on Repo and Collateral Markets*, 10.

[15] International Capital Market Association*, Impacts of the Net Stable Funding Ratio on Repo and Collateral Markets*, 10.

hedge primary debt issuance - *i.e.* debt that is issued for the first time[16]. Primary dealers - *i.e.* those financial institutions that are authorized to make business deals with the central bank - are exposed to market risks as they execute trades on behalf of their investors in all market conditions, thus providing liquidity support to bond markets[17]. Against this background, repos are used to manage market and credit risks and lower operational costs: for instance, repos allow dealers to fund their bids at bond auctions (the process of selling short and long-term government bonds to investors through an auction) at accessible costs because delivery of securities into the short position can be covered by borrowing in the repo market, thus also providing for a less risky access to the capital market for issuers[18].

There is also a secondary market function of repos, that is ensuring liquidity in the secondary debt market - *i.e.* where previously issued securities are bought and sold[19]. To ensure liquidity in this market, dealers and market makers[20] shall be willing to continuously price the securities to investors, so they hold large quantities of securities to sell to investors on demand[21]. However, if an investor wants to buy securities that are not in the dealer's possession, and she cannot or do not want to buy them immediately from someone else in the market, repo allows for the borrow of that securities in order to deliver them to the investor[22]. In other words, the enhanced liquidity reduces risks for investors by allowing them to buy on demand. It also lowers the costs of borrowing for issuers[23].

Another insightful function of repos is related to yield enhancement (*i.e.* the earning realized on an investment over a period of time) for investors. By entering into such transaction, a party may earn a return by lending an asset highly demanded by the market (a so called "special") in exchange for cash that can be reinvested for a profit[24]. Also, repo as a profit-related tool can be used for pure speculation. For example, a speculator

[16] R. Perotti, *The Repo Market,* 2016, 6, available at http://rp.rperotti.com. The "primary market function" of repo has increased as a result of the issue of a large quantity of debt by European governments and banks in recent years.
[17] International Capital Market Association, *Impacts of the Net Stable Funding Ratio on Repo and Collateral Markets*, 9.
[18] R. Perotti, *The Repo Market*, 6. For an economic analysis of repo and bond markets, *see* Y. Huh, S. Infante, *Bond Market Intermediation and the Role of Repo,* FEDS Working Paper No. 2017-003, 2017.
[19] R. Comotto, *Frequently Asked Questions on Repo*, 4.
[20] A market maker is a dealer in stocks and shares as principal, that is by taking the risk in its own name, *see* S. Valdez, P. Molyneux, *An Introduction to Global Financial Markets*, 501.
[21] R. Perotti, *The Repo Market*, 7.
[22] R. Perotti, *The Repo Market*, 7.
[23] R. Comotto, *Frequently Asked Questions on Repo*, 6. Without repo, market makers would therefore be required to hold larger inventories, increasing the cost of market making itself and the cost of debt to issuers and investors. Also, if market makers would not be able to rely on the ability to cover the temporary short positions taken to hedge temporary long-term ones, the secondary market liquidity would suffer as buying would only be possible when there is a seller and vice versa, hence making debt securities less attractive.
[24] R. Comotto, *Frequently Asked Questions on Repo*, 4. *Also see* M. Choudhry, *An Introduction to Repo Markets*, 41, for a more specific economic analysis. In sum, repo and interbank market participants can enhance yield by lending bonds at the General Collateral rate and then re-investing the cash at a higher rate.

may borrow money through a long-term repo if she believes the interest rates will rise. The speculator can then reverse the transaction by lending cash at higher rates while paying lower rates on the previous repo transaction[25]. On the other hand, if a speculator believes that the interest rates will fall down, she may enter into a reverse term repo, then continue borrowing the money to pay back the maturing transactions, while making profit from the higher rates set for her reverse transaction[26].

Thus far, we have highlighted how repos can be used in the interest of the parties entering into the transaction. However, repos can also be used to "regulate" the market. For instance, the liquidity generated by repos in both the primary and the secondary market foster efficient pricing[27]. This is because liquidity fosters trading strategies that indirectly equilibrate imbalances between the supply and demand of securities and facilitate their price valuation throughout the financial markets[28]. Repos also support the daily operational efficiency of securities markets by preventing settlement failures and allowing for shorter settlement periods[29]. Moreover, repos have a positive impact on collateral management, allowing collateral resources to be fully mobilized and efficiently allocated[30]. Finally, the fact that securities can be borrowed through repos help prevent potential "squeezes" (*i.e.* when profits decline due to increasing costs or decreasing revenues), because financial institutions can keep borrowing to operate in a smooth way[31].

This vast array of repo practices attracts several categories of market participants, that can be categorized as follows:

(i) cash providers (the buyers);

(ii) cash users (the sellers);

(iii) entities buying and selling at the same time;

(iv) entities focusing on special trading strategies;

(v) central banks[32].

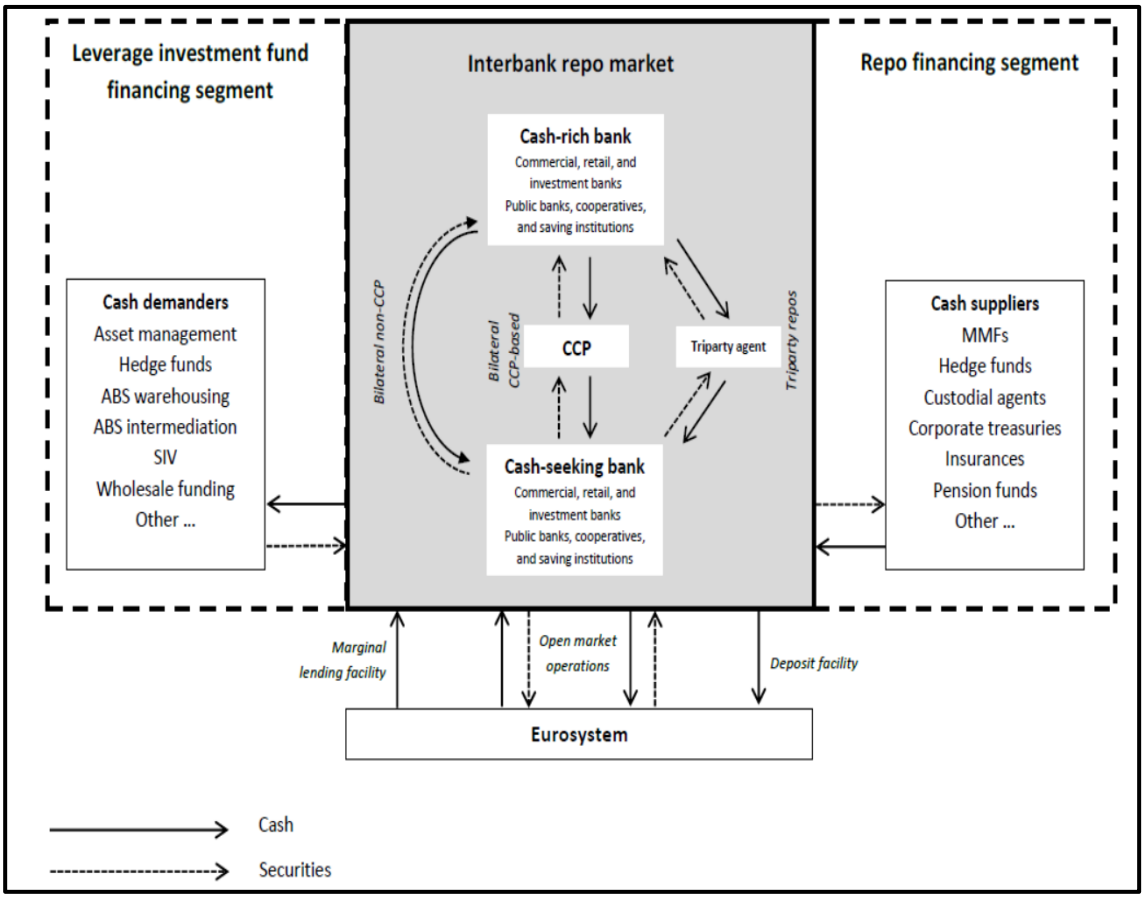
Although these breakdowns are generally recognized in both European and American markets, the main users somehow differ in each market. In Europe, repos are the main source of money market funding for banks and transactions are primarily

[25] R. Perotti, *The Repo Market*, 7.
[26] R. Perotti, *The Repo Market*, 7.
[27] R. Comotto, *Frequently Asked Questions on Repo*, 6.
[28] R. Comotto, *Frequently Asked Questions on Repo*, 6.
[29] R. Comotto, *Frequently Asked Questions on Repo*, 7. Settlement periods in Europe recently changed from T+3 to T+2 in 2014.
[30] International Capital Market Association, *Impacts of the Net Stable Funding Ratio on Repo and Collateral Markets,* March 2016, 9-10.
[31] R. Comotto, *Frequently Asked Questions on Repo*, 7.
[32] K. Schultz, J. Bockian, *Repurchase Agreements,* in Swammy S., Strumeyer G. (eds.), *The Capital Markets,* Hoboken, Wiley, 2017, 189.

conducted in the so-called "interbank repo market" - where banks can extend loans to one another for a specified term using repos[33]. Banking institutions - including commercial, retail, and investment firms, as well as national central banks - looking for risk-adverse opportunities benefit from this huge market fueled by the European System of Central Banks - which consists of the ECB and the national central banks of EU member states (*see infra para. 3.3.*)[34]. Additional market participants include securities market intermediaries and highly leveraged investors, such as hedge funds driven by optimal funding strategies[35].

The following diagram better clarifies the European scenario.

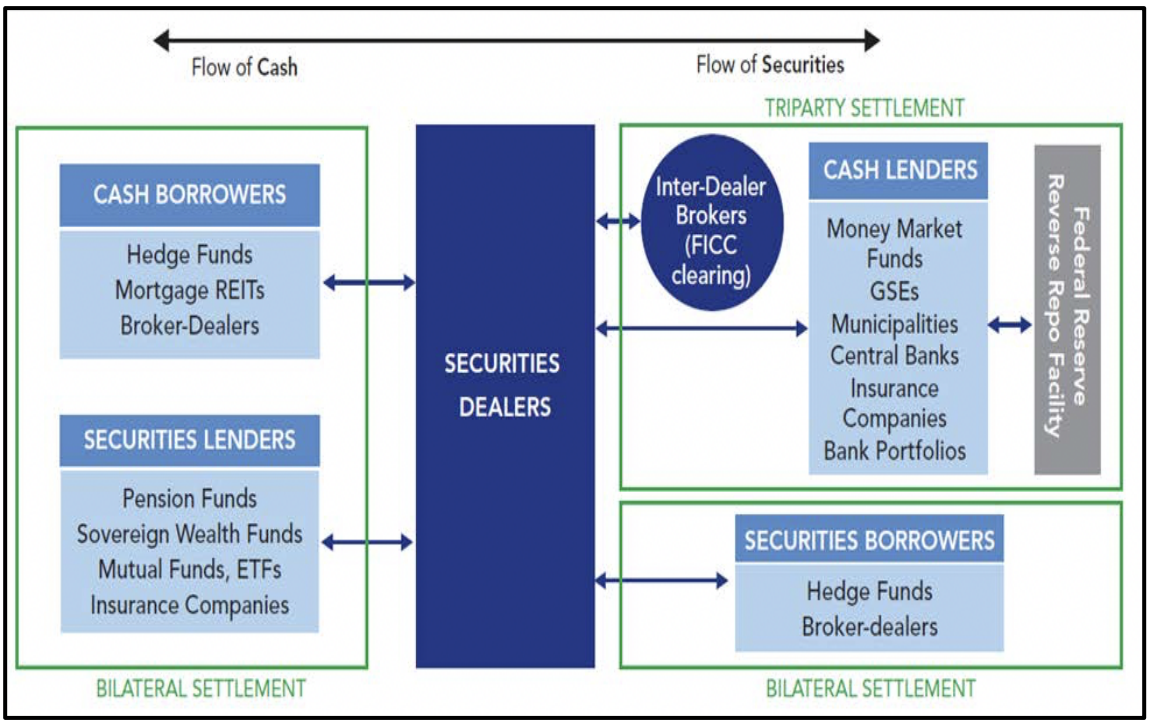
The European (interbank) repo market:[36]



[33] L. Mancini, A. Ranaldo, J. Wrampelmeyer, *The Euro Interbank Repo Market*, 4. The interbank repo market does not include all the repos outside the banking sector.
[34] S. Wu, H. Nabilou, *Repo Markets across the Atlantic: Similar but Unalike,* 17.
[35] S. Wu, H. Nabilou, *Repo Markets across the Atlantic: Similar but Unalike,* 16.
[36] The diagram is drawn from: L. Mancini, A. Ranaldo, J. Wrampelmeyer, *The Euro Interbank Repo Market,* 29.

Conversely, in the United States securities dealers are generally involved in repo transactions, operating as intermediaries between cash lenders and cash borrowers[37]. American lenders are generally institutional investors of cash pools, while borrowers are generally investors, such as broker-dealers[38]. The following diagram provides a visual snapshot of the American scenario.

Repo market participants in the US and the prominent role of securities dealers:[39]



Despite the different composition of repo users in Europe and in the US, their operational functioning and economic purposes are pretty similar. First, repo buyers are risk-adverse, cash-rich investors looking for safe short-term investments, such as money market mutual funds (MMMFs)[40] - *see supra para. 1.5.*, asset managers, insurance

[37] S. Wu, H. Nabilou, *Repo Markets across the Atlantic: Similar but Unalike*, 17.
[38] V. Baklanova, A. Copeland, R. McCaugrin, *Reference Guide to U.S. Repo and Securities Lending Markets,* Federal Reserve Bank of New York Staff Reports No. 740, 2015, 15. Also *see* Securities Industry and Financial Markets Association (SIFMA), *Repo Market Fact Sheet,* 2017.
[39] The diagram is drawn from: V. Baklanova, A. Copeland, R. McCaugrin, *Reference Guide to U.S. Repo and Securities Lending Markets*, 16.
[40] Money market funds are financial intermediary that manage funds on behalf of investors who wish to invest in low-risk securities, but also to be able to withdraw funds at a short notice. Their objective is to maintain the value of their assets' principal, so they only invest in low-risk, short-term securities. Because of their importance in the money market, they would deserve an entire dedicated research that does not fit the scope of this survey. For a detailed overview of this type of fund, *see* M. Kacperczyk, P. Schnabl, *Money Market Funds. How to Avoid Breaking the Buck*, in V. Acharya, T. Cooley, M. Richardson, I. Walter (eds.), *Regulating Wall Street. The Dodd-Franck Act and the New Architecture of Global Finance*, Hoboken, Wiley, 2011, 305 ff.; M. Barr., H. Jackson, M. Tahyar, *Financial Regulation: Law and Policy*, 1197 ff. For

companies, pension funds, corporations, banks, government sponsored entities (GSEs) and municipalities[41]. They trade in repos to earn a profit by maximizing their return on short-term cash. Moreover, they are also motivated by the layer of protection offered by the collateral and, as a result, they are willing to accept a slightly lower yield[42]. Second, sellers are entities such as hedge funds, real estate investment trusts and asset managers looking for low-cost funding strategies to finance or leverage their securities positions to increase portfolio returns[43]. Additionally, as repos are used to obtain specific securities, investment companies, pension funds and insurance companies are the main providers of collateral upon demand[44]. Third, financial intermediaries, such as securities dealers and large banks, engage in repo transactions as both sellers and buyers[45]. The intermediation chain provides clients with collateralized financing and allows the dealers to repledge the collateral to obtain additional funding for cash investors through bilateral and reverse repos, while triparty repos are mostly used by the dealers to fund themselves[46]. After raising funds through repos, these intermediates have a number of alternatives:

(i) they may use these funds to purchase other financial assets in order to keep them in their balance sheets or to repackage them for sale via securitization;

(ii) they can support their brokerage activities to ensure they meet their financial obligations;

(iii) they may use these funds to pay other liabilities, including dividends or debts with third-party service providers[47].

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a description of the exit mechanism for investors in mutual funds, *see* J. Morley, *The Separation of Funds and Managers: a Theory of Investment Fund Structure and Regulation,* 123(5) Yale Law Journal, 2014, 1247 ff. For a discussion of the role of MMMFs in reducing systemic risk, *see* J. R. Macey, *Reducing Systemic Risk: the Role of Money Market Mutual Funds as Substitutes for Federally Insured Bank Deposits,* Yale Law and Economics Research Paper No. 422, 2011.

[41] K. Schultz, J. Bockian, *Repurchase Agreements,* in Swammy S., Strumeyer G. (eds.), *The Capital Markets,* Hoboken, Wiley, 2017, 190. For a market overview *also see* V. Baklanova, *Repo and Securities Lending: Improving Transparency with Better Data,* Office of Financial Research Brief Series No. 15-03, 2015.

[42] K. Schultz, J. Bockian, *Repurchase Agreements,* in Swammy S., Strumeyer G. (eds.), *The Capital Markets,* Hoboken, Wiley, 2017, 190.

[43] V. Baklanova, A. Copeland, R. McCaugrin, *Reference Guide to U.S. Repo and Securities Lending Markets,* Federal Reserve Bank of New York Staff Reports No. 740, 2015, 17. Much of their borrowing activities happens indirectly through the prime brokerage units of these firms, *see* Euroclear, *Understanding Repo and the Repo Market*, 21.

[44] V. Baklanova, A. Copeland, R. McCaugrin, *Reference Guide to U.S. Repo and Securities Lending Markets,* Federal Reserve Bank of New York Staff Reports No. 740, 2015, 17

[45] K. Schultz, J. Bockian, *Repurchase Agreements,* in Swammy S., Strumeyer G. (eds.), *The Capital Markets,* Hoboken, Wiley, 2017, 190.

[46] V. Baklanova, A. Copeland, R. McCaugrin, *Reference Guide to U.S. Repo and Securities Lending Markets,* Federal Reserve Bank of New York Staff Reports No. 740, 2015, 17.

[47] J. Armour, D. Awrey, P. Davies, L. Enriques, J. N. Gordon, C. Mayer, J. Paine, *Principles of Financial Regulation,* Oxford, 2016, 456.

A particular category of users are the "repo conduits" which are Special Purpose Vehicles ("SPVs") that operate as independent firms similar to trusts that mainly operate in the market for reverse repos[48]. A repo conduit finances herself by issuing Asset-Backed Commercial Papers ("ABCPs") secured by collateral received from securities dealers[49]. The collateral is generally illiquid. Therefore, the SPVs need to repack these securities in the form of ABCPs in order to sell them to money market investors[50].

With regard to the triparty repo market, buyers include cash-rich but risk-adverse investors that do not possess internal infrastructures for collateral management and securities settlement, such as money market mutual funds, pension funds, wealth funds and commercial banks[51]. Sellers of triparty products are mostly securities dealers that benefit from the lower operational requirements (*e.g.* not having to take care of collateral management themselves)[52]. As argued above, because of the triparty repo structure, a clearing bank is always involved, acting as an intermediary agent. Finally, as better explained further (*see para 3.3.*), central banks use repos to implement their monetary policy and provide assistance to the banking system[53].

3.2. *Risk management considerations*

Repos are considered to be an inherently low-risk instruments, since they essentially constitute loans of cash secured by generally high-quality securities. This explains their large adoption by a wide range of market participants[54]. The repo market performed pretty well during the financial crisis if compared to other segments of the financial market. However, similarly to any other financial instruments, repos carry an array of potential risks that parties need to take into account when entering into such transactions. These risks reflect the volatility of asset returns and are dependent upon the

[48] Euroclear, *Understanding Repo and the Repo Market*, 21.
[49] Euroclear, *Understanding Repo and the Repo Market*, 21.
[50] R. Perotti, *The Repo Market*, 6.
[51] R. Comotto, *A Primer on Tri-Party Repo,* 2017, 3-4, available at https://www.icmagroup.org/executive-education/courses/the-icma-guide-to-best-practice-in-the-european-repo-market/a-primer-on-tri-party-repo/.
[52] R. Comotto, *A Primer on Tri-Party Repo,* 2017, 4.
[53] R. Comotto, *Frequently Asked Questions on Repo*, 8.
[54] M. Choudhry, *The Repo Handbook*, 291.

uncertainty of future performance[55]. To this end, parties have to resort to risk management, *i.e.* the process whereby financial risks are forecasted, evaluated and identified through appropriate procedures, in order to avoid or minimize their impact[56].

The risk management of repos is featured by:

(i) a careful selection of counterparties;

(ii) the use of proper collateral;

(iii) the certainty upon the legal ownership of the securities being posted as collateral[57].

As previously mentioned, although from a legal standpoint a repo transaction entails a title transfer of the underlying securities to the purchaser which becomes legal owner, the economic effects are misaligned, as risks and rewards of the instruments are with the seller and not with the legal owner[58].

Repo idiosyncratic risk exposures:[59]

MARKET RISK: ● interest-rate risk, collateral price volatility, foreign exchange risk, interest rate gap exposure
CREDIT RISK: ● counterparty risk (default, operational risk, regulatory failure) ● collateral risk (issuer default, lack of liquidity, collateral price volatility)
OPERATIONAL RISK: ● system failure, settlement failure, fraud, procedural risk, etc.
LIQUIDITY RISK: ● market illiquidity, collateral illiquidity, banking liquidity exposure, interest rate gap exposure.
LEGAL RISK ● lack of documentation, translation risk

As one may infer from the table above, the first relevant risk of repurchase agreements is *market risk*, *i.e.* the risk of losses arising from changes in market variables, such as changes in interest rates, foreign exchange rates or equity prices[60]. Market risk

[55] M. Choudhry, *The Repo Handbook*, 291. . For an overview of the risks of wholesale funding, *see* R. Huang, L. Ratnovski, *The Dark Side of Bank Wholesale Funding,* European Central Bank Working Paper Series No. 1223, 2010.
[56] M. Crouhy, D. Galai, R. Mark, *The Essentials of Risk Management,* New York, McGraw Hill, 2006, 4.
[57] R. Comotto, *Frequently Asked Questions on Repo*, 15.
[58] C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 7.
[59] The chart is drawn, but remodeled, from M. Choudhry, *The Repo Handbook*, 291. Idiosyncratic risks are risks that are endemic to a particular asset but are not affected by the market as a whole, thus they can be reduced trough diversification. They are opposed to systemic risk.
[60] M. Crouhy, D. Galai, R. Mark, *The Essentials of Risk Management*, 14.

may arise from price volatility and changes in the value of collateral, resulting in an undercollateralization of repos, should the price of the underlying securities decline[61]. Repo participants are exposed to movements in interest rates during the life of each transaction[62]. In order to mitigate these effects, repos are structured as to require an "initial margin" or haircut, based on which the quantity of cash or of securities is adjusted to ensure overcollateralization[63]. In other words, cash providers require the collateral to be worth more than the principal amount of the trade. The additional mitigating tool of market risk is called "margin", which is based on a haircut percentage[64]. Margining is the process by which the value of collateral is regularly adapted to properly reflect the constantly changing exposure flowing from the portfolio, affecting the anticipated net amount[65]. This margining is daily marked-to-market[66] (*i.e.* the measure of the fair value of securities at the current market practice), and the margin amount is regularly updated taking into account the closing prices of the day before[67].

Repo transactions are also subject to *credit risk*, which can be broadly defined as the risk of losses resulting from a change in the creditworthiness of the counterparty, including risks of counterparty's insolvency or default[68]. Specifically, a contractual party is always exposed to the risk that its counterparty will not satisfy its obligations due to some idiosyncratic or systemic events that may lead to default or insolvency, making the recovery of the owned amounts particularly burdensome[69]. This risk is material as the liquidation of collateral following an event of default is time-consuming and expensive due to legal and operational costs associated with credit recovery. It is important to note

[61] P. Hördal, M. King, *Developments in Repo Markets during the Financial Turmoil*, 40.
[62] M. Choudhry, *An Introduction to Repo Markets*, 47.
[63] P. Hördal, M. King, *Developments in Repo Markets during the Financial Turmoil*, 40. Additionally, repo market participants may also use overnight indexed swaps or futures contracts in order to mitigate interest rate risk, *see* K. Schultz, J. Bockian, *Repurchase Agreements*, 194.
[64] K. Schultz, J. Bockian, *Repurchase Agreements*, 192. The amount of margin may range from less than 1% to higher percentages, depending on the quality of collateral, the tenor of the trade or the creditworthiness of the borrower.
[65] P. Paech, *Repo and Derivatives Portfolios Between Insolvency Law and Regulation*, 5.
[66] Mark to market is the process of valuing securities or derivatives transactions at the current market practice, *see* S. Valdez, P. Molyneux, *An Introduction to Global Financial Markets*, 501.
[67] P. Hördal, M. King, *Developments in Repo Markets during the Financial Turmoil*, 41. Hence, longer-maturity bonds and lower-rated securities require higher margin due to their higher price volatility.
[68] M. Crouhy, D. Galai, R. Mark, *The Essentials of Risk Management*, 14. For a financial analysis of repo counterparty credit risk, *see* C. Ewerhart, J. Tapking, *Repo Markets, Counterparty Risk, and the 2007/2008 Liquidity Crisis,* Swiss Finance Institute Research Paper Series No. 08-24, 2008. According to P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 2015, Lse Legal Studies Working Paper 21/2015, 51, counterparty credit risk may manifest in three ways, because parties negotiate a deal in a situation of information asymmetry: (i) the risk of assessing the creditworthiness of a counterparty; (ii) the risk connected to the evaluation of the collateral pledged as a guarantee of the counterpart's performance; (iii) the risk that the counterparty will default and fail to meet its financial obligations under the contract.
[69] K. Schultz, J. Bockian, *Repurchase Agreements*, 191.

that the collateralization itself does not change the probability of a party's default[70]. For this purpose, when choosing the underlying collateral parties should diversify their credit exposures to ensure that credit risk on collateral has no correlation with the credit risk of the counterparty[71]. Moreover, parties should maximize the value of collateral and minimize any potential liquidation costs by selecting securities that have low credit risks[72]. Finally, to address credit risk, collateral should be easily exchanged between counterparties. This appears to be easier in the US in view of its well-integrated settlement and clearing infrastructures[73]. Against this background, repo master agreements, such as GMRA, employ specific techniques for reducing credit risk in the event of parties' defaults or insolvency during the life of the transaction[74]. This is particularly important in view of the potential number of outstanding contracts between the counterparties at the time of default or insolvency, whose sudden termination may lead to systemic events[75]. The GMRA relies on a combination of close-out netting provisions, margins and haircuts[76]. Close-out netting is a process to reduce the exposures should one of the parties become insolvent: it consists of netting out mutual obligations to calculate a net claim or obligation[77]. These close-out netting arrangements, which are in principle enforceable in all relevant jurisdictions (*see supra para. 2.5.*), mitigate credit risk as follows:

(i) the non-defaulting party can accelerate or terminate all outstanding transactions under the master agreement;

(ii) all non-cash obligations - such as the delivery of securities - are valued and converted into cash obligations;

(iii) all cross-currency obligations are converted into a single currency;

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[70] R. Comotto, *Frequently Asked Questions on Repo,* 15. Comotto stresses out that collateral should only be treated as some kind of insurance against the default of the seller, not as a substitute for her credit risk. However, often parties feel they can benefit from a "double indemnity" based on both the counterparty and the collateral, *see* Euroclear, *Understanding Repo and the Repo Market*, 43.

[71] R. Comotto, *Frequently Asked Questions on Repo*, 15.

[72] R. Comotto, *Frequently Asked Questions on Repo*, 15. For instance, government securities satisfy those conditions.

[73] R. Comotto, *Frequently Asked Questions on Repo*, 15.

[74] C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 9.

[75] P. Paech, *Close-Out Netting, Insolvency Law and Conflict of Laws,* LSE Working Paper No. 14/2014, 2014, 6.

[76] C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 9.

[77] P. Paech, *Close-Out Netting, Insolvency Law and Conflict of Laws,* 6. Legally speaking, close-out netting is somehow different from common set-off which applies only to obligations of the same kind which are already due, whereas close-out netting aggregates the value of a multitude of contracts that are still open with variable contents. *Also see* S. H. Zhu, M. Pykhtin, *A Guide to Modeling Counterparty Credit Risk,* GARP Risk Review, 2007, and International Capital Market Association, *A Guide to Best Practice in the European Repo Market,* 2017. For an overview of the uses and benefits of netting in the international financial framework and the relationship between netting and systemic risk, *see* P. Paech, *Systemic Risk, Regulatory Powers and Insolvency Law. The Need for an International Instrument on the Private Law Framework for Netting,* Institute for Law and Finance Working Paper No. 116, 2010

(iv) the sums are set off or netted, so that only a single net balance is payable by one party to the other[78].

In addition to netting provisions, credit risk may also be mitigated through margin maintenance (*i.e.* the minimum amount of equity that must be maintained in a margin account, which is used by a broker to lend the customers cash to buy securities) and ongoing due diligence and credit analysis of counterparty's creditworthiness[79].

A third type of risk involving repo transactions is *operational risk, i.e.* the risk that may arise from financial losses resulting from potential operational breakdowns related to people, processes, and technology (including, but not limited to, frauds, IT failures, operational errors, or natural disasters)[80]. The most relevant operational risk of repo transactions is certainly related to the transfer and management of the collateral, as either party may fail to deliver the security[81]. A timely settlement of collateral transfers and margin calls (*i.e.* when a broker demands more money or securities to meet the minimum maintenance margin) are key factors in retaining the economic benefits of repos[82].

Another important risk underlying repo is *liquidity risk*, which occurs when the existing short-term financings cannot be rolled over while funding alternatives are not available at reasonable costs[83]. This risk arises from the intrinsic nature of a repo transaction, where long-term, illiquid assets are financed by short-term liquid claims, through a continuous rollover of repos into new transactions[84]. Ideally, if a party defaults on its obligation, the counterparty may sell the collateral outright at its market value, generally recovering any loss[85]. However, in periods of financial distress this could be difficult to achieve, as the seller may not be able to find a counterparty willing to execute a new transaction. In this case, the seller would need to sell the security at lower price to quickly gain new funding to cover losses[86]. Moreover, when multiple creditors react simultaneously in this way, a fire-sale of the security may occur, triggering a systemic liquidity event very similar to what happened at the outset of the latest financial crisis[87].

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[78] C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 10.
[79] K. Schultz, J. Bockian, *Repurchase Agreements*, 192.
[80] M. Crouhy, D. Galai, R. Mark, *The Essentials of Risk Management*, 14.
[81] P. Hördal, M. King, *Developments in Repo Markets during the Financial Turmoil*, 41.
[82] Euroclear, *Understanding Repo and the Repo Market*, 31. For a discussion of the consequences of a failure to deliver under GMRA, please *see para 2.3*.
[83] K. Schultz, J. Bockian, *Repurchase Agreements*, 192. To be more specific, liquidity risk may refer on the one hand to the situation whereby a bank has insufficient funding to meet its commitments, and on the other to the risk that a securities house is unable to trade its assets because the market has become too thin.
[84] K. Schultz, J. Bockian, *Repurchase Agreements*, 192.
[85] M. Choudhry, *The Repo Handbook*, 300.
[86] K. Schultz, J. Bockian, *Repurchase Agreements*, 192.
[87] K. Schultz, J. Bockian, *Repurchase Agreements*, 192. Both Basel III and the Dodd-Frank Act sought to address liquidity risk by increasing capital requirements in order to limit bank's reliance on short-term funding. For an excellent overview of liquidity requirements reforms, *see* H. Scott, *Interconnectedness and*

One of the last relevant risk that may affect repos is *legal risk,* which is the litigation risk arising from failure to agree on the interpretation of legal terms[88]. In addition, it may refer to the difficulty in enforcing a legal arrangement in the event of party's default[89]. However, legal risk can be properly managed and minimized by the adoption of a standard master agreement governing the repo transaction[90] (*see supra para. 2.5.*).

The market for repurchase agreements also bears risks that affect the stability of the financial system as a whole. This "*systemic risk"*[91] occurs when market participants are exposed to each other's failure in such a way that the risk of contagion becomes staggering, causing a chain of events that makes the whole economy dysfunctional[92]. A period of distress in the wholesale market may cause a run on repos, due to a general loss of confidence in the creditworthiness of dealers along with the value and liquidity of financial collateral. This mechanics is similar to deposit runs experienced by conventional deposit-taking institutions[93]. Specifically, lenders may suddenly cease to roll over their repo exposures or they may demand greater haircuts, forcing borrowers to post more and more collateral as a guarantee[94]. This mechanism constitutes a true paradox of repo market: one the one hand repos are used to increase liquidity by extending funding sources; on the other hand, the very same liquidity dynamics may act as a transmission channel of negative shocks from the money market to the wider financial system[95]. Systemic instability may also be exacerbated by the very same features of repos, including collateralization and priority status under bankruptcy laws, thus lowering the incentives of market participants to engage in adequate monitoring of the transactions' normal

Contagion. Financial Panics and the Crisis of 2008, 2014, 121 ff., available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2178475.

[88] M. Choudhry, 292.

[89] M. Choudhry, 292.

[90] M. Choudhry, *The Repo Handbook*, 303.

[91] For a discussion of systemic risk, *see* V. Acharya, C. Brownlees, R. Engle, F. Farazmand, M. Richardson, *Measuring Systemic Risk,* in V. Acharya, T. Cooley, M. Richardson, I. Walter (eds.), *Regulating Wall Street. The Dodd-Franck Act and the New Architecture of Global Finance,* Hoboken, Wiley, 2011, 87 ff.

[92] P. Paech, *Systemic Risk, Regulatory Powers and Insolvency Law. The Need for an International Instrument on the Private Law Framework for Netting,* Institute for Law and Finance Working Paper No. 116, 2010, 15. For an economic analysis of the determinants of systemic risk in money markets, *see* G. Lopez-Espinosa, A. Moreno, A. Rubia, L. Valderrama, *Short-Term Wholesale Funding and Systemic Risk: A Global CoVaR Approach,* International Monetary Fund Working Paper 12/46, 2012, 16 ff.

[93] J. Armour, D. Awrey, P. Davies, L. Enriques, J. N. Gordon, C. Mayer, J. Paine, *Principles of Financial Regulation*, 456. For a discussion of repo markets during the financial crisis, *see* G. Gorton, A. Metrick, *Who Ran on Repo?,* National Bureau of Economic Research Working Paper No. 18455, 2012.

[94] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 36.

[95] J. Cullen, *The Repo Market, Collateral and Systemic Risk: in Search of Regulatory Coherence*, in I. H.-Y. Chiu, I. G. MacNeil (eds.), *Research Handbook on Shadow Banking. Legal and Regulatory Aspects,* Cheltenham, Edward Elgar Publishing, 2018, 94.

dynamics[96]. Also, systemic instability may be caused by excessive collateral re-hypothecation, as the creation of complex chains of securities may undermine the dealers' ability to satisfy the demands on a timely basis, causing a collateral run[97]. Against this backdrop, systemic risk-mitigants tools include close-out netting provisions, as they shield market participants from the consequences of defaults, along with proper collateralization, segregation of assets and standardization of repo transactions[98]. In addition, central clearing counterparties are fundamental for repo's systemic risk management.

3.2.1. *The costs and benefits of central clearing counterparties*

Central clearing counterparties (CPP)[99], also referred to as "clearing houses", are post-trading Financial Markets Infrastructures (FMIs) that contribute to financial stability and market efficiency, by providing an invaluable risk management mechanism for repo transactions[100]. Overall, CCPs provide for a legal framework for accessing their services, ultimately achieving a loss mutualization function in the financial system that aims at mitigating systemic risk[101]. The last financial crisis revealed a compelling need for

[96] J. Armour, D. Awrey, P. Davies, L. Enriques, J. N. Gordon, C. Mayer, J. Paine, *Principles of Financial Regulation,* Oxford, 2016, 457.
[97] J. Armour, D. Awrey, P. Davies, L. Enriques, J. N. Gordon, C. Mayer, J. Paine, *Principles of Financial Regulation*, 458-459. There is also a specific systemic risk arising from the triparty market, because the daily unwind performed by clearing bank shifts intra-day risk from the lenders to the agent, *see* B. Tuckman, *Systemic Risk and the Tri-Party Repo Clearing Banks,* Center for Financial Stability Policy Paper, 2010.
[98] P. Paech, *Systemic Risk, Regulatory Powers and Insolvency Law. The Need for an International Instrument on the Private Law Framework for Netting*, 15.
[99] "Clearing" refers to those activities carried out between the trade and settlement of a financial transaction, such as a derivative or a repo, including calculations of net obligations and ensuring availability of financial instruments or cash to secure exposures arising from certain positions, *see* H. Nabilou, I. G. Asimakopoulos, *Examining the Prudential Regulation and Resolution Regimes for Central Clearing Counterparties in Europe,*2018, 2, available at https://www.ssrn.com/en/.
[100] G. Ferrarini, P. Saguato, *Regulating Financial Market Infrastructures,* ECGI Working Paper No. 259, 2014, 19. CCPs are Financial Markets Infrastructures (FMIs). FMIs can be defined as multilateral systems that mitigate or allocate risks and costs in the market. They are built on two pillars that serve as actual market utilities: trading venues (*i.e.* exchanges, electronic platforms, etc.) and post-trading venues. While trading infrastructures operate at the transactional level by executing orders and providing services to buyers and sellers, post-trading infrastructures provide for network services and facilitate connections among market participants, enhancing transparency. The latter category include central clearing houses (CCPs), central securities depositories (CSDs) and trade repositories (TRs), offering clearing, settlement and reporting, respectively. Each post-trading infrastructure contribute in managing and reducing separate aspects of systemic risk. For a discussion of FMIs and repos *see* P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 2015, Lse Legal Studies Working Paper 21/2015, 45 ff.
[101] P. Saguato, *The Ownership of Clearinghouses: When "Skin in the Game" is not Enough, the Remutualization of Clearinghouses,* 34 Yale Journal on Regulation, 2017, 114.

sophisticated risk management networks where globally-traded financial products can be cleared in order to improve collateral, risk controls and loss absorption[102]. To this end, CCPs reduce market interconnectedness, mitigating the risk of runs and systemic contagion across the market[103]. From a legal standpoint, CCPs interpose themselves between two counterparties to a financial trade (such as a repo), becoming counterparty of both sides of the transactions. In other words, CCPs shall act as the buyer to the original seller and the seller to the original buyer, assuming their rights and obligations[104]. With respect to repo transactions, CCPs will interpose itself in the transaction once the repo trade has been agreed and registered with the CCP via a process called "*netting by novation"*[105]. As CCPs take two identical offsetting positions with the parties, they operate through a "matched book", meaning that maturities of assets and liabilities are equally distributed, thus simplifying the large number of transactions in the market[106]. The novation process makes CCPs actual intermediaries, so that they will continue to perform even in the event of counterparty's failure[107].

In addition, CCPs net out ("clear") the transactions on a multilateral basis, rather than individually, thereby:

(i) reducing net exposures on the market (a process generally referred to as "trade compression") and therefore downsizing balance sheets;

(ii) maximizing the use of collateral in the system;

(iii) simplifying the liquidation of the collateral in the event of default[108].

Multilateral netting also makes CCPs a source of liquidity and certainty in the financial market, because it may accelerate cash payouts by engaging in liquidity partitioning when a trading firm fails[109]. Liquidity partitioning is the process applied when a member of the CCP becomes bankrupt: the CCP will keep a portion of the defaulted member's most liquid assets, together with a matching portion of the member's short-term debt, out of the bankruptcy estate, so as to repay the debt with the assets

[102] H. McVeA, *Central Counterparties and Sale and Repurchase Agreements: Regulating Financial Markets in the Light of Yet Another "False Dawn"*, 17(1) Journal of Corporate Law Studies, 2017, 112.
[103] H. Scott, *Interconnectedness and Contagion. Financial Panics and the Crisis of 2008,* 2014, 67, available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2178475. For instance, CCPs successfully helped to contain Lehman's default.
[104] S. Wu, H. Nabilou, *Repo Markets across the Atlantic: Similar but Unalike*, 22.
[105] R. Comotto, *Frequently Asked Questions on Repo*, 24. Whereas if the CCP is an original party, so that one transaction automatically generates two contracts, the process is called *open order.*
[106] P. Saguato, *The Ownership of Clearinghouses: When "Skin in the Game" is not Enough, the Remutualization of Clearinghouses*, 115.
[107] J. Cullen, *The Repo Market, Collateral and Systemic Risk: in Search of Regulatory Coherence,* 100.
[108] P. Saguato, *The Ownership of Clearinghouses: When "Skin in the Game" is not Enough, the Remutualization of Clearinghouses*, 118.
[109] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 54.

retained[110]. From an economic point of view, the novation process reflects the role of CCPs in mitigating counterparty credit risk. In addition, CCPs plays the role of stabilizer as a consequence of its own structure, that includes a mutual guaranty and a loss sharing fund underwritten by all of its members[111]. To this effect, clearinghouses are backed by a number of capital buffers (*i.e.* mandatory capital in addition to minimum capital requirements) in the form of initial margins, default funds, reserves and equity, supported by risk-sharing arrangements (*i.e.* when parties identify a risk and agree to share the potential loss) among its members, such as "default waterfalls" (*see infra*)[112]. Credit risk management is best achieved via this centrally cleared market, as CCPs are the prime and sole counterparty to all its members: therefore, they are only exposed to the default of the clearinghouse itself[113]. As such, multiple contract novations reduce overall exposure to a single counterparty[114]. CCPs are in a better position to gather information and data to ensure ongoing oversight of risk monitoring and market transparency[115].

CCP may also use an amount of resources, if required, to cover any defaulting counterparty's obligations and absorb the related risks[116]. These resources are collectively known as "default waterfall", and ensure that all participants in the CCP arrangement, including the CCP itself, have enough incentives to support an orderly liquidation process in the event of default of a member[117]. To minimize the likelihood of members' default, CCPs lay down membership criteria to approve any institution as a clearing member[118].

The waterfall process is structured as follows:

(i) the CCP will try to auction off the defaulter's positions among other members;

(ii) it may then resort to the defaulting party's initial margins and "default fund" contributions;

(iii) if that is not enough, a CCP may use its own capital to absorb losses (the so-called "skin in the game");

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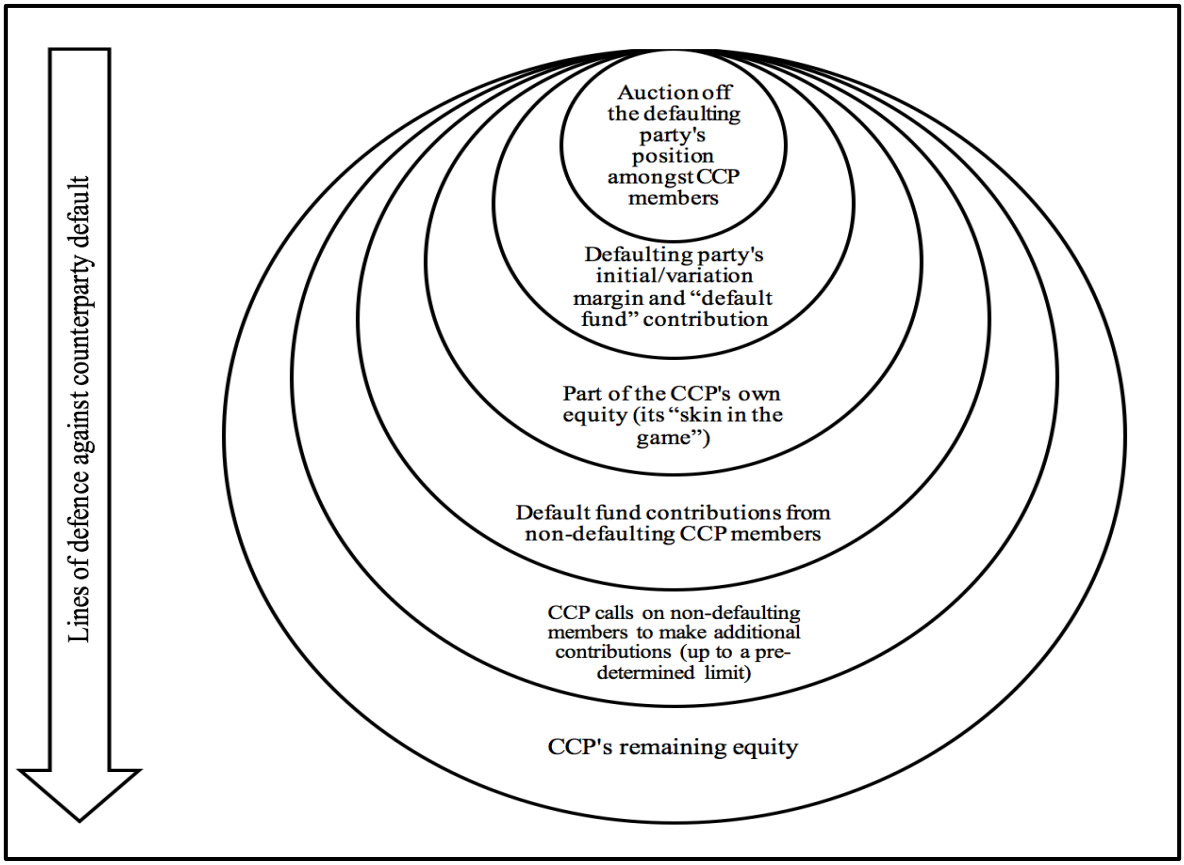
[110] R. Squire, *Clearinghouses as Liquidity Partitioning,* 99 Cornell Law Review, 2014, 857.
[111] P. Saguato, *The Ownership of Clearinghouses: When "Skin in the Game" is not Enough, the Remutualization of Clearinghouses*, 115.
[112] R. Comotto, *Frequently Asked Questions on Repo*, 24.
[113] P. Saguato, *The Ownership of Clearinghouses: When "Skin in the Game" is not Enough, the Remutualization of Clearinghouses*, 118.
[114] P. Saguato, *The Ownership of Clearinghouses: When "Skin in the Game" is not Enough, the Remutualization of Clearinghouses*, 118. For a dissenting opinion on the role played by CCPs in reducing counterparty credit risk, *see* D. Duffie, H. Zhu, *Does a Central Clearing Counterparty Reduce Counterparty Risk?*, Stanford University Graduate School of Business Research Paper No. 2022.
[115] P. Saguato, *The Ownership of Clearinghouses: When "Skin in the Game" is not Enough, the Remutualization of Clearinghouses*, 119.
[116] H. McVeA, *Central Counterparties and Sale and Repurchase Agreements: Regulating Financial Markets in the Light of Yet Another "False Dawn"*, 119.
[117] H. McVeA, *Central Counterparties and Sale and Repurchase Agreements: Regulating Financial Markets in the Light of Yet Another "False Dawn"*, 119.
[118] S. Wu, H. Nabilou, *Repo Markets across the Atlantic: Similar but Unalike*, 24.

(iv) if that is not sufficient, the losses are mutualized amongst other non-defaulting members;

(v) if the latter resources are also insufficient, the CCPs will absorb losses through its remaining equity; however, if the CCP's equity buffer is not enough the CCP itself will default[119].

The following diagram better clarifies the mechanics of a default waterfall.

The structure of a "default waterfall":[120]



Despite the abovementioned benefits, central clearing counterparties also have downsides in clearing repurchase agreements. For example:

(i) CCPs could be a potential source of systemic risk if all trading activities are too concentrated;

(ii) the extensive use of CCPs entails a collective reliance on a limited array of risk management tools, which may generate negative shocks to the financial system;

[119] H. McVeA, *Central Counterparties and Sale and Repurchase Agreements: Regulating Financial Markets in the Light of Yet Another "False Dawn"*, 119.
[120] The diagram is drawn from H. McVeA, *Central Counterparties and Sale and Repurchase Agreements: Regulating Financial Markets in the Light of Yet Another "False Dawn"*, 120.

(iii) CCPs tend to provide netting for certain products or asset classes only, thus the number of benefitted financial products in the market is low;

(iv) initial margins imposed by CCPs are higher if compared to market practice while remuneration tends to be lower, thereby increasing funding costs;

(v) CCPs may contribute to collateral shortages in the financial system as CCPs generally accept a limited range of top-quality assets, thereby draining available reserves[121].

In addition, the benefits of collateral rehypothecation are simply not available when using a CCP[122]. Liquidity risk does not disappear, but rather it is moved to, and concentrated within, the clearinghouse with the consequence that it may become even more concerning[123]. Because systemic risk may potentially arise from CCPs' core functions and operations, additional work has been undertaken at international level to develop basic principles on a common recovery and resolution regimes for CCPs considered too-big-too-fail[124].

The regulatory toolkit both in Europe and in the US is intended to balance these costs and benefits of central clearing counterparties. In particular, in the EU framework, the European Market Infrastructure Regulation (EMIR)[125] sets out the relevant rules for CCPs established in EU Member States. To this end, Title III of EMIR[126] requires clearinghouse to be authorized by competent authorities in the Member State where they operate, to have a solid capital base in order to face potential risks and to adopt appropriate corporate governance structures[127]. Nowadays, around 70% of the European repo market is cleared through CCPs, using electronic repo-trading systems[128]. While the EU

[121] R. Comotto, *Frequently Asked Questions on Repo*, 24-25. For a discussion of the limits surrounding central clearing, *see also* H. Scott, *Interconnectedness and Contagion. Financial Panics and the Crisis of 2008*, 67-68,

[122] J. Cullen, *The Repo Market, Collateral and Systemic Risk: in Search of Regulatory Coherence,* 102.

[123] S. Wu, H. Nabilou, *Repo Markets across the Atlantic: Similar but Unalike*, 24. For an overview of the problems associated with the use of CCPs, *see* H. McVeA, *Central Counterparties and Sale and Repurchase Agreements: Regulating Financial Markets in the Light of Yet Another "False Dawn"*, 121 ff. *and also* M. J. Roe, *Clearinghouse Overconfidence,* 101 California Law Review, 2013, 1641 ff.

[124] H. McVeA, *Central Counterparties and Sale and Repurchase Agreements: Regulating Financial Markets in the Light of Yet Another "False Dawn"*, 133. For a detailed overview of what has been done and what should still be achieved, *see* H. Nabilou, I. G. Asimakopoulos, *Examining the Prudential Regulation and Resolution Regimes for Central Clearing Counterparties in Europe*, 2.

[125] Regulation (EU) No. 648/2012 of the European Parliament and of the Council of 4 July 2012 on OTC derivatives, central counterparties and trade repositories.

[126] G. Ferrarini, P. Saguato, *Regulating Financial Market Infrastructures*, 23.

[127] G. Ferrarini, P. Saguato, *Regulating Financial Market Infrastructures*, 24. *See also* S. Wu, H. Nabilou, *Repo Markets across the Atlantic: Similar but Unalike*, 25, for a description of the functioning Article 45 EMIR in relation to a default situation.

[128] S. Wu, H. Nabilou, *Repo Markets across the Atlantic: Similar but Unalike*, 23. The most prominent European clearinghouses are LCH-Clearnet, Eurex Clearing, CC&G and MEFF. *Also see* L. Mancini, A. Ranaldo, J. Wrampelmeyer, *The Euro Interbank Repo Market.*

regulatory approach targets Financial Market Infrastructures specifically, in the United States the Dodd-Frank Act (*see infra para. 3.6.*) is generally devoted to regulating the financial industry in general, also covering CCPs[129]. For example, Title VII of the Dodd-Frank Act, along with a number of provisions enacted by the Commodity Futures Trading Commission (CFTC) - the independent US agency that regulates futures and options markets - require CCPs to be registered as Derivatives Clearing Organizations (DCOs)[130]. According to the CFTC, *"a derivatives clearing organization (DCO) is an entity that enables each party to an agreement, contract or transaction to substitute, through novation or otherwise, the credit of the DCO for the credit of the parties; arranges or provides, on a multilateral basis, for the settlement or netting of obligations; or otherwise provides clearing services or arrangements that mutualize or transfer credit risk among participants"*[131]. US rules aim at achieving financial stability, internal and external accountability and operational transparency through sophisticated models of corporate governance[132]. There is evidence that utilizing clearinghouses would reduce risk exposures in the US interdealer repo market[133]. Moreover, whereas legislations across the Atlantic provide for clearing of standardized derivatives via CCPs (under EMIR it is mandatory within the EU), in the EU and the US there is no mandatory central clearing requirement yet for securities financing transactions, including repos[134]. Finally, although CCPs do make the repo market more resilient by mitigating idiosyncratic risks, regulators and policy makers need to take into account that CCPs might not be able to prevent systemic risk when counterparties' defaults are correlated, moving only an array of risks from one group of systemically important institutions (*i.e.*, the repo market participants), to another (*i.e.*, the CCPs themselves)[135].

[129] G. Ferrarini, P. Saguato, *Regulating Financial Market Infrastructures*, 28.
[130] S. Wu, H. Nabilou, *Repo Markets across the Atlantic: Similar but Unalike*, 25.
[131] *See* https://www.cftc.gov/IndustryOversight/ClearingOrganizations/index.htm.
[132] G. Ferrarini, P. Saguato, *Regulating Financial Market Infrastructures*, 29. For a critical analysis of ownership models of clearinghouses, *see* P. Saguato, *The Ownership of Clearinghouses: When "Skin in the Game" is not Enough, the Remutualization of Clearinghouses*, 135 ff.
[133] S. Wu, H. Nabilou, *Repo Markets across the Atlantic: Similar but Unalike*, 26.
[134] S. Wu, H. Nabilou, *Repo Markets across the Atlantic: Similar but Unalike*, 26.
[135] H. McVeA, *Central Counterparties and Sale and Repurchase Agreements: Regulating Financial Markets in the Light of Yet Another "False Dawn"*, 136.

3.3. *The use of repos in central banks' open market operations*

The idea of repo transactions as monetary policy instruments gained reputation among central bankers because of the market size and their role in funding different segments of financial systems[136]. Monetary policy might operationally be defined as the set of actions taken by a monetary authority to affect the supply and cost of money and credit in a given economy[137]. To this end, repos provide central banks with a relatively precise instrument to control and manage liquidity, serving as a tool for signaling the evolving monetary policy stance and providing information on short-term interest rate expectations[138]. Repo transactions share a vast array of features enabling central banks to design their market operations in line with their monetary policies, namely:

(i) a low credit risk resulting from collateralization;

(ii) flexibility in relation to amounts, frequency and interest rate, as to tailor market operations according to current liquidity conditions;

(iii) repos will not affect securities prices, since central banks only use very high-quality collateral;

(iv) if compared to other financial instruments, repos are traded in widely accessible and established markets[139].

Against this background, central banks all over the world employ repurchase agreements to intervene in money markets, using these instruments as a channel for implementing monetary policy and as a tool to provide emergency assistance in times of distress to individual banks or the banking system as a whole - *i.e.* acting as lenders of last resort (LOLR)[140]. On the one hand, repos may increase the amount of liquidity into the banking market by injecting cash through reverse repos collateralized with high

[136] Euroclear, *Understanding Repo and the Repo Market*, 21.
[137] A legal definition of monetary policy is absent in central bank statutes, which generally only state that the central bank is in charge of it by enumerating the objectives and instruments available to the bank to pursue the policy itself. Operationally, it refers to the set of actions taken by a monetary authority to affect the supply and cost of money and credit. For a detailed overview of monetary policy *see* R. Lastra, *International Financial and Monetary Law*, Oxford, Oxford University Press, 37 ff.
[138] Bank for International Settlements, *Implications of Repo Markets for Central Banks,* 1999, 11, available at https://www.bis.org/publ/cgfs10.htm.
[139] Bank for International Settlements, *Implications of Repo Markets for Central Banks*, 12.
[140] R. Comotto, *Frequently Asked Questions on Repo*, 8. Historically, the Federal Reserve was the first central to use repos in the 1920s. The Bank of Canada started using repos in 1953, while most countries experienced operations in the 1970s. For instance, the Bank of England started using them in 1997, the Bank of Japan in 1997 and the Swiss National Bank only in 1998, *see* Bank for International Settlements, *Implications of Repo Markets for Central Banks*, 11. In addition, central banks may use repos to commercially invest in foreign exchange reserves.

quality assets[141]. On the other hand, under classic bilateral repos they may dry liquidity up by taking cash off through sales of bonds[142]. In doing so, central banks influence short-term interest rates by "reverse-repoing" eligible collateral from banks to reduce or increase their reserves[143]. In times of financial distress and temporary liquidity squeeze, central banks may react by entering into so-called "open market operations" ("OMOs") in order to provide banks with liquidity in exchange for bank reserves[144].

Open market operations are considered nowadays as the main tool of monetary policy, the purpose of which ensure stable inflationary growth and stability of prices[145]. In normal market conditions, OMOs are relatively smaller in scale than repo trades between commercial institutions, although they are still capable to influence interest rate expectations among market participants[146]. Conversely, if the shortage of liquidity is severe, central bankers might be willing to intervene more frequently, to increase their lending activities or even to widen the range of eligible collateral that market participants are able to post in the trade[147]. These operations will usually take place periodically (daily or weekly,) using auction mechanisms, the features of which reflect broad market practices of a given central bank in each jurisdiction[148]. While the ultimate target of monetary policy is price stability, the intermediate target is typically a specific short-term interest rate - in fact, a decline in the target rate stimulates economic growth, whereas an increase can cause inflation - although in other cases it could be a specific exchange rate or the price of gold[149].

It is important to clarify that although OMOs do improve banks' liquidity, the primary purpose is not to directly benefit banks, but rather to expand or reduce the money supply in the economy, to adjust interest rates and to either stimulate or restrict the availability of credit in the financial system[150]. That being said, the underlying rationale of these transmission channels is that the same private actors that receive from central banks are likely to distribute these funds to the whole economy through their ongoing

[141] C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 4.
[142] C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 4. *See also* Bank for International Settlements, *Implications of Repo Markets for Central Banks*, 11-12, where it is pointed out that injections of liquidity are reversed when repo matures so that the central bank can absorb liquidity simply by not renewing a fraction of the repos falling due. For this mechanism to work it is important to ensure that sufficient stocks of repos mature on appropriate days.
[143] J. Cullen, *The Repo Market, Collateral and Systemic Risk: in Search of Regulatory Coherence*, 91.
[144] J. Cullen, *The Repo Market, Collateral and Systemic Risk: in Search of Regulatory Coherence*, 91.
[145] Euroclear, *Understanding Repo and the Repo Market*, 21.
[146] Euroclear, *Understanding Repo and the Repo Market*, 21.
[147] Euroclear, *Understanding Repo and the Repo Market*, 22.
[148] Euroclear, *Understanding Repo and the Repo Market*, 22.
[149] S. Valdez, P. Molyneux, *An Introduction to Global Financial Markets*, 57.
[150] M. Barr, H. Jackson, M. Tahyar, *Financial Regulation: Law and Policy*, 874.

banking operations[151]. In the event of wide financial instability, repos may also be used to fund longer, larger-scale monetary policy programs[152]. In this regard, initiatives targeting large scale asset purchases ("LSAPs") - for example, unconventional monetary policy instruments such as the Quantitative Easing (QE)[153] which incentivize loan origination by providing additional liquidity - may affect the functionality of the repo market in two ways:

(i) banks' balance sheets increase as a result of their greater exposure to central banks, reducing incentives for holders of the central bank reserves to engage in other financing activities, including repos;

(ii) large amounts of high-quality collateral are absorbed from the banking system and capitalized: this is because when a bond is pledged by a bank to obtain central bank reserves within a QE program, it can no longer be used for other repo or rehypothecation activities[154].

Taking into account these premises, we are going to discuss the role of repurchase agreements in the open market operations of two major central banks operating across the transatlantic framework, the US Federal Reserve System and the European System of Central Banks.

[151] M. Barr, H. Jackson, M. Tahyar, *Financial Regulation: Law and Policy*, 888.
[152] J. Cullen, *The Repo Market, Collateral and Systemic Risk: in Search of Regulatory Coherence*, 91.
[153] Quantitative Easing is the process whereby a central bank purchases government bonds on a massive scale to inject liquidity intro the financial system and it is largely used by the Fed, the Bank of England, the ECB and the Bank of Japan as a tool for monetary policy implementation when interest rates are so low, they cannot be reduced further. Essentially, banks pledge their securities' holding in exchange for central bank reserves. While QE works much like OMOs, it is considered an unconventional monetary policy tool because the assets purchased include not only US Treasuries but a wider range of collateral, including MBSs issued by government sponsored enterprises, *see* S. Valdez, P. Molyneux, *An Introduction to Global Financial Markets*, 503. For a detailed description of the rationale for QE programs of the abovementioned central banks, *see* B. W. Fawley, C. J. Neely, *Four Stories of Quantitative Easing,* 95(1) Federal Reserve Bank of St. Louis Review, 2013, 51 ff.
[154] J. Cullen, *The Repo Market, Collateral and Systemic Risk: in Search of Regulatory Coherence*, 107; *see also* Bank for International Settlements Committee on the Global Financial System, Repo Ma*rket Functioning,* CGFS Papers No. 59, 2017, 16-17.

3.3.1. *The Federal Reserve System*[155]

Historically, the Federal Reserve System has been the first central bank in the world to use repurchase agreements and reverse repo facilities as a monetary policy tool[156]. In the US, the Federal Reserve System implements monetary policy to fulfill its dual mandate to maintain stable prices and full employment[157]. The Federal Reserve System is composed by a Board of Governors and twelve regional Federal Reserve Banks[158]. The System itself is not a legal entity, as only the Board of Governors and the regional Federal Reserve Banks have legal personality, which operationally conduct the implementation of monetary policy and execute central banking functions[159].

The primary tool of the Federal Reserve System to regulate liquidity is the use of temporary open market operations[160] in order to purchase or sell US Treasuries, trading with so-called "primary dealers" - *i.e.* the broker dealers that transact directly with the Fed[161]. Most importantly, OMOs are functionally related with the Fed's role as Lender of Last Resort (LOLR) in the United States[162]. The Federal Reserve's open market operations aim at influencing the level of reserves or liquidity in the economy to meet the targeted Federal Funds Rate - *i.e.* the rate charged by banks to one another for overnight loans on balances held at a Federal Reserve Bank - mandated by the Federal Open Markets

[155] For an overview of the history, functioning and future of the Federal Reserve System, *see* T. Cooley, K. Schoenholtz, G. D. Smith, R. Sylla, P. Wachtel, *The Power of Central Banks and the Future of the Federal Reserve System,* in V. Acharya, T. Cooley, M. Richardson, I. Walter (eds.), *Regulating Wall Street. The Dodd-Franck Act and the New Architecture of Global Finance,* Hoboken, Wiley, 2011, 51 ff. *and also* M. Barr, H. Jackson, M. Tahyar, *Financial Regulation: Law and Policy*, 867 ff. See also the Fed's website, https://www.federalreserve.gov.

[156] Bank for International Settlements, *Implications of Repo Markets for Central Banks*, 11. For an historical overview, *see* K. Garbade, *Repurchase Agreements as an Instrument of Monetary Policy at the Time of the Accord,* Federal Reserve Bank of New York Staff Reports No. 780, 2016.

[157] Section 2A of the 1913 Federal Reserve Act, *see* T. Cooley, K. Schoenholtz, G. D. Smith, R. Sylla, P. Wachtel, *The Power of Central Banks and the Future of the Federal Reserve System*, 65. *See also* H. Davies, D. Green, *Banking on the Future. The Fall and Rise of Central Banking,* Princeton, Princeton University Press, 2010, 148 ff. On the contrary, the European Central Bank has a single mandate to maintain price stability.

[158] The twelve regional districts are located in Boston, New York, Philadelphia, Cleveland, Richmond, Atlanta, Chicago, St. Louis, Minneapolis, Kansas City, Dallas, San Francisco.

[159] R. Lastra, *International Financial and Monetary Law*, 65.

[160] Section 14 of the 1913 Federal Reserve Act.

[161] M. Barr, H. Jackson, M. Tahyar, *Financial Regulation: Law and Policy*, 873. Specifically, if the Fed wants to increase the money supply, *i.e.* liquidity, will cause one the Federal Reserve Banks to purchase the Treasuries from a primary dealer. *Also see* Federal Reserve Bank of New York, *Open Market Operations During 2017,* 2018, available at https://www.newyorkfed.org/medialibrary/media/markets/omo/omo2017-pdf.pdf.

[162] M. Barr, H. Jackson, M. Tahyar, *Financial Regulation: Law and Policy,* 873.

Committee (FOMC)[163]. Higher levels of money supply in fact would generally lead to lower interest rates and vice versa[164]. To this end, the Federal Reserve Bank of New York operational trading platform, the so-called Open Markets Trading Desk, executes repos to increase (and reverse repos to decrease) the money supply in the banking system[165].

With respect to classic repos, the Federal Reserve typically conducts the operation on overnight basis using an auction mechanism accepting competitive bids for three types of collateral, namely Treasury general collateral, agency debentures and agency Mortgage-Backed Security (MBS)[166]. The winning bids receive a stop-out rate - the stop-out price is the lowest auction price at which Treasury bills are sold [167] - but the transaction is actually settled in the tri-party market[168]. The mechanics of this operation lowers the repo overnight rate in two complementary ways. On the one hand, when the Federal Reserve buys collateral, it simultaneously provides cash to the counterparty[169]. This, in turn, increases the counterparty's cash position, thereby achieving greater money supply that eventually lowers the overnight interest rate[170]. On the other hand, this operation ultimately removes a large amount of collateral from the banking system as the settlement happens in the triparty market, decreasing the supply of collateral[171].

With respect to reverse repos, the Federal Reserve utilizes the Overnight Reverse Repo Facility ("ONRRP"), which is a temporary, supplementary monetary tool, to engage in bilateral transactions where bonds are sold to private counterparties with the aim of replacing cash in the financial system with securities, this way raising overnight interest rates through a decrease of money supply[172]. The ONRRP provides eligible repo market participants - including primary dealers, money market mutual funds, banks and government-sponsored enterprises - with the opportunity to invest their cash with the Federal Reserve on a collateralized basis[173]. To better understand the importance of the reverse repo facility for the FOMC, one should consider that during the last financial

[163] The FOMC is composed by the President of the Federal Reserve Bank of New York, the seven members of the Board of Governors and an annually rotating group of Presidents from four other Federal Reserve Banks.
[164] K. Schultz, J. Bockian, *Repurchase Agreements*, 200.
[165] K. Schultz, J. Bockian, *Repurchase Agreements*, 200. A note on the terminology: when the Fed announces a repo operation, it is in fact the Fed's counterparty that is doing the repo, so that the Fed will buy collateral and sell cash. On the contrary, when the Fed conducts a reverse repo, the counterparty is actually buying and reversing in the securities sold by the Fed.
[166] K. Schultz, J. Bockian, *Repurchase Agreements,* 201.
[167] The stop-out price is the lowest auction price at which Treasury bills are sold.
[168] K. Schultz, J. Bockian, *Repurchase Agreements*, 201.
[169] K. Schultz, J. Bockian, *Repurchase Agreements*, 201.
[170] K. Schultz, J. Bockian, *Repurchase Agreements*, 201.
[171] K. Schultz, J. Bockian, *Repurchase Agreements*, 201.
[172] K. Schultz, J. Bockian, *Repurchase Agreements*, 201.
[173] V. Baklanova, A. Copeland, R. McCaugrin, *Reference Guide to U.S. Repo and Securities Lending Markets*, 18.

crisis the US central bank embarked on a massive program of emergency liquidity assistance, increasing its balance sheet to $4.5 trillion, by implementing three rounds of quantitative easing at zero interest rate[174]. This massive expansion of Federal Reserve's balance sheet was sustainable because the Federal Reserve was - and is still - viewed as a risk-free counterparty while the posted collateral were mostly risk-free US Treasuries bonds[175]. According to the data available, as of 2017 the daily average in the ONRRP facility was higher than previous years, reflecting an increase in demand by money market mutual funds[176]. Counterparties to the Fed included government money market funds, prime and tax-exempt money market funds, government sponsored enterprises, primary dealers and banks[177].

3.3.2. *The European System of Central Banks*[178]

The situation in the European Union is more composite. The EU monetary policy institutional framework is composed by the European Central Bank ("ECB") and the National Central Banks ("NCBs") of the EU Member States. The ECB and the NCBs collectively form the European System of Central Banks (ESCB)[179]. The NCBs are both the operational arms of the ESCB when carrying out operations related to the tasks of the

[174] K. Schultz, J. Bockian, *Repurchase Agreements*, 201. The three programs are described by A. Krishnamurthy, S. Nagel, D. Orlov, *Sizing Up Repo,* 69(6) The Journal of Finance, 2014, 2411: (i) the Primary Dealer Credit Facility (PDCF) set up in March 2008, was a loan facility that funded primary dealers in exchange for any triparty eligible collateral; (ii) the Term Securities Lending Facility (TSLF) set up also in March 2008, with the aim of loaning Treasuries from the Fed's portfolio in exchange for investment-grade collateral; (iii) Maiden Lane I, II, III, set up in various dates: the Fed made loans to Special Purpose Vehicles that held private-label Asset Backed Securities. For an overview of the TSLF and a comparison with the similar Special Liquidity Scheme (SLS) adopted by the Bank of England during the financial crisis, *see* P. Hördal, M. King, *Developments in the Repo Markets during the Financial Turmoil,* Bank for International Settlements Quarterly Review, 2008, 49 ff.

[175] K. Schultz, J. Bockian, *Repurchase Agreements*, 201.

[176] Federal Reserve Bank of New York, *Open Market Operations During 2017*, 7.

[177] Federal Reserve Bank of New York, *Open Market Operations During 2017*, 7.

[178] The legal basis of the European Central Bank are the Treaty on the Functioning of the European Union (TFEU) and the Statute of the European System of Central Banks and of the European Central Bank. For a thorough overview of the history, functioning and purposes of European Central Bank, *see* R. Lastra, *International Financial and Monetary Law*, 247 ff.; H. Davies, D. Green, *Banking on the Future. The Fall and Rise of Central Banking*, 182 ff.; R. Lastra, *The Evolution of the European Central Bank,* Queen Mary University of London Legal Studies Research Paper No. 99, 2012, available at https://ssrn.com/abstract=2020545.

[179] The National Central Banks are the sole shareholders of the ECB's capital structure. For a thorough analysis of the ESCB, *see* H. Siekmann, *The Legal Framework for the European System of Central Banks,* House of Finance White Paper No. 26, 2013, available at https://safe-frankfurt.de/research/researchers/researchers-details/showauthor/115-siekmann.html.

ESCB and national agencies when performing non-ESCB functions[180]. Pursuant to Article 282(1) of the Treaty on the Functioning of the European Union (TFEU), *"[...] The European Central Bank, together with the national central banks of the Member States whose currency is the euro, which constitute the Eurosystem, shall conduct the monetary policy of the Union [...]. The primary objective of the European System of Central Banks shall be to maintain price stability"*[181]. Whereas the ESCB operates as the central banking system of the European Union as a whole, only the so-called "Eurosystem" is the central banking authority of the euro area[182]. In this sense, there is a single monetary policy targeting those Member States whose currency is the euro[183]. Although the EU monetary policy is considered indivisible, the ECB is charged with monetary policy decision-making functions, while the operational implementation is decentralized to the nineteen NCBs which are part of the Eurosystem, according to guidelines and instructions set out in Frankfurt[184]. To this purpose, Article 12.1(3) of the ESCB Statute states "*the ECB shall have recourse to the national central banks to carry out operations which form part of the tasks of the ESCB".*

Against this background, the ECB is empowered with standard and non-standard monetary policy tools to ensure the transmission of monetary policy throughout the financial system[185]. The legislative framework is set out in Article 18 of the ESCB Statute, which provides that *"in order to achieve the objectives of the ESCB and to carry out its tasks, the ECB and the national central banks may operate in the financial markets by buying and selling outright (spot and forward) or under repurchase agreement and by lending or borrowing claims and marketable instruments, whether in euro or other currencies, as well as precious metals [...]".* The ECB's role as a liquidity provider for

[180] R. Lastra, *International Financial and Monetary Law*, 66.
[181] Price stability is the primary objective of the ECB. However, other objectives are spelt out in Article 127 of the TFEU: *The primary objective of the European System of Central Banks (hereinafter referred to as "the ESCB") shall be to maintain price stability. Without prejudice to the objective of price stability, the ESCB shall support the general economic policies in the Union with a view to contributing to the achievement of the objectives of the Union as laid down in Article 3 of the Treaty on European Union. The ESCB shall act in accordance with the principle of an open market economy with free competition, favouring an efficient allocation of resources, and in compliance with the principles set out in Article 119. The basic tasks to be carried out through the ESCB shall be:(i) to define and implement the monetary policy of the Union; (ii) to conduct foreign-exchange operations consistent with the provisions of Article 219; (iii) to hold and manage the official foreign reserves of the Member States; iv) to promote the smooth operation of payment systems [...].*
[182] R. Lastra, *The Evolution of the European Central Bank,* 2. The Eurosystem and the ESCB will co-exist as long as there are EU member states outside the euro area.
[183] R. Lastra, *The Evolution of the European Central Bank,* 6. The currents states adopting the euro as their currency are Belgium, Germany, Greece, Spain, Estonia, Ireland, France, Italy, Cyprus, Luxembourg, Malta, the Netherlands, Austria, Portugal, Slovenia, Slovakia, Finland, Latvia, Lithuania.
[184] R. Lastra, *The Evolution of the European Central Bank*, 6.
[185] L. Amorello, *Bail-In or Bail-Out? A Survey on the ECB's Role of "Bank-Loss-Absorber of Last Resort",* 23(2) Diritto del Commercio Internazionale, 2018, 405.

the purposes of Article 18 proved crucial during the 2008 financial crisis and the European sovereign debt crisis[186]. Open market operations, among the available monetary policy instruments, play a pivotal role in allowing the ECB to conduct liquidity-providing transactions aiming at financing credit institutions either on a short-term or long-term basis[187]. To this end, repurchase agreements are generally utilized within four categories of open market transactions, namely:

(i) "*main refinancing operations*" (MROs), are executed weekly to steer interest rates, manage market liquidity and signal the actual monetary policy stance. MROs are conducted by NCBs on the basis of standard tenders and substantially provide the bulk of refinancing to the financial sector;

(ii) "*longer-term refinancing operations*" ("LTROs"), are renewed on a monthly basis and have longer maturities, though they are not intended to send interest rate signals to the market but rather to provide additional funding to the market. LTROs are similarly conducted by the Eurosystem based on standard tender procedures;

(iii) "*fine-tuning operations*", can be either executed as reverse repo transactions or outright transactions and are conducted on an *ad hoc* basis to manage market liquidity and steer interest rates, smoothing the effects of potential fallouts caused by liquidity fluctuations. Fine-tuning operations are executed by the Eurosystem through quick tenders or bilateral procedures;

(iv) "*structural operations*", are meant to adjust the structural position of the Eurosystem vis-à-vis the financial sector and are carried out through standard tenders[188].

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[186] R. Lastra, *The Evolution of the European Central Bank,* 9. The ECB has used both conventional and unconventional instruments of monetary policy in response to both crises. For an overview of the measures adopted in this regard *see* R. Lastra, *International Financial and Monetary Law*, 256 ff. To mention a few, the ECB enacted the "enhanced credit support" in 2008, the Cover Bonds Purchase Program in 2009, the Securities Market Program in 2010, the "long-term refinancing operations (LTRO)" in 2011, but most importantly the Outright Monetary Transactions (OMT) in August 2012. The latter has been subject of much controversy, to such an extent that the legality of it has been challenged in the German Constitutional Court. *See* H. Siekmann*., The European Central Bank's Outright Monetary Transactions and the Federal Constitutional Court of Germany,* House of Finance White Paper No. 4, 2015; H. Siekmann, *The Legality of Outright Monetary Transactions (OMT) of the European System of Central Banks,* Institute for Monetary and Financial Stability Working Paper No. 90, 2015. For an overview of the measures adopted by the ECB in comparison with those adopted by the Fed and the Bank of England, *see* P. Hördal, M. King, *Developments in Repo Markets during the Financial Turmoil,* 49 ff.

[187] L. Amorello, *Bail-In or Bail-Out? A Survey on the ECB's Role of "Bank-Loss-Absorber of Last Resort"*, 407. In the interests of providing fuller information, the Eurosystem also dispose of standing facilities to satisfy the banking system with its short-term liquidity needs. These facilities include the "Marginal Lending Facility" and the "Deposit Facility". Specifically, the Marginal Lending Facility allows credit institutions to enter a repurchase agreement with the ECB in order to obtain overnight liquidity at pre-defined interest rates.

[188] Bank for International Settlements, *Implications of Repo Markets for Central Banks*, 13-14. The information is also drawn from https://www.ecb.europa.eu/mopo/implement/html/index.en.html. Specific data is available here: https://www.ecb.europa.eu/mopo/implement/omo/html/top_history.en.html. For an interesting insight on European market participants complaints regarding the ECB monetary policy, *see* International Capital Market Association, *Perspectives from the Eye of the Storm. The Current State and*

The abovementioned operations are conducted mainly through reverse transactions that are executed by entering into a repurchase agreement where the ownership of an eligible asset is transferred to the ECB from a credit institution: the credit institutions, in turn, agrees to repurchase it back in the future[189]. The trading terms are governed by the guidelines of the ECB and the NCBs, as they have to assess contractual and legal arrangements, along with the formalities and procedures of the repo transaction[190]. In addition, the ECB's collateral management is of utmost importance in the implementation of monetary policy, since the ECB and the NCBs need to administer the risks associated with their credit operations by means of collateralization[191]. Against this backdrop, credit institutions need to post eligible assets in order to obtain funds and provide a layer of protection for the Eurosystem against credit risk, market risk and liquidity risk in accordance with the harmonized collateral framework set by the ECB Guideline (EU) 2015/510[192]. Finally, it is worth mentioning the accounting treatment of open market transactions. Reverse repo transactions entered by the ECB are recorded as collateralized outward loans on the asset side of the ECB's balance sheet for the amount of the loan, while the securities pledged as collateral by the credit institutions and acquired by the ECB under the repo agreement remain on the bank's balance sheet[193]. As a consequence, when a bank enters into a repurchase agreement to obtain liquidity there is no transfer of collateral to the ECB's balance sheet[194].

Future Evolution of the European Repo Market, 2015, 33 ff., available at https://www.icmagroup.org/resources/icma-publications-and-services/icma-reports/.

[189] L. Amorello, *Bail-In or Bail-Out? A Survey on the ECB's Role of "Bank-Loss-Absorber of Last Resort"*, 408. Reverse transactions may also be executed by using collateralized loans in which the ECB takes a security interest on the collateral, while the ownership of the assets is withheld by the credit institution until the moment of the obligation performance.

[190] L. Amorello, *Bail-In or Bail-Out? A Survey on the ECB's Role of "Bank-Loss-Absorber of Last Resort"*, 408.

[191] L. Amorello, *Bail-In or Bail-Out? A Survey on the ECB's Role of "Bank-Loss-Absorber of Last Resort"*, 409. For an overview of the role of collateral in the ECB's monetary policy, *see* D. Gabor, *The Power of Collateral: the ECB and Bank Funding Strategies in Crisis,* 2012, available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2062315.

[192] L. Amorello, *Bail-In or Bail-Out? A Survey on the ECB's Role of "Bank-Loss-Absorber of Last Resort"*, 409.

[193] L. Amorello, *Bail-In or Bail-Out? A Survey on the ECB's Role of "Bank-Loss-Absorber of Last Resort"*, 416. For an overview of the legal framework governing accounting reporting, *see* ECB Guideline (EU) 2016/2249.

[194] L. Amorello, *Bail-In or Bail-Out? A Survey on the ECB's Role of "Bank-Loss-Absorber of Last Resort"*, 416.

3.4. *Repo and shadow banking*

Before digging into the transatlantic regulatory framework related to the repo market, we need to highlight that repurchase agreements are strictly intertwined with what has come to be known as the "shadow banking" system. To better understand what shadow banking is and to what extent is material to our research, we may rely on three complementary approaches that may offer a functional definition:

(i) shadow banking may be defined by the activities (excluding traditional banking activities) constituting "shadow banking activities" themselves, which include maturity, liquidity and credit transformation requiring a *private or public backstop*[195] to operate;

(ii) operationally, shadow banking may be defined by the "non-bank entities" carrying out credit intermediation, most notably money market mutual funds and alternative investment funds;

(iii) shadow banking may also be defined by the instruments through which shadow banking activities are carried out, especially credit instruments providing for liquid liabilities that are prone to bank-like runs and may generate systemic risk concerns, such as repurchase agreements[196].

Although providing a common definition of shadow banking is not straightforward, it is broadly understood as the asset and maturity transformation carried out by entities not regulated (or lightly regulated) which largely make use of financial products and services that replicate the functions of traditional banking, including repo activities[197].

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[195] *See* A. M. Pacces, H. Nabilou, *The Law and Economics of Shadow Banking*, in I.H-Y. Chiu, I. G. MacNeil (eds.), *Research Handbook on Shadow Banking. Legal and Regulatory Aspects,* Cheltenham, Edward Elgar Publishing, 2018, 11, where a backstop is defined as a last-resort risk-absorption commitment, either private or public. The former may be a credit risk guarantee by a bank while the latter is traditionally the liquidity injected in the system by central banks through various programs.

[196] A. M. Pacces, H. Nabilou, *The Law and Economics of Shadow Banking*, 10-11.

[197] M. Barr, H. Jackson, M. Tahyar, *Financial Regulation: Law and Policy*, 23. For a thorough overview of shadow banking, *see inter alia* A. M. Pacces, H. Nabilou, *The Law and Economics of Shadow Banking*; M. Ricks, *Money and (Shadow) Banking: a Thought Experiment,* 31 Review of Banking & Financial Law, 2011, 731 ff.; G. Gorton, A. Metrick, *Regulating the Shadow Banking System,* 2010, available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1676947; M. Ricks, *Regulating Money Creation After the Crisis,* 1 Harvard Business Law Review, 2011, 84 ff.; M. Ricks, *Shadow Banking and Financial Regulation,* 2010, Columbia Law and Economics Working Paper No. 370; E. Jeffers, D. Plihon, *What Is So Special About European Shadow Banking?*, Foundation for European Progressive Studies, 2016; D. Gabor, *Shadow Interconnectedness: the Political Economy of (European) Shadow Banking,* 2013, available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2326645; H. Nabilou, A. Prüm, *Shadow Banking in Europe: Idiosyncrasies and their Implications for Financial Regulation,* 2017, available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=303583; R. Comotto, *Shadow Banking and Repo,* International Capital Market Association, 2012, available at https://www.icmagroup.org/Regulatory-Policy-and-Market-Practice/repo-and-collateral-markets/icma-ercc-publications/icma-ercc-reports/shadow-banking-and-repo/; J. Armour, D. Awrey, P. Davies, L. Enriques, J. N. Gordon, C. Mayer, J. Paine, *Principles of Financial Regulation*, 444 ff.; S. Valdez, P. Molyneux, *An Introduction to Global*

Repos are not only shadow banking instruments as they are not employed exclusively by shadow banking entities[198]. Rather, as mentioned earlier, repos are likewise used by regulated institutions, such as commercial banks and securities firms, especially in the European market, whereas money market mutual funds, a classic example of shadow banking entities, dominate the US market[199]. Indeed, regulatory restrictions on liquidity and leverage affecting banks' operations have shifted the traditional role of repos as a shadow banking tool[200]. Specifically, the Basel III framework (*see infra para. 3.5. and 3.6.*) requires banks to hold more capital and liquidity buffers, so that credit institutions have a lower availability of cash and collateral to trade in repos.

The role of repos in the shadow banking sector has raised (and still raises) concerns with respect to financial stability. In the years before the last financial crisis, repos gained momentum as an essential source of liquidity for the shadow banking system, allowing market participants to raise short-term funding and to direct the funds into relatively illiquid long-term investments - *e.g.* home mortgage loans or corporate loans[201]. In other words, repo market participants were translating short-term funding into long-term investments. This maturity transformation, along with the related increase in leverage of the entities involved, enhanced the interconnectedness of the financial system[202]. This interconnectedness played a role of key accelerator to the financial turmoil[203]. This was due to the greatest interdependency of the shadow banking system with the wholesale funding market (if compared to the traditional banking system) which can be summarized as follows:

(i) wholesale liabilities such as repos are riskier than traditional bank deposits;

(ii) wholesale funding is less regulated;

Financial Markets, London, 115-117; 450-451; H. Scott, *Interconnectedness and Contagion. Financial Panics and the Crisis of 2008*, 79 ff., available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2178475.

198 R. Comotto, *Frequently Asked Questions on Repo*, 32.

199 R. Comotto, *Frequently Asked Questions on Repo*, 32.

200 A. M. Pacces, H. Nabilou, *The Law and Economics of Shadow* Banking, 16.

201 A. Krishnamurthy, S. Nagel, D. Orlov, *Sizing Up Repo,* 69(6) The Journal of Finance, 2014, 2387.

202 P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 39. However, shadow banking offers efficiency gains in the financial market from specialization and comparative advantage over traditional banks, including but not limited to: (i) lowering costs; (ii) improving the availability of credit; (iii) transferring credit risk by diversifying borrowers; (iv) involving the market in the supervision of credit institutions; (v) decentralizing the financial system to make it more robust in case of shocks. *See also* R. Comotto, *Shadow Banking and Repo*, 11.

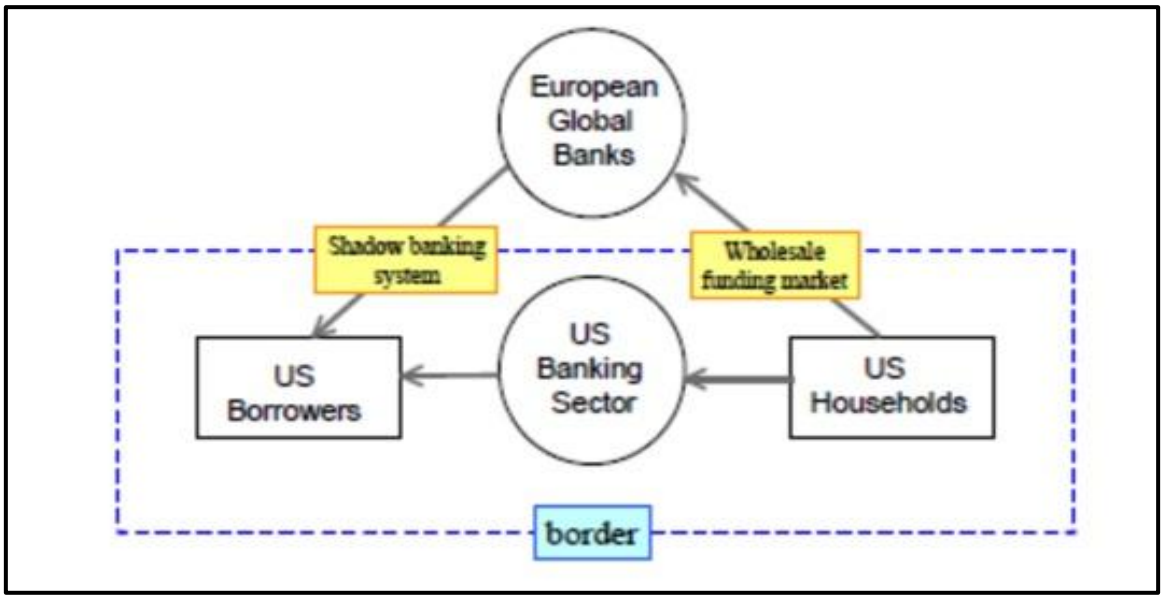
203 *See inter alia* G. Gorton, A. Metrick, *Securitized Banking and the Run on Repo,* National Bureau of Economic Research Working Paper No. 15223, 2009; G. Gorton, A. Metrick, *Who Ran on Repo?,* National Bureau of Economic Research Working Paper No. 18455, 2012; G. Gorton, *Slapped in the Face by the Invisible Hand: Banking and the Panic of 2007,* 2009, available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1401882.

(iii) shadows banks are more dependent on repo funding than traditional banks on deposits, since the latter can more easily diversify their funding strategies;

(iv) the wholesale market is not directly or permanently supported by any official "safety net", such as any deposit insurance or access to the lender-of-last resort function of a monetary authority[204].

While the mainstream literature found the origin of the financial crisis in the collapse of the US financial system, we should not forget that the European banking system was widely entangled with the "shadow banking intermediation" of credit flows from US householders to US borrowers and largely benefited from short-term secured dollar funding from US money market funds, mostly through repos and prime brokerage financing[205]. Moreover, EU global banks were largely active in the US financial system, taking advantage of loosening credit conditions[206]. The following diagram better explains the interconnectedness.

The interconnectedness of EU and US wholesale funding markets and shadow banking system:[207]



The main rationale to regulate shadow banking activities and the repos therein is the concern about systemic risk, which can materialize directly from credit intermediation or indirectly through the interconnectedness with the traditional banking system[208].

[204] R. Comotto, *Shadow Banking and Repo*, 12.
[205] D. Plihon, *What Is So Special About European Shadow Banking?*, 19-20.
[206] D. Plihon, *What Is So Special About European Shadow Banking?*, 20.
[207] The diagram is drawn from: D. Plihon, *What Is So Special About European Shadow Banking?*, 20.
[208] H. Nabilou, A. Prüm, *Shadow Banking in Europe: Idiosyncrasies and their Implications for Financial Regulation*, 2. For a critical analysis of direct and indirect materialization of systemic risk, *see* A. M. Pacces,

Although the repo market was initially left unregulated, in the wake of the post-crisis regulatory agenda, the Financial Stability Board (FSB) - the international body created by G20 economies that monitors and makes recommendations about the global financial system[209] - released a report in 2011 to address the oversight and regulation of the shadow banking system[210]. This report argued for the need to implement a number of regulatory improvements regarding repos, including:

(i) limiting the excessive use of rehypothecation;

(ii)introducing minimum haircuts in order to mitigate procyclicality[211];

(iii) strengthening relevant market infrastructures for repo transactions[212].

More in detail, the report "*[...] has identified the following three main areas that may need to be considered in addressing the risks in the secured funding market*: *regulating securities lending-related cash collateral reinvestment programs: (i) regulatory measures could be introduced to place limits on the maturity of investments into which cash collateral is invested or on the types of instruments that are used for these investments [...]; (ii) macro-prudential measures related to repos and securities lending: introduction of macroprudential requirements such as minimum margin or haircuts to mitigate procyclicality should be considered further in addressing systemic risks [...]; (iii) improving market infrastructure for secured funding markets: strengthening market infrastructure for secured funding markets such as repo clearing, settlement and trade reporting arrangements should be considered*"[213]. Subsequently, in 2013 the FSB refined

H. Nabilou, *The Law and Economics of Shadow Banking*, 17 ff. If we were to compare the characteristic features of traditional and shadow banking, we would find that traditional banking has a simple structure, obtains funds mainly through deposits, is mainly exposed to credit risk and is composed of intermediaries like low-ROE banks. On the contrary, shadow banking has a complex structure, funds itself through wholesale instruments, has a short-term exposure, is mainly subject to market risk and its typical intermediary would be a high-ROE non-bank. However, the market framework is not straightforward, *see* R. Comotto, *Shadow Banking and Repo*, 8.

[209] *See* http://www.fsb.org/about/.

[210] *See* Financial Stability Board, *Shadow Banking: Strengthening Oversight and Regulation. Recommendation of the Financial Stability Board,* 2011, available at http://www.fsb.org/wp-content/uploads/r_111027a.pdf.

[211] Procyclicality refers to the propensity to amplify cycles of financial activity. For an overview of repo and procyclicality *see* R. Comotto, *Frequently Asked Questions on Repo*, 27-28.

[212] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 39-40. *See* Financial Stability Board, *Shadow Banking: Strengthening Oversight and Regulation. Recommendation of the Financial Stability Board*. *See also* R. Comotto, *Shadow Banking and Repo*, 9-10 for an overview of the risks posed by shadow banking, especially with regard to repo markets. In sum, the range of issues covered are: (i) the scale of the shadow banking system; (ii) regulatory gaps; (iii) regulatory arbitrage; (iv) agency problems; (v) interconnectedness; (vi) complexity; (vii) lack of transparency; (viii) mispricing of risk; (ix) over-leverage; (x) amplification of pro-cyclicality.

[213] Financial Stability Board, *Shadow Banking: Strengthening Oversight and Regulation. Recommendation of the Financial Stability Board*, 23.

its policy proposals[214] by underlying the main areas of policy interventions, including market transparency, prudential regulation of securities financing and system-wide supervision of the repo market[215]. In addition, the FSB has urged regulators across different jurisdictions to collect more accurate data on securities financing transactions in order to reduce the opacity of the market[216].

The following paragraphs will provide an overview of what has been done thus far to implement this regulatory agenda, shedding some light upon the regulatory reforms that still need to be implemented in the United States and in Europe. Furthermore, the remainder of this chapter will illustrate the main challenges for the achievement of a global, comprehensive framework for the shadow banking system and repurchase agreements.

3.5. *EU regulations on repos*

In Europe, the regulatory framework disciplining repurchase agreements reflects the continental legal traditions and the specific characteristics of European financial markets. Europe features a solid bank-based financial system, which is dominated by a universal banking model - in which banks provide a vast array of financial services, including commercial and investment activities[217]. The European model implies there is a strong case for a greater interconnectedness between shadow banks and banks as the latter engage in a variety of financial activities on behalf of one single entity. Therefore, banks are likely to perform a large portion of their financial operations through, *inter alia,*

[214] Financial Stability Board, *Strengthening Oversight and Regulation of Shadow Banking. Policy Framework for Addressing Shadow Banking Risks in Securities Lending and Repos,* 2013, available at http://www.fsb.org/2013/08/r_130829b/.
[215] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 40.
[216] J. Cullen, *The Repo Market, Collateral and Systemic Risk: in Search of Regulatory Coherence,* 99.
[217] H. Nabilou, A. Prüm, *Shadow Banking in Europe: Idiosyncrasies and their Implications for Financial Regulation*, 5. In the interests of providing fuller information, we have to acknowledge that even though this is the general European trend, each country has its nuances. For instance, while Germany perfectly fits the universal banking model description, in the UK the proportion of investment banking operations compared to traditional retail activities is greater than in continental Europe. Also, British banks, but French and Spanish credit institutions as well, developed their activities at international level much like American banks, thanks to their colonial history. Furthermore, the French banking system was historically built on the distinction between business banks and deposit banks, like the US banking system, but turned to the universal model in 1984. The Italian banking system was privatized in 1990, pushing for the adoption of the universal model. For an overview of these different models and their evolution, *see* E. Jeffers, D. Plihon, *What Is So Special About European Shadow Banking?*, 5 ff.

sponsoring money market mutual funds (MMMFs) or undertaking broker-dealer functions in the financial system[218]. This interconnectedness - which caused widespread financial stability in the global financial crisis - pushed European regulators to introduce a number of requirements designed to enhance resilience in the banking system, in the attempt to reduce systemic risk and improve the transparency of financial markets[219].

More in detail, European regulators designed a complex plethora of different regulatory tools, enforced either via direct entity-based regulations or through indirect instrument-based requirements[220]. On the one hand, the direct entity-based approach primarily focuses on defining new entities which are involved in certain financial activities. On the other hand, the indirect instrument-based approach aims at regulating shadow banks and wholesale funding through their connections with the banks and at restraining devious shadow baking activities by restricting its instruments[221].

The most important regulatory package impacting the European repo market is the Basel III regime. Basel III is part of the prudential regulatory framework set by the Basel Committee on Banking Supervision (BCBS) - the global standard setter for the prudential regulation of banks and the most prominent forum for international cooperation on banking supervisory matters[222]. The BCBS comprises central banks and bank supervisors representing 28 jurisdictions[223] and it is based at the Bank for International Settlements (BIS) - "the bank for central banks", whose mission is to foster international cooperation in the areas of monetary and financial stability[224]. The Basel III package was implemented in response to the last global financial crisis in order to formulate international standards for an adequate capital base of banks and risk management, targeting both capital requirements and liquidity issues[225]. Specifically, *"[...] the objective of the reforms is to*

[218] H. Nabilou, A. Prüm, *Shadow Banking in Europe: Idiosyncrasies and their Implications for Financial Regulation*, 6.
[219] C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 141.
[220] A. M. Pacces, H. Nabilou, *The Law and Economics of Shadow Banking*, 29.
[221] A. M. Pacces, H. Nabilou, *The Law and Economics of Shadow Banking*, 29.
[222] *See* https://www.bis.org/bcbs/.
[223] *See* https://www.bis.org/bcbs/.
[224] *See* https://www.bis.org/about/index.htm?m=1%7C1.
[225] M. Herdegen, *Principles of International Economic Law,* Oxford, Oxford University Press, 2013, 480. The first Basel Accord was reached in 1998, Basel II in 2004 and Basel III in 2011/2012, *see also* S. Hohl, M. C. Sison, T. Stastny, R. Zamil, *The Basel Framework in 100 jurisdictions: implementation status and proportionality practices,* Bank for International Settlements Financial Stability Institute Insights on Policy Implementation No. 11, 2018; J. Armour, D. Awrey, P. Davies, L. Enriques, J. N. Gordon, C. Mayer, J. Paine, *Principles of Financial Regulation,* 295 ff.; *see* S. Valdez, P. Molyneux, *An Introduction to Global Financial Markets,* London, 32 ff.; H. Scott, *Interconnectedness and Contagion. Financial Panics and the Crisis of 2008*, 121 ff.; J. Dalhuisen, *Dalhuisen on Transnational Comparative Commercial, Financial and Trade Law Volume 3*, Oxford, Hart Publishing, 2016, 787 ff. For an overview of Basel III weaknesses and potential future developments, *see* L. Amorello, *Beyond the Horizon of Banking Regulation: What to Expect from Basel IV,* 58 Harvard International Law Journal (Online), 2016, 21 ff.

improve the banking sector's ability to absorb shocks arising from financial and economic stress, whatever the source, thus reducing the risk of spillover from the financial sector to the real economy [...]"[226]. In sum, the Basel III package aim at addressing a number of shortcomings in the pre-crisis regulatory agenda to foster a resilient global banking system[227].

Against this backdrop, in 2014, the EU, under the supervision of the European Banking Authority - the regulatory authority in charge of the European banking industry supervision - implemented the Basel III package through a package of legislative reforms including the so-called Capital Requirements Directive IV ("CRD IV")[228] and the Capital Requirements Regulation (EU) No. 575/2013 ("CRR")[229] - together, the "CRD package". The CRD package largely implemented the Basel III package, although some adjustments were made in order to make it more suitable for the specifics of the European financial sector[230]. Basel III has four main components, namely:

(i) the reform of risk-based capital requirements;

(ii) the introduction of leverage ratio (LR);

(iii) the introduction of a liquidity coverage ratio (LCR);

(iv) the design of a net stable funding ratio (NSFR).

These components are deemed to impact the repo market in a variety of ways, leading to an increase in the cost of capital and liquidity required for trades in repos[231].

The risk-based capital requirements require banks to hold a minimum buffer of common equity relative to the value of their risk weighted exposures - *i.e.* assets and off-balance sheet exposures weighted according to risk[232]. The calculation for these exposures will determine the amount of capital that a bank has to retain to meet the minimum capital requirements[233]. With regard to repo, this calculation apply to both asset exposure - the underlying securities in a repo transaction - and to counterparty

[226] Basel Committee on Banking Supervision, *Basel III: A Global Regulatory Framework for More Resilient Banks and Banking Systems*, 2010, 1, available at https://www.bis.org/publ/bcbs189.htm.
[227] Basel Committee on Banking Supervision, *Basel III: A Global Regulatory Framework for More Resilient Banks and Banking Systems*, 1.
[228] Directive 2013/36/EU of the European Parliament and of the Council of 26 June 2013 on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms.
[229] Regulation (EU) No 575/2013 of the European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms.
[230] C. Brummer, *Soft Law and the Global Financial System. Rulemaking in the 21st Century,* New York, Cambridge University Press, 2015, 282 ff.
[231] International Capital Market Association (ICMA), *Perspectives from the Eye of the Storm. The Current State and Future Evolution of the European Repo Market,* 2015, 10, available at https://www.icmagroup.org/resources/icma-publications-and-services/icma-reports/.
[232] International Capital Market Association (ICMA), *Perspectives from the Eye of the Storm. The Current State and Future Evolution of the European Repo Market*, 18.
[233] *See* http://www.bankpedia.org/index.php/en/home-page-en/82-uncategorized-terms/23632-risk-weighted-assets-rwa.

exposure[234]. In sum, capital requirements make holding lower quality assets more capital intensive, hence expensive[235]. As a result, capital requirements will increase the cost of capital applied to repo transactions, especially discouraging repo activity in lower quality assets and with lower rated counterparties[236].

The leverage ratio is a non-risk-based indicator measuring the ratio of a bank's capital to its total assets, set at a minimum level of 3% starting from 2018. Hence, the greater the bank's total assets the more capital it will need to hold[237]. The leverage ratio aims at avoiding an unrestrained increase of leverage in the financial system[238]. For its calculation, bank's *Tier 1 capital*[239] - the core capital that includes equity and disclosed reserves - is divided by the value of all on- and off- balance sheet's exposures, including the values of assets, derivatives, adds-on for counterparty credit risk of securities financing transactions (including repos and reverse repos) and other off-balance sheet items[240]. Since repos are generally considered low risk financial instruments, implementing a non-risk-weighted leverage ratio means that repurchase agreements will bear the same regulatory costs of unsecured instruments, eventually making repos more expensive for banks[241].

The remaining two components, the liquidity coverage ratio and the net stable funding ratio, are liquidity requirements set to avoid disruptive liquidity flights, as exogenous shocks to a bank - *i.e.* events coming from the outside of the financial systems - can cause contagion in those portions of the financial system where there is an overreliance on short-term funding[242]. However, it has been argued that liquidity crisis are endogenous[243] (often the result of too much leverage). Against this backdrop, the LCR and NSFR rather provide constraints on the growth of shadow banking[244].

[234] International Capital Market Association (ICMA), *Perspectives from the Eye of the Storm. The Current State and Future Evolution of the European Repo Market*, 18.
[235] International Capital Market Association (ICMA), *Perspectives from the Eye of the Storm. The Current State and Future Evolution of the European Repo Market*, 19.
[236] International Capital Market Association (ICMA), *Perspectives from the Eye of the Storm. The Current State and Future Evolution of the European Repo Market*, 19.
[237] C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 145.
[238] C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 145. For a thorough analysis of the impact of the leverage ratio in the repo market, *see* Bank for International Settlements (BIS), *Repo Market Functioning,* CGFS Papers No. 59, 2017, 58, available at https://www.bis.org/cgfs/.
[239] Tier 1 is essentially the "best" capital and is composed of shareholder's equity, retained profits and noncumulative perpetual preference shares.
[240] C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 145.
[241] S. Wu, H. Nabilou, *Repo Markets across the Atlantic: Similar but Unalike*, 35.
[242] A. M. Pacces, H. Nabilou, *The Law and Economics of Shadow Banking*, 34.
[243] A. M. Pacces, H. Nabilou, *The Law and Economics of Shadow Banking*, 34.
[244] A. M. Pacces, H. Nabilou, *The Law and Economics of Shadow Banking*, 34.

The liquidity coverage ratio was translated by the CRR into a liquidity coverage requirement, applicable to banks but not investment firms[245]. The LCR requires banks to hold sufficient high-quality liquid assets ("HQLAs") on their balance sheets to cover their projected net cash flows for a 30-day stressed period. In other words, the amount of HQLAs must be equal to at least 100% of the difference between expected cash outflows and capped cash inflows over a period of 30 days[246]. HQLAs should have low credit and market risk, they should remain liquid in times of financial stress and central-bank eligible[247]. The following formula better explains the calculation of the LCR[248].

$$\frac{\text{Stock of HQLA}}{\text{Total net cash outflows over the next 30 calendar days}} \geq 100\%$$

Expected cash outflows include funding on the bank's balance sheet expected to be repaid *by* the bank within 30 days (such as wholesale funding and cash received under maturing repos), while expected cash inflows include funding expected to be repaid *to* the bank within 30 days, such as cash paid under maturing reverse repos[249]. HQLAs are to be easily and immediately converted into cash when sold in the private market with little or no loss of value, even in stressed conditions, in order to meet liquidity needs for a 30-calendar day stress scenario[250]. To this end, banks will need to hold more HQLAs at the end of each reporting period, so that they will be disincentivized to rely on short-term repo funding and will not be able to use lower quality collateral[251]. On the one hand, the LCR increases the appeal of higher-grade liquid collateral to increase the HQLA

[245] C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 146.
[246] International Capital Market Association (ICMA), *Perspectives from the Eye of the Storm. The Current State and Future Evolution of the European Repo Market*, 16.
[247] International Capital Market Association (ICMA), *A Guide to Best Practice in the European Repo Market,* 104.
[248] The formula is drawn from: Bank for International Settlements (BIS), *Liquidity Coverage Ratio (LCR) - Executive Summary,* 2018, 1, available at https://www.bis.org/fsi/fsisummaries/lcr.pdf.
[249] C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 147.
[250] J. Cullen, *The Repo Market, Collateral and Systemic Risk: in Search of Regulatory Coherence*, 105. Specifically, HQLAs are organized into 3 tiers according to their perceived liquidity and quality, *see also* C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 146.
[251] S. Wu, H. Nabilou, *Repo Markets across the Atlantic: Similar but Unalike*, 36. *Also see* International Capital Market Association (ICMA), *Perspectives from the Eye of the Storm. The Current State and Future Evolution of the European Repo Market*, 16-17 for a thorough analysis of HQLAs. With respect to the interbank market, national authorities might qualify differently HQLAs. For instance, an American bank in London may not be able to count Italian bonds as part of its HQLA, whereas a French or Italian bank, of course, may do so. Therefore, collateral upgrades between banks are possible.

numerator. On the other hand, the same collateral may suffer shortages as it must be kept on the bank's balance sheet to meet the LCR minimum requirements[252].

Finally, the net stable funding ratio was incorporated by the CRR as a net stable funding requirement planned to be implemented in 2018. The NSFR requires banks to hold a certain amount of liabilities having a stable funding profile in terms of composition and maturity, thereby encouraging longer-term funding and limiting excessive recourse to wholesale short-term transactions, such as repos[253]. Specifically, the NSFR requires the amount of available stable funding ("ASF") to be at least equal to 100% of the required stable funding ("RSF")[254]. The following formula better explains the calculation of the NSFR[255].

$$\frac{\textbf{Total Available Stable Funding (ASF)}}{\textbf{Total Required Stable Funding (RSF)}} \geq 100\%$$

The ASF is the amount of capital and liabilities expected to be reliable over one year, while the amount of RSF is a function which depends upon liquidity characteristics, residual maturities of assets, counterparty type and off-balance sheet exposures[256]. While the LCR aims at managing liquidity on a monthly basis, the NSFR measures stable liquidity on a yearly basis. From a repo perspective, on the one hand, there will be a substantial increase in the costs of short-term funding[257]. On the other hand, banks will be incentivized to allocate long term funding against reverse repo financing with other financial institutions (but without offsetting the trades with matching repos)[258]. Of all four components of the Basel III package, the NSFR caused the most concerns among repo

[252] J. Cullen, *The Repo Market, Collateral and Systemic Risk: in Search of Regulatory Coherence,* 106.
[253] Bank for International Settlements (BIS), *Repo Market Functioning*, 61. An example, drawn from C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 147, shall be useful. If a bank lends cash long-term and funds itself with short-term assets, there is likely a funding risk, creating a maturity mismatch and increasing the associated leverage. The NSFR sets out the methodology in order to assess this kind of risk.
[254] C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 147.
[255] The formula is drawn from: Bank for International Settlements (BIS), *Net Stable Funding Ratio - Executive Summary,* 2018, 1, available at https://www.bis.org/fsi/fsisummaries/nsfr.pdf.
[256] Bank for International Settlements (BIS), *Repo Market Functioning*, 61.
[257] International Capital Market Association (ICMA), *Perspectives from the Eye of the Storm. The Current State and Future Evolution of the European Repo Market*, 19.
[258] International Capital Market Association (ICMA), *Perspectives from the Eye of the Storm. The Current State and Future Evolution of the European Repo Market*, 19; *See also* International Capital Market Association (ICMA), *Impacts of the Net Stable Funding Ratio on Repo and Collateral Markets,* 2016, available at https://www.icmagroup.org/resources/icma-publications-and-services/icma-reports/.

market participants[259]. According to ICMA's report[260], a respondent said that "*once NSFR comes in, then it's game over. We can all go home"*, while others stated that *"NSFR will be a problem. We are hoping that it will be absorbed at the bank level, not the desk level, so that we can stay in business*". This is because there is uncertainty in the way the NSFR will be actually implemented and how it will interplay with other Basel III components, especially the leverage ratio[261].

The second piece of legislation impacting repos in Europe is the Regulation (EU) 2015/2365 on Transparency of Securities Financing Transactions and of Reuse (SFTR)[262], which came into force in 2016, although various obligations were planned to come into force in 2017 and 2018[263]. The SFTR is an instrument-based regulation, introduced to address concerns regarding the risks of shadow banking in the European Union, seeking to ensure transparency of the securities financing markets and to ensure controls on the reuse of the underlying collateral in securities financing transactions (SFTs)[264]. This regulation applies to any financial or non-financial counterparty to SFTs, including - besides (reverse) repurchase agreements - sell-buy backs, securities lending, commodities lending and margin lending transactions, although certain provisions apply to collateral arrangements and total return swaps[265]. The SFTR requires entities engaging in repos and securities lending to report their transactions to trade repositories[266] and provides limits on rehypothecation[267]. Specifically, with regard to repos, the bulk of SFTR has three sets of requirements:

(i) *transaction reporting:* in order to ensure transparency, a repo trade is to be reported to a registered trade repository by no later than the working day following the date on which the transaction was entered into (unless the trade is concluded with a central bank);

[259] International Capital Market Association (ICMA), *Perspectives from the Eye of the Storm. The Current State and Future Evolution of the European Repo Market*, 19.
[260] International Capital Market Association (ICMA), *Perspectives from the Eye of the Storm. The Current State and Future Evolution of the European Repo Market,* 19-20.
[261] International Capital Market Association (ICMA), *Perspectives from the Eye of the Storm. The Current State and Future Evolution of the European Repo Market,* 20.
[262] Regulation (EU) 2015/2365 of the European Parliament and of the Council of 25 November 2015 on transparency of securities financing transactions and of reuse and amending Regulation (EU) No 648/2012.
[263] C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 142.
[264] C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 141.
[265] C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 141.
[266] Trade repositories (TRs) are post-trading infrastructures that collect, store, process all available data on transactions concluded on trading venues or over-the-counter. For a comparative overview of the regulation of TRs, *see* G. Ferrarini, P. Saguato, *Regulating Financial Market Infrastructures*, 25 ff. For a thorough analysis of the role of TRs in the repo market, *see* P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 39 ff. The reporting requirements for SFTs are similar to those already applicable to derivative transactions under EMIR II, *see* J. Cullen, *The Repo Market, Collateral and Systemic Risk: in Search of Regulatory Coherence*, 99.
[267] A. M. Pacces, H. Nabilou, *The Law and Economics of Shadow Banking*, 38.

this way regulators may be aware of the volume, scale and maturity of each outstanding transaction and evaluate risks and interconnectedness of the system;

(ii) *disclosure of use of SFTs:* certain categories of investment funds[268] shall disclose to their investors their use of repurchase agreement as a funding tool;

(iii) *reuse of collateral:* in order to limit destabilizing collateral chains - *i.e*. engaging in rehypothecation several times during the life of a transaction, giving rise to a number of competing claims against the same assets - the collateral may be rehypothecated without explicit cap on reuse[269], but only with knowledge and written consent of the collateral provider, which needs to be informed of the related risks, including the fact she may not receive the asset back in the event of transferee's default or insolvency[270].

Overall, the SFTR is beneficial to the repo market as it allows to provide more information and data needed to monitor systemic risk. Also, it cannot be easily circumvented as it applies at a transactional level[271]. The SFTR's reception did not cause concerns among market operators in terms of market impact, but many practitioners raised doubts upon the excessive and costly detailed reporting requirements, wondering what systemic risk the regulation is meant to target given the lack of any specific risk indicators[272].

The third set of rules we are going to address is designed to enforce the entity-based approach taken by the EU to respond to shadow banking. To this end, the EU adopted Regulation (EU) 2017/1131 on money market funds.[273] This regulation consists of a variety of new requirements targeting MMMFs, large users of repurchase agreements[274],

[268] Namely, funds subject to the Undertakings for the Collective Investment in Transferable Securities (UCITS) - the EU harmonized regulatory framework for management and sale of mutual funds - and those subject to the Alternative Fund Managers Directive (AIFMD) - *i.e.* hedge funds, private equity funds and real estate funds, *see* C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 142 and https://www.investopedia.com/terms/a/alternative-investment-fund-managers-directive-aifmd.asp.

[269] Certain EU member states, like France, have introduced limitations on the reuse, similarly to what happens in the USA where there is a 140% cap, *see* S. Wu, H. Nabilou, *Repo Markets across the Atlantic: Similar but Unalike,* 16.

[270] C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 142. With regard to the reuse of collateral, if this transparency requirement is breached, the title transfer collateral arrangement is still valid, and the transferor is protected. To this end, ICMA has published an information statement for parties to be compliant with the SFTR's rules on reuse of collateral. Collateral arrangements are governed by the Financial Collateral Directive (FCD), which we have discussed in Chapter II at paragraph 2.1., among the goals of which there is the harmonization of the title transfer regime for repo transactions and the strengthening of the relationship between collateral takers, collateral providers and creditors, *see* S. Wu, H. Nabilou, *Repo Markets across the Atlantic: Similar but Unalike*, 15.

[271] A. M. Pacces, H. Nabilou, *The Law and Economics of Shadow Banking*, 38.

[272] International Capital Market Association (ICMA), *Perspectives from the Eye of the Storm. The Current State and Future Evolution of the European Repo Market*, 38.

[273] Regulation (EU) 2017/1131 of the European Parliament and of the Council of 14 June 2017 on money market funds. MMMFs are governed either by the UCITS or by the AIFMD regime, *see* H. Nabilou, A. Prüm, *Shadow Banking in Europe: Idiosyncrasies and their Implications for Financial Regulation*, 37 ff.

[274] Article 14 and 15 of Regulation (EU) 2017/1131 defines the eligible repurchase agreements and reverse repurchase agreements that MMMFs may enter into. Furthermore, the premises of the Regulation also state

and namely their interconnectedness with banks through so called "constant net asset value" ("CNAV") funds[275]. CNAV MMMFs are substitute for insured deposits, relying on bank's sponsorship to obtain discretionary capital[276]. The liquidity support provided by the sponsoring bank might expose the latter to liquidity risks, exacerbating the risk of failure arising out from the same interconnectedness of the bank and the MMMF[277]. To this end, the Regulation imposes liquidity restrictions to CNAV funds by requiring these entities to invest exclusively in public debt or low volatility assets to avoid runs on funds[278]. Accordingly, after a transition period of two years, all CNAV funds can either direct all their investments in public debt instruments or they will need to convert into low volatility net asset value funds (LVNAVs)[279].

A fourth piece of legislation impacting the repo market is the Bank Recovery and Resolution Directive - BRRD (Directive 2014/59/EU)[280] which was introduced - similarly to the SFTR - as a regulatory response to the financial crisis[281]. The BRRD applies to EU banks and investment firms, empowering resolution authorities to orderly

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that *[...]Reverse repurchase agreements should be able to be used by MMFs as a means to invest excess cash on a very short-term basis, provided that the position is fully collateralized. In order to protect investors, it is necessary to ensure that the collateral provided in the framework of reverse repurchase agreements is of high quality and does not display a high correlation with the performance of the counterparty, in order to avoid a negative impact in the event of default of the counterparty. In addition, an MMF should be allowed to invest in repurchase agreements up to a limit of 10 % of its assets. Other efficient portfolio management techniques, including securities lending and borrowing, should not be used by an MMF as they are likely to impinge on achieving the investment objectives of the MMF. In order to limit risk-taking by MMFs, it is essential to reduce counterparty risk by subjecting the portfolio of MMFs to clear diversification requirements. To that end, reverse repurchase agreements should be fully collateralized and, in order to limit the operational risk, a single reverse repurchase agreement counterparty should not account for more than 15 % of an MMF's assets. [...].*

[275] H. Nabilou, A. Prüm, *Shadow Banking in Europe: Idiosyncrasies and their Implications for Financial Regulation*, 7. In addition, *[...] harmonized rules should apply to collective investment undertakings whose characteristics correspond to those associated with an MMF. For UCITS and AIFs that have the objective of offering returns in line with money market rates, or of preserving the value of the investment, and that seek to achieve those objectives by investing in short-term assets such as money market instruments or deposits, or entering into reverse repurchase agreements or certain derivative contracts with the sole purpose of hedging risks inherent to other investments of the fund, compliance with the new rules on MMFs should be mandatory [...].*

[276] H. Nabilou, A. Prüm, *Shadow Banking in Europe: Idiosyncrasies and their Implications for Financial Regulation*, 7.

[277] H. Nabilou, A. Prüm, *Shadow Banking in Europe: Idiosyncrasies and their Implications for Financial Regulation*, 7.

[278] A. M. Pacces, H. Nabilou, *The Law and Economics of Shadow Banking*, 38. Initially, the European Commission proposed a 3% capital buffer on all CNAV funds, but the final draft does not include such provision.

[279] A. M. Pacces, H. Nabilou, *The Law and Economics of Shadow Banking,* 32.

[280] Directive 2014/59/EU of the European Parliament and of the Council of 15 May 2014 establishing a framework for the recovery and resolution of credit institutions and investment firms. For a thorough analysis of bank resolution in comparative perspective, from the origins to the actual functioning, *see* J. Armour, D. Awrey, P. Davies, L. Enriques, J. N. Gordon, C. Mayer, J. Paine, *Principles of Financial Regulation*, 340 ff.; R. Lastra, *International Financial and Monetary Law*, 165 ff.

[281] C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 142.

manage the strategic recovery and resolution of troubled banks[282]. Namely, resolution objectives aim at achieving the continuity of the bank's critical functions, avoiding destabilization of the financial system and protecting public funds, deposits and client assets[283]. Resolution authorities are now empowered with resolution tools including the sale of business, transfer of shares of the failing bank to a "bridge institution", asset separation or bail in - *i.e.* cancellation of debts owed to creditors and depositors of the failing institutions[284]. The directive impacts the repo market in many ways as:

(i) it imposes temporary restrictions on the contractual rights to terminate certain financial contracts in the event of default;

(ii) resolution authorities may terminate repos with no need of an event of default;

(iii) repo trades may be transferred to a new counterparty (*e.g.* a "good bank");

(iv) resolution authorities may bail-in unsecured liability owed by the failing bank, in order to write it down or convert it into equity[285].

More in detail, resolution authorities can close-out financial contracts, including repos, and calculate residual net amounts for bail-in purposes, amend repurchase agreements and temporarily suspend payments and delivery obligations[286]. The latter power also implicate a suspension of creditors' rights to enforce security against the failing bank and counterparty's contractual termination rights, *i.e.* the so-called contractual stay (*see supra para. 2.2.*)[287]. However, under the GMRA, a party to a repo trade is not allowed to exploit any resolution actions from the resolution authority as a legal basis to terminate the master agreement in the event of a default[288]. Repo market participants positively welcomed the BRRD, although some concern was expressed regarding the payment suspension and delivery obligations, as in such case they would be exposed to market risk, without being confident on whether to hedge or trade out their underlying exposure[289].

By way of conclusion, we have to acknowledge that the regulatory framework adopted by the European Union is very ambitious. Repo market participants have generally responded positively to new regulations, as highlighted by the ongoing market

[282] L. Amorello, *Bail-In or Bail-Out? A Survey on the ECB's Role of "Bank-Loss-Absorber of Last Resort"*, 398.
[283] C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 143.
[284] C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 143-144.
[285] C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 143.
[286] C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 144.
[287] C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 144.
[288] C. Georgiou, J. Haines, *Understanding Repo and the GMRA*, 144.
[289] International Capital Market Association (ICMA), *Perspectives from the Eye of the Storm. The Current State and Future Evolution of the European Repo Market*, 38.

growth. However, there are also concerned about the cumulative regulatory onus[290]. The widespread perception is that regulators do not have a practical understanding of the securities financing market and may eventually make the repo market less viable[291]. Against this backdrop, European regulations might serve the opposite purpose of what they are supposed to achieve, creating a sense of uncertainty and negatively affecting potential business planning[292]. In fact, there is general agreement regarding the impact that these regulations may have in the future for the repo market, namely:

(i) repo volumes will eventually decrease as a result of these stricter rules, similarly to what is already happening in the US;

(ii) there will be more buy-side participants, particularly cash-rich corporate treasuries;

(iii) the market will become more sophisticated, *i.e*. a more heterogeneous and bespoke financial environment where technology plays a greater role;

(iv) the SFTR is making repos expensive, adding costs and risk in every transaction;

(v) liquidity and collateral management functions will continue to merge, becoming eventually one and the same;

(vi) the withdrawal of the ECB's quantitative easing programs will eventually reveal potential cracks in the market, presumably causing an increase in costs and volatility, as repo markets will not be able to count on central bank's liquidity support and will need to function by themselves[293].

Essentially, the European market is bound to reinvent itself or, to quote a market participant, *"the repo market isn't going away. It might look very different, but it will still be around"*[294].

[290] International Capital Market Association (ICMA), *Perspectives from the Eye of the Storm. The Current State and Future Evolution of the European Repo Market*, 39.
[291] International Capital Market Association (ICMA), *Perspectives from the Eye of the Storm. The Current State and Future Evolution of the European Repo Market*, 39.
[292] International Capital Market Association (ICMA), *Perspectives from the Eye of the Storm. The Current State and Future Evolution of the European Repo Market*, 39. According to the ICMA's report, *[...] in response to the question "what will the market look like three years from now", one interviewee broke into laughter, remarking that not even the regulators knew that.*
[293] International Capital Market Association (ICMA), *Perspectives from the Eye of the Storm. The Current State and Future Evolution of the European Repo Market*, 41.
[294] International Capital Market Association (ICMA), *Perspectives from the Eye of the Storm. The Current State and Future Evolution of the European Repo Market*, 42.

3.6. *US regulations on repos*

Unlike the European scenario, the United States has a market-based financial system - in which funding primarily rely on capital markets[295]. Accordingly, the US shadow banking system and the consequential regulatory approach are somewhat different when compared to the European financial system. As of today, the US regulatory agenda targeting repurchase agreements is less consistent than the current EU regulatory framework. In the years preceding the last financial turmoil, the US repo market flourished at the intersection between banking and securities regulation, with no systematic oversight of its participants[296]. Supervision and regulation were shared by the Securities and Exchange Commission ("SEC") - the independent federal agency responsible for protecting investors and maintaining fair and orderly functioning of securities markets - and the Federal Reserve, but no relevant reforms were undertaken to address potential vulnerabilities of wholesale funding[297]. At the same time, US regulators and policymakers have acknowledged wholesale funding as a source of systemic risk, in view of the repercussions that overreliance on short-term cash played in the failure of Lehman Brothers[298]. In the aftermath of the financial crisis, the repo market, along with large portions of the shadow banking sectors, was almost entirely left untouched by regulators, who focused instead on other segments of the financial system, namely derivatives and too-big-too-fail issues[299]. Against this backdrop, the Financial Stability

[295] H. Nabilou, A. Prüm, *Shadow Banking in Europe: Idiosyncrasies and their Implications for Financial* Regulation, 5.
[296] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 9.
[297] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 9.
[298] V. Baklanova, A. Copeland, R. McCaugrin, *Reference Guide to U.S. Repo and Securities Lending Markets*, 33.
[299] P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 9. Saguato points out that the Dodd-Frank Act in its 848 pages expressly mentions repurchase agreements only 37 times, 25 of which are in the "definitions" section. In the words of the former Fed Board of Governors' Member Daniel K. Tarullo, *[...]" To date, over-the-counter derivatives reform is the primary example of a post-crisis effort at market-wide regulation. Given that the 2007-2008 financial crisis was driven more by disruptions in the SFT markets than by disruptions in the over-the-counter derivative markets, comparable attention to the SFT markets is surely needed", see* D. K. Tarullo*., Shadow Banking and Systemic Risk Regulation,* Speech at the "Americans for Financial Reform and Economic Policy Institute Conference", Washington D.C., 2013, 14, available at https://www.bis.org/review/r131125j.pdf. In his speech, he proposed two policy options to address the vulnerabilities of financial firms with large amounts of short-term wholesale funding exposures. Namely, "*the first would impose a regulatory charge calculated by reference to reliance on SFTs and other forms of short-term wholesale funding, whether the firm uses that funding to finance inventory or an SFT matched book. The second would directly increase the very low charges under current and pending regulatory standards attracted by SFT matched book".*

Oversight Council ("FSOC") - the federal government organization in charge of monitoring and identifying excessive risks to the US financial stability - recommended US policymakers to take certain actions to address risks in the repo market, *i.e.* improving the structure of triparty markets and limiting the potential systemic spillovers from repo-related asset fire sales[300].

A unitary legislative proposal took the form of the 2010 Dodd-Frank Wall Street Reform and Consumer Protection Act (the "Dodd-Frank Act"), which is nowadays one of the cornerstones of the US regulatory framework targeting systemic risks in times of financial distress and strengthening oversight over the vulnerabilities arising from the system's interconnectedness[301]. The Dodd-Frank Act primarily provides stricter prudential requirements for so-called "systemically important institutions" - *i.e.* financial institutions whose failure might trigger a financial crisis - enhancing, among others, risk-based capital requirements, leverage limits, liquidity requirements, resolution plans, credit exposure reporting requirements, concentration limits, contingent capital requirements, public disclosures, short-term debt limits and overall risk management rules[302]. With respect to repos, sections 165 and 166, which are deemed to enhance the prudential standards of US bank holding companies - *i.e.* companies that controls one or more banks - require dealer subsidiaries of bank holding companies to extend the term of their liabilities by shifting toward longer-term debt financing. As a result, these rules decrease repo exposures[303]. Moreover, in 2011 the Federal Deposit Insurance Corporation ("FDIC") - the government corporation in charge of providing deposit insurance to depositors in US commercial and savings banks and to resolve failed banks - expanded the deposit insurance assessment base from deposits to all bank's liabilities[304]. Specifically, the assessment base to calculate the amount to be paid by each bank now

[300] V. Baklanova, A. Copeland, R. McCaugrin, *Reference Guide to U.S. Repo and Securities Lending Markets*, 33.
[301] V. Acharya, T. Cooley, M. Richardson, R. Sylla, I. Walter, *A Bird's-Eye View. The Dodd-Frank Wall Street Reform and Consumer Protection Act,* in V. Acharya, T. Cooley, M. Richardson, I. Walter (eds.), *Regulating Wall Street. The Dodd-Franck Act and the New Architecture of Global Finance*, Hoboken, Wiley, 2011, 5. The Dodd-Frank Act's core provisions can be summarized as follows: (i) identifying and regulating systemic risk, by creating a Systemic Risk Council; (ii) proposing an end to too-big-to-fail; (iii) expanding the responsibility and authority of the Federal Reserve; (iv) restricting discretionary regulatory interventions; (v) limiting bank holding companies' proprietary trading activities; (vi) regulating and enhancing transparency of derivatives.
[302] V. Acharya, N. Kulkarni, M. Richardson, *Capital, Contingent Capital and Liquidity Requirements,* in V. Acharya, T. Cooley, M. Richardson, I. Walter (eds.), *Regulating Wall Street. The Dodd-Franck Act and the New Architecture of Global Finance*, Hoboken, Wiley, 2011, 150.
[303] V. Baklanova, A. Copeland, R. McCaugrin, *Reference Guide to U.S. Repo and Securities Lending Markets*, 34.
[304] V. Baklanova, A. Copeland, R. McCaugrin, *Reference Guide to U.S. Repo and Securities Lending Markets*, 34.

includes repurchase agreements, thus making it more expensive for FDIC-insured firms to fund their assets in the repo market[305].

The Basel III framework, the main features of which have been already discussed above, is also material in the US. In particular, the Federal Reserve[306], the FDIC and the Office of the Comptroller of the Currency ("OCC") - the independent bureau in charge of charter, supervision and regulation of banks - jointly oversaw the Basel III implementation in the US framework with regard to its main components, introducing even more stringent liquidity and capital requirements than those implemented in Europe[307]. Here, the leverage ratio is called supplementary leverage ratio ("SLR"), under which banks need to fund at least 6% of their assets with equity, whereas the CRR package in EU only require a 3% equity funding[308]. The US SLR, which is binding on US banks and includes leverage incurred through repo borrowings, has caused a decrease in repo borrowings by broker-dealer affiliates both in the bilateral and in the triparty market, although there has been a consequential increase in the use of price-volatile collateral[309]. New repo transactions are backed by riskier collateral as financial firms subject to the SLR tend to choose riskier investments[310]. The other material Basel III requirements, namely the liquidity coverage ratio and the net stable funding ratio[311], were adopted to make short-term repo funding more expensive, especially if in exchange for low quality collateral, and to encourage US banks to extend the maturity of their liabilities, reducing exposures to wholesale short-term funding sources[312]. Combined together, the Dodd-Frank Act and Basel III successfully reduced market's reliance on repo financing, along with the lengthening of the maturity profile of certain repo transactions along with the diversification of funding sources and the associated risks[313].

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[305] V. Baklanova, A. Copeland, R. McCaugrin, *Reference Guide to U.S. Repo and Securities Lending Markets*, 34.

[306] In 2015 the Fed has identified wholesale funding and specifically repo markets as sources of systemic risk that have to be taken into account when calculating the capital charge required under the Basel Accord for global systemically important banks, *see* J. Armour, D. Awrey, P. Davies, L. Enriques, J. N. Gordon, C. Mayer, J. Paine, *Principles of Financial Regulation*, 459.

[307] C. Brummer*., Soft Law and the Global Financial System. Rulemaking in the 21st Century*, 280. For a thorough overview of Basel III implementation in the US, *see* M. Barr, H. Jackson, M. Tahyar, *Financial Regulation: Law and Policy*, 316 ff.

[308] A. M. Pacces, H. Nabilou, *The Law and Economics of Shadow Banking*, 34.

[309] S. Wu, H. Nabilou, *Repo Markets across the Atlantic: Similar but Unalike*, 35.

[310] A. M. Pacces, H. Nabilou, *The Law and Economics of Shadow Banking,* 35.

[311] We have already discussed the essentials of the LCR and the NSFR in the previous paragraph. For a critical analysis of the US implementation of Basel III, *see* H. Scott, *Interconnectedness and Contagion. Financial Panics and the Crisis of 2008*, 134 ff.

[312] V. Baklanova, A. Copeland, R. McCaugrin, *Reference Guide to U.S. Repo and Securities Lending Markets*, 34-35. *See also* H. Scott, *Interconnectedness and Contagion. Financial Panics and the Crisis of 2008*, 121 ff.; K. Schultz, J. Bockian, *Repurchase Agreements*, 193.

[313] V. Baklanova, A. Copeland, R. McCaugrin, *Reference Guide to U.S. Repo and Securities Lending Markets*, 35-36.

Against this backdrop, in 2014 the Federal Reserve also adopted regulations[314] in order to extend US rules to foreign bank organizations with total consolidated assets of at least $50 billion[315]. In particular, foreign banks are now required to create a US-based Intermediate Holding Company ("IHC"), under which all their US-based subsidiaries are to be incorporated. The IHCs are subject to US prudential standards (including Basel III requirements and Dodd-Frank Act liquidity and risk management provisions) and, eventually, to the same constraints in repo activities[316].

A further aspect of US regulation deals with the reuse of collateral in repo transactions to provide additional liquidity to the market, the already mentioned "rehypothecation"[317], which is regulated through an entity-based approach, targeting major players in collateral intermediation - especially prime brokers and custodian intermediaries[318]. The Federal Reserve Regulation T and SEC Rule 15c3-3, also known as the "Customer Protection Rule"[319], have determined that a prime broker or a custodian may only rehypothecate an amount of collateral which can be at most equivalent to 140% of their clients' liabilities[320]. In addition, as rehypothecation may also pose a threat to financial stability, the Dodd-Frank Act contains provisions regulating risks associated with the reuse of collateral. Specifically, in order to discourage potential clients' runs on prime brokers, the collateral posted by clients shall not be segregated with broker's other funds[321].

US regulators have also adopted a peculiar bankruptcy law regime as a mean to regulate collateral and repos[322]. Besides the abovementioned exemption from the automatic stay granted to qualified financial contracts, such as repos, in case of bankruptcy through certain safe harbors, Title II of the Dodd-Frank Act offers regulators

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[314] *See* https://www.federalreserve.gov/newsevents/speech/tarullo20140327a.htm.
[315] C. Brummer, *Soft Law and the Global Financial System. Rulemaking in the 21st Century*, 281.
[316] C. Brummer, *Soft Law and the Global Financial System. Rulemaking in the 21st Century*, 281.
[317] Rehypothecation occurs when there is a grant of security interest or an encumbrance of the securities by an intermediary which is holding the same securities on behalf of an investor, *see* S. Wu, H. Nabilou, *Repo Markets across the Atlantic: Similar but Unalike,* 17; G. Gorton, A. Metrick, *Regulating the Shadow Banking System,* 2010, 12 ff., available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1676947
[318] A. M. Pacces, H. Nabilou, *The Law and Economics of Shadow Banking,* 38.
[319] *See* M. Barr, H. Jackson, M. Tahyar, *Financial Regulation: Law and Policy*, 1238.
[320] R. Comotto, *Frequently Asked Questions on Repo*, 11.
[321] S. Wu, H. Nabilou, *Repo Markets across the Atlantic: Similar but Unalike*, 13-14. Although not directly related to repurchase agreements, we have to mention that section 724 of the Dodd-Frank states that parties accepting money, securities or property to margin, guarantee, or secure a swap cleared by a clearinghouse should register as Futures Commission Merchants (FCMs) and should treat all money, securities and property of any swaps customer as belonging to the swap customer. In addition, they are required to separately account for the customer's fund. The same section also requires the segregation of assets for uncleared swaps. *See* H. Nabilou, A. Prüm, *Shadow Banking in Europe: Idiosyncrasies and their Implications for Financial Regulation*, 18-19.
[322] H. Nabilou, A. Prüm, *Shadow Banking in Europe: Idiosyncrasies and their Implications for Financial Regulation*, 21. *See also* A. M. Pacces, H. Nabilou, *The Law and Economics of Shadow Banking,* 40.

an alternative to bankruptcy proceedings in the form of the Orderly Liquidation Authority ("OLA")[323]. During the last financial crisis, financial institutions that collapsed caused collateral damages without the government truly being able to control their bankruptcy. Against this backdrop, the OLA was created *"to provide the necessary authority to liquidate failing financial companies that pose a significant risk to the financial stability of the United States in a manner that mitigates such risks and minimizes moral hazard"*[324]. The statutory scheme of the OLA follows the FDIC receivership authority for depository institutions, where after the closing of a bank the FDIC is appointed as receiver and shall maximize the recoveries for the creditors of the failed institution[325]. Before being placed into receivership under OLA, a financial firm is to be considered a potential source of systemic risk in the event of default. After this assessment, the FDIC gets the authority to liquidate the insolvent institutions[326]. However, as repo runs may cause a disorderly resolution of the firm, after the FDIC has taken over the bank the "safe harbor" exemption afforded to repos no longer applies[327]. Moreover, the Dodd-Frank Act emphasizes that counterparties to a "covered financial company" - *i.e.* brokers and dealers registered with the Securities and Exchange Commission - cannot terminate their repurchase agreements after the firm is subject to the FDIC's receivership[328]. The idea of removing the special bankruptcy treatment for repos, or at least reduce it, would be to adopt a regulatory tool that eventually curbs the liquidity of collateral, especially in triparty markets, simultaneously reducing the reliance on lower-quality assets[329]. For this purpose, some authors have advocated the creation of a special resolution authority called "Repo Resolution Authority (RRA)" in order to deal with potential systemic-wide repo runs in times of financial stress[330]. The RRA would basically purchase illiquid assets from

[323] H. Scott, *Interconnectedness and Contagion. Financial Panics and the Crisis of 2008*, 162; *see also* S. R. Pellerin, J. R. Walter, *Orderly Liquidation Authority as an Alternative to Bankruptcy,* 98(1) Federal Reserve Bank of Richmond Economic Quarterly, 2012, 1 ff. For an overview of post-crisis laws and regulations *see also* E. Morrison, M. J. Roe, C. Sontchi, *Rolling Back the Repo Safe Harbors,* 69 The Business Lawyer, 2014, 1041 ff. For the Dodd-Frank's approach to resolution, *see* C. Brummer*, Soft Law and the Global Financial System. Rulemaking in the 21st Century*, 319 ff.
[324] M. Ricks, *Regulating Money Creation After the Crisis,* 76(1) Harvard Business Law Review, 2011, 122.
[325] It is important to note that OLA is a receivership regime, not an insurance program. However, the FDIC's role generally encompasses both roles, combining depository receivership and deposit insurance in order to make an "orderly bank failure" possible. For a critical analysis of the differences between the two functions, *see* M. Ricks, *Regulating Money Creation After the Crisis*, 122-124.
[326] For an overview of the resolution process under OLA, *see* H. Scott, *Interconnectedness and Contagion. Financial Panics and the Crisis of 2008*, 162-170.
[327] S. Wu, H. Nabilou, *Repo Markets across the Atlantic: Similar but Unalike*, 11.
[328] S. Wu, H. Nabilou, *Repo Markets across the Atlantic: Similar but Unalike,* 11. For an overview of what happens under OLA in case of secured money claims, like repos, *see* M. Ricks, *Regulating Money Creation After the Crisis*, 122.
[329] S. Wu, H. Nabilou, *Repo Markets across the Atlantic: Similar but Unalike*, 11.
[330] S. Wu, H. Nabilou, *Repo Markets across the Atlantic: Similar but Unalike*, 11. Specifically, besides advocating for the repeal of bankruptcy safe harbors - except for high quality government bonds - Acharya

lenders at a predefined haircut and eventually sell the collateral in the event of a borrower's default[331].

Overall, the US regulatory framework for repurchase agreements is quite heterogenous and the main traits are as follows:

(i) the Dodd-Frank Act mandates prudential standards and affiliations rules with regard to securities financing transactions;

(ii) capital and liquidity requirements reduce the risks of runs on repos;

(iii) the Dodd-Frank Act empowered the FSOC to designate systemic non-bank entities to be supervised by the Fed, enhancing their capital, liquidity and other requirements which may also reduce their short-term borrowing activity;

(iv) the OLA and living wills - *i.e.* contingency plans for rapid and orderly resolution in the event of material financial distress or failure of the financial institution - are also designed to reduce the risk that a run on short-term wholesale funding could cause contagion in the financial system;

(v) a number of reforms have been adopted to make money market mutual funds less susceptible to runs[332].

Nonetheless, US wholesale funding and repo markets still face more significant risks when compared to the European scenario. This is because market data collection is still much opaquer in the US than in the EU. Global regulators and market participants have called for more transparency in key areas to improve their trading choices, as they struggle to keep track of potential risks[333]. In this regard, the FSB has made recommendations to national authorities, while the Fed, the SEC and the Office of Financial Research ("OFR") - *i.e.* the independent bureau in charge of promoting financial stability by delivering financial data, standards and analysis for the FSOC - are now seeking to collect more accurate data, similarly to what ICMA is doing in the European market. A sound policy proposal in this respect has been advanced by P. Saguato, calling for a two-step policy option to fill the regulatory gaps[334]. His approach

and Öncü assert that the RRA could be used in the event of a repo counterparty default, to make a liquidity payment to the lender in order to retake possession of collateral.

[331] *See* M. Barr, H. Jackson, M. Tahyar, *Financial Regulation: Law and Policy*, 1246. *Also see* V. Acharya, T. Sabri Öncü, *The Repurchase Agreement (Repo) Market*, in V. Acharya, T. Cooley, M. Richardson, I. Walter (eds.), *Regulating Wall Street. The Dodd-Franck Act and the New Architecture of Global Finance*, Hoboken, Wiley, 2011, 345-347. Acharya and Öncü's approach facilitates a ready winding down of repo contracts and prevents disorderly fire sales of the underlying assets. This would allow to provide ex post liquidity to the repo market, rather than a complete guarantee of the underlying risks.

[332] *See* M. Barr, H. Jackson, M. Tahyar, *Financial Regulation: Law and Policy*, 1242-1243.

[333] M. Barr, H. Jackson, M. Tahyar, *Financial Regulation: Law and Policy*, 1243.

[334] *See* P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, also recently published as P. Saguato, *The Liquidity Dilemma and the Repo Market: a*

is based on the possible extension to repos of the rules introduced by Title VIII of the Dodd-Frank Act with regard to OTC derivatives[335]. The first step of this proposal consists of fostering transparency by taking advantage of the role of trade repositories (TRs) as market utilities which could collect, store, process and disseminate data on the repo market, similarly to what TRs are already doing in derivatives market[336]. The second step, once opacity in the market is reduced by mandatory disclosure requirements with trading repositories, is built around the role of financial market infrastructures ("FMI") - *i.e.* trading venues and central clearing counterparties[337]. On the one hand, trading venues would enhance transparency, efficiency, price discovery and standardization of contractual terms in the market. On the other hand, CCPs could mitigate systemic and counterparty credit risk and would also regulate potential conflict of interests, especially in the triparty market[338].

Other reform proposals include the implementation of mandatory haircut standards for securities financing transactions. The FSB has called for a theoretical framework for determining numerical haircut floors on repos in order to provide a cushion in the event of deterioration in the value of collateral and as a mean to reduce leverage and overreliance on short-term funding[339]. The FSB has also suggested to impose investment constraints with the aim of limiting the duration of assets purchasable with cash collateral and the reuse/rehypothecation of assets as well as establishing minimum requirements for

Two-Step Policy Option to Address the Regulatory Void, 22 Stanford Journal of Law, Business and Finance, 2017, 85 ff.

335 The idea of extending the application of Title VIII of the Dodd-Frank Act to repurchase agreements is also shared by M. Barr, H. Jackson, M. Tahyar, *Financial Regulation: Law and Policy*, 1244-1245, where the authors point out that regulators could designate further systemic activities in order to prescribe rules to the wholesale funding industry, including, but not limited to, mandating the quality of eligible collateral, mandatory margin haircuts, rehypothecation rules and other clearing and settlement procedures. Also, Title VIII may reduce systemic and idiosyncratic risks arising from shadow banking activities related to repo transactions.

336 P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 43-44. For an overview of the role of TRs in the US derivatives markets, *see* G. Ferrarini, P. Saguato, *Regulating Financial Market Infrastructures*, 28 ff.

337 For an overview of the current trends related to financial market infrastructures in the US, *see* G. Ferrarini, P. Saguato, *Regulating Financial Market Infrastructures*, 28 ff. We have already discussed the benefits of CCPs in this very chapter at paragraph 3.2.1.

338 P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void*, 126 ff. Specifically, Saguato advocates for the creation of a standalone specialized CCP in order to increase the competitiveness in the repo market, although it might also increase operational costs. The idea of a dedicated triparty repo clearing utility has been also proposed by professor Darrell Duffie.

339 M. Barr, H. Jackson, M. Tahyar, *Financial Regulation: Law and Policy*, 1244. This would mean that the size of the haircut would be a function of both the type of collateral asset and the asset's remaining term to maturity, *see* J. Armour, D. Awrey, P. Davies, L. Enriques, J. N. Gordon, C. Mayer, J. Paine, *Principles of Financial Regulation*, 459. However, this approach has been criticized because mandatory haircuts could impair the funding of financial intermediary and decrease the efficiency and liquidity of financial markets.

collateral quality[340]. The FSB's proposals are intended to reduce systemic underpricing within repo markets, to limit the amount of leverage taken via repo funding and as a mean to protect market participants from the consequences of institutional instability[341].

Another elaborate proposal comes from G. Gorton and A. Metrick[342], focusing on licenses, eligible collateral and minimum haircuts. Specifically, the authors proposed the creation of a binary repo market where there are two different categories of allowable repos: the first category would be traded by banks. This category would capture the monetary function of repos and be regulated by using minimum haircuts analogues to capital requirements. The second category of repos would be undertaken by non-bank entities holding a special license and be regulated to make this category more expensive than the first one[343]. More in detail, in their view:

(i) banks should be allowed to engage in repo financing, while other entities would be able to engage in repos only after obtaining a special license;

(ii) banks' eligible collateral would only consist of US Treasury securities, liabilities of other bank and other appropriate asset classes;

(iii) non-bank entities could use any security as collateral, but the latter would be subject to minimum haircuts and position limits set by the regulators, according to the firm's size and the type of collateral used;

(iv) minimum haircuts would limit rehypothecation[344].

Along the same lines, M. Ricks has proposed the establishment of a private-public partnership system, in which repo issuers would need a license and would be subject to portfolio restrictions and other prudential requirements. Finally, a public authority would provide some risk-based deposit insurance in order to reduce the likeliness of runs[345].

By way of conclusion, the most challenging - yet needed - reform involves the US triparty repo market. Back in 2009, the New York Fed created a "Task Force" in order to investigate the risks associated with the tri-party repo infrastructure on the basis that "*a stable and well-functioning tri-party repo market is critical to the health and stability of*

[340] J. Armour, D. Awrey, P. Davies, L. Enriques, J. N. Gordon, C. Mayer, J. Paine, *Principles of Financial Regulation*, 459.
[341] J. Armour, D. Awrey, P. Davies, L. Enriques, J. N. Gordon, C. Mayer, J. Paine, *Principles of Financial Regulation*, 460.
[342] *See* G. Gorton, A. Metrick, *Regulating the Shadow Banking System,* 2010, available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1676947.
[343] G. Gorton, A. Metrick, *Regulating the Shadow Banking System*, 25.
[344] G. Gorton, A. Metrick, *Regulating the Shadow Banking System*, 23-24.
[345] J. Armour, D. Awrey, P. Davies, L. Enriques, J. N. Gordon, C. Mayer, J. Paine, *Principles of Financial Regulation*, 460. *See* M. Ricks, *Money and (Shadow) Banking: a Thought Experiment,* 31 Review of Banking & Financial Law, 2011, 731 ff.; M. Ricks, *Regulating Money Creation After the Crisis,* 76(1) Harvard Business Law Review, 2011, 75 ff.; M. Ricks, *Shadow Banking and Financial Regulation,* 2010, Columbia Law and Economics Working Paper No. 370.

the U.S. financial markets and the U.S. economy [...]"[346]. The Task Force found that *"to strengthen the resiliency of the tri-party repo infrastructure in stressed market conditions, the Federal Reserve looks to market participants to reduce reliance on intraday credit, make risk management practices more robust to a broad range of events, and take steps to reduce the risk that a dealer's default could prompt destabilizing fire sales of its collateral by its lenders"*[347]. In line with these findings, the Task Force proposed two main adjustments:

(i) to develop an "auto-substitution" functionality to allow dealers to access and substitute the encumbered collateral in order to facilitate the settlement without the daily unwind, while the remaining intraday credit would be extended under predefined bilateral agreements with the clearing banks;

(ii) to eliminate the unwind process from the term triparty market as much as possible, because the collateral which is funded on a term basis is not actively traded[348].

The two active US custodian banks and triparty market participants did take actions to directly implement these proposals to their back-office procedures, documentation practices and trading systems[349]. Although these reforms have somehow stabilized the US triparty market, some risks may still arise from the failure of a major seller and its subsequent liquidation in times of market stress[350].

[346] *See* M. Barr, H. Jackson, M. Tahyar, *Financial Regulation: Law and Policy*, 1230; *see also* H. Scott, *Interconnectedness and Contagion. Financial Panics and the Crisis of 2008*, 64-65; V. Acharya, T. Sabri Öncü, *The Repurchase Agreement (Repo) Market,* 327-329.
[347] *See* https://www.newyorkfed.org/banking/tpr_infr_reform.html.
[348] V. Acharya, T. Sabri Öncü, *The Repurchase Agreement (Repo) Market,* 328-329.
[349] C. A. Johnson, *Pushing Shadow Banking into the Light: Reforming the US Tri-party Repo Market*, in I.H-Y. Chiu, I. G. MacNeil (eds.), *Research Handbook on Shadow Banking. Legal and Regulatory Aspects,* Cheltenham, Edward Elgar Publishing, 2018, 169. For instance, the unwind process, known as the settlement window, is now carried out around 3.30 pm in New York and the clearing bank will just substitute eligible securities in and out of a buyer's account, without actually extending much credit.
[350] C. A. Johnson, *Pushing Shadow Banking into the Light: Reforming the US Tri-party Repo Market*, 170-171.

CONCLUSION

This survey sought to scrutinize the legal and economic foundations of the repurchase agreement's structure and regulatory regime from a comparative legal standpoint. The examination has unearthed both common features and substantial differences in the legal framework, practice and regulation of repurchase agreements in Europe and in the United States. On the basis of these findings, we shall endeavor to summarize the main distinguishing features and to discuss the way forward.

It must be recalled that repo transactions are widely executed in both common law and civil law jurisdictions, but a comparative survey of the contractual scheme shows that their legal construct is essentially different. As argued multiple times, in Europe legal title of the underlying collateral is transferred from the seller to the buyer of the securities by means of an outright transfer of legal ownership, thereby making the European repo transaction a legal true sale - or, in the wording of the Financial Collateral Directive, a title transfer collateral arrangement. Conversely, in the United States, the collateral in the transaction is formally pledged, but it is simultaneously exempted from the automatic stay, through special "safe harbors" provisions, so that - in the event of a party's insolvency - the counterparty holding the securities may liquidate them and accelerate or terminate the agreement. The peculiar treatment of US-based repo agreements, coupled with the right of rehypothecation of collateral, imprints on the transaction the same economic outcome as a true sale. Albeit describing the state of the art through an overview of the relevant bankruptcy provisions - also highlighting the ongoing scholarly debate over the advisability of repealing safe harbors - we believe it is safe to say that there will be considerable legal and economic debate regarding the bankruptcy treatment of repos in the future, especially in the United States, possibly leading to legislative amendments. Regardless of actual legal status, both legal systems allow for bilateral and tri-party delivery structures. However, while bilateral settlement is widely used in both European and American over-the-counter markets, collateral management in the US is mostly conducted via the tri-party scheme - increasingly in the form of General Collateral Finance Repurchase Agreements, where only collateral of the highest quality can be cleared with the Fixed Income Clearing Corporation acting as tri-party agent - whereas in Europe the tri-party sector plays a relatively small part. On the other hand, repos in the European market are mostly cleared through central clearing counterparties, using electronic repo trading systems. Also, US-based repo agreements are generally processed

overnight, while Europe-based agreements tend to take a little longer (from two days to one week). In addition, it must be recalled that in both legal systems sellers and buyers look for underlying collateral with the lowest counterparty and liquidation risk, therefore it is no surprise that in Europe government securities are dominant, while in the US both Treasuries and other government-sponsored agency securities are overwhelmingly used. From an institutional perspective, the infrastructure of the European market is different from the American one, as a consistent number of euro repo transactions are conducted in the interbank market, reflecting the continental bank-based system. This implicates that European repo transactions are not entirely settled in the shadow banking system. Accordingly, market participants are mostly banking institutions - including commercial, retail, and investment firms, as well as national central banks. Conversely, in the United States, a securities dealer is generally involved in the transaction, operating as an intermediary between cash lenders and cash borrowers. Therefore, market participants are mostly institutional investors of cash pools, such as money market mutual funds acting as lenders on one side, and broker-dealers acting as borrowers on the other. Also, the American market is more entangled with the shadow banking sector.

All this being said, we argue that further discussions regarding the law and economics of repurchase agreements should be dealt with in view of the cross-continental regulatory toolkit. In order to provide meaningful observations and to foster future discussions of the current global framework, we consider once again the main traits of repo market regulation. Indeed, regulatory initiatives are driving the change in the global financial ecosystem in which repos thrive. However, the regulatory discussion on repos has led to some apparent misunderstandings. On the one hand, it has been argued - correctly - that repos have not been subject to intensive direct regulations when compared to other segments of the financial market. Accordingly, those sharing this point of view have speculated on the detrimental consequences of the alleged regulatory void[1]. On the other hand, however, the repo market has been impacted by an increasing number of different regulatory frameworks - especially those concerning prudential regulation of capital and liquidity requirements. These frameworks are set to impose constraining rules on other branches of financial activity, but in fact end up indirectly affecting repo markets to a considerable extent. Actually, one could also rightly argue that these kinds of "indirect" regulation were implemented to explicitly target repurchase agreements and short-term funding in general. On the basis of these observations, we agree with those

[1] *See, inter alia*, P. Saguato, *The Liquidity Dilemma and the Repo Market: a Two-Step Policy Option to Address the Regulatory Void,* 22 Stanford Journal of Law, Business and Finance, 2017, 85 ff.

who argue that repurchase agreements should not be regarded as under-regulated financial products[2]. Against this backdrop, a comparative assessment of the relevant regulatory toolkit reveals that the challenges faced by the repo market are essentially the same in Europe and in the United States. To understand the full implications of recent regulatory developments for the repo market - and before delving into the bulk of the consequences of liquidity and capital regulations - we need to recall and summarize once again the main initiatives reforming repo rules. As argued multiple times in this survey, European and American repo markets are subject to structural fragilities. In an effort to improve the resiliency of the market, regulators and policy makers have developed their long-term regulatory strategies in three main areas, which amount to as many "hot topics" in the ongoing debate regarding repo markets.

A first point of global concern is rehypothecation of collateral - *i.e.* using the underlying securities posted in the transaction as collateral for another repo agreement. The fact that parties may engage in rehypothecation several times during the life of a transaction allows for the creation of so-called "collateral chains" that give rise to a number of competing claims against the same assets[3]. On the one hand, the right to reuse collateral may exacerbate instability when, upon default, a party fails to return the rehypothecated securities (unless the collateral chain is supported by "ultra-safe assets")[4]. On the other hand, a pervasive reuse of collateral that allows more cash to be borrowed may increase leverage, which is then used to take bigger positions in the market[5]. Provided that there are differences in legal systems, the Financial Stability Board (FSB) has sought to suggest a global response to answer the fragilities rooted in collateral dynamics by focusing on the practice of haircuts. As the reader should recall, the haircut is the difference between the market value of an asset and the purchase price paid at the start of the repo: if the seller defaults, the buyer might suffer losses while completing the liquidation process, therefore parties apply a haircut on the collateral by setting the purchase price below the market value of the collateral itself[6]. Instead of radically limiting rehypothecation rights - which is the US approach we already discussed, that mandates a limit to the amount of collateral that can be repledged - the FSB suggested imposing

[2] *See, inter alia,* J. Cullen*, The Repo Market, Collateral and Systemic Risk: in Search of Regulatory Coherence,* in I. H.-Y. Chiu, I. G. MacNeil (eds.), *Research Handbook on Shadow Banking. Legal and Regulatory Aspects,* Cheltenham, Edward Elgar Publishing, 2018, 85 ff.
[3] J. Cullen*, The Repo Market, Collateral and Systemic Risk: in Search of Regulatory Coherence*, 95.
[4] J. Cullen*, The Repo Market, Collateral and Systemic Risk: in Search of Regulatory Coherence*, 97.
[5] J. Cullen*, The Repo Market, Collateral and Systemic Risk: in Search of Regulatory Coherence*, 94.
[6] International Capital Market Association (ICMA), *A Guide to Best Practice in the European Repo Market,* 2017, 80, available at https://www.icmagroup.org/Regulatory-Policy-and-Market-Practice/repo-and-collateral-markets/icma-ercc-publications/icma-ercc-guide-to-best-practice-in-the-european-repo-market/.

mandatory minimum haircuts on certain classes of repo transactions, namely non-bank and non-centrally cleared repos[7]. Accordingly, this framework does not apply to repos cleared through a central counterparty; to banks that meet adequate capital and liquidity requirements; to repos collateralized by high-quality government bonds or to central banks' repo transactions[8]. In this context, minimum haircuts are essentially employed as (macro)prudential tools to mitigate pro-cyclicality, because regulators are concerned that changes in haircuts might amplify cycles of financial activity[9]. In other words, on the one hand an increase in haircuts in response to a loss of confidence might reduce liquidity in the market, pushing for a widespread sale of assets[10]. On the other, a reduction in haircuts in response to cyclical improvement in credit and liquidity conditions might drive asset prices up to levels that do not reflect their actual value[11]. To this end, the imposition of stable minimum haircuts is perceived as a means of achieving overall stability in critical market conditions.

A second issue in the transatlantic regulatory agenda is transparency in the repo market. Once again, the FSB has called for more consistent collecting of information to give both regulators and market participants reliable data to evaluate risks and potential market developments. In the United States, the Federal Reserve and the Financial Stability Oversight Council publish statistics that measure value, composition and aggregates of assets and liabilities in the repo market - including those of tri-party markets through the Tri-Party Repo Infrastructure Task Force[12] based at the New York Federal Reserve[13]. Europe, on the contrary, has paid considerably more attention to transparency. The Securities Financing Transactions Regulation - Regulation (EU) 2015/2365 - has imposed reporting requirements on repo transactions[14]. It is also worth remembering that many repo trades in Europe are executed electronically and are therefore visible to the

[7] J. Cullen, *The Repo Market, Collateral and Systemic Risk: in Search of Regulatory Coherence*, 97. *See* Financial Stability Board (FSB), *Transforming Shadow Banking into Resilient Market-based Finance. Regulatory Framework for Haircuts on Non-Centrally Cleared Securities Financing Transactions,* 2015, available at http://www.fsb.org/wp-content/uploads/SFT_haircuts_framework.pdf.
[8] J. Cullen, *The Repo Market, Collateral and Systemic Risk: in Search of Regulatory Coherence*, 98.
[9] R. Comotto, *Frequently Asked Questions on Repo,* International Capital Market Association, 2015, 27, available at https://www.icmagroup.org/Regulatory-Policy-and-Market-Practice/repo-and-collateral-markets/icma-ercc-publications/frequently-asked-questions-on-repo/
[10] R. Comotto, *Frequently Asked Questions on Repo,* 27.
[11] R. Comotto, *Frequently Asked Questions on Repo,* 27.
[12] C. Johnson, *Pushing Shadow Banking into the Light: Reforming the US Tri-party Repo Market,* in. H.-Y. Chiu, I. G. MacNeil (eds.), *Research Handbook on Shadow Banking. Legal and Regulatory Aspects,* Cheltenham, Edward Elgar Publishing, 2018, 168-169.
[13] J. Cullen, *The Repo Market, Collateral and Systemic Risk: in Search of Regulatory Coherence*, 99.
[14] J. Cullen, *The Repo Market, Collateral and Systemic Risk: in Search of Regulatory Coherence*, 99.

market[15]. In addition, the semi-annual ICMA European Repo Market Survey offers valuable data and statistics. Against this backdrop, if we agree that more transparency is deemed necessary, we also believe that regulatory efforts are going down the right road.

Finally, the third global issue on which the evolution of repo is built is the establishment of risk-sharing mechanisms. As J. Cullen has rightly pointed out, the practical mutualization of risks in repo transactions can be achieved either through tri-party arrangements or through the clearance of repos by central clearing counterparties (CCPs)[16]. The common rationale for these two viable alternatives is to enhance financial stability whenever consistent defaults occur in the repo market. As outlined many times in our survey, the tri-party scheme is a key feature of the American market. However, per se, the tri-party structure does not formally involve the mutualization of default risks, but rather offers collateral management services that reduce operational and legal risks[17]. Nevertheless, the economic outcome with regard to market stability is substantially the same. Therefore, we can assume this is the logical route that regulators will follow for improving risk mitigation in the US framework. In Europe, on the contrary, CCP clearing - a true risk mutualization infrastructure - is prevalent. As already explained in the previous pages, CCPs novate the repo transaction, interposing themselves between counterparties, assuming their rights and obligations and guaranteeing performance in case of a party's default[18]. Accordingly, the European repo market architecture will reasonably develop further on central clearing dynamics, and broadly, on Financial Market Infrastructures.

Although the abovementioned initiatives have been important in addressing repo's' fragilities, we argue that other regulatory frameworks have had greater impact on the cross-continental repo market. We are specifically referring to the Basel III Capital Accord - developed under the auspices of the Basel Committee on Banking Supervision (BCBS) based at the Bank for International Settlements (BIS) - which reformed capital and liquidity requirements. Overall, the increase in capital requirements for those financial institutions systematically involved in repo transactions will result in significant constraints on market activity[19]. Specifically, each of the four components of the Basel

[15] R. Comotto, *Shadow Banking and Repo,* International Capital Market Association, 2012, 21, available at https://www.icmagroup.org/Regulatory-Policy-and-Market-Practice/repo-and-collateral-markets/icma-ercc-publications/icma-ercc-reports/shadow-banking-and-repo/
[16] J. Cullen*, The Repo Market, Collateral and Systemic Risk: in Search of Regulatory Coherence*, 99-100.
[17] J. Cullen*, The Repo Market, Collateral and Systemic Risk: in Search of Regulatory Coherence*, 100.
[18] J. Cullen*, The Repo Market, Collateral and Systemic Risk: in Search of Regulatory Coherence*, 100.
[19] International Capital Market Association (ICMA)/Global Financial Markets Association (GFMA), *The GFMA and ICMA Repo Market Study: Post-Crisis Reforms and the Evolution of the Repo and Broader SFT Markets,* 2018, 5, available at http://www.gfma.org/correspondence/item.aspx?id=1046.

III framework - Risk Capital Requirements, Leverage Ratio, Liquidity Coverage Ratio, Net Stable Funding Ratio - will lead to an increase in the cost of capital and liquidity required to trade in repurchase agreements[20]. Having already discussed the Basel III framework against the backdrop of its implementation in the European and American scenario, we shall now try to provide a brief snapshot of its impact in a global context. First, the Risk Capital Requirements mandates banks to hold a minimum ratio of common equity in relation to the value of their risk weighted assets (RWA) - *i.e.* banks' assets weighted according to risk used to determine the minimum amount of capital to be held in order to mitigate the risk of insolvency[21]. This requirement will have the effect of discouraging repo transactions involving lower quality assets or lower rated counterparties, because holding this type of assets will be more capital expensive[22]. Second, the Leverage Ratio is the ratio of a financial institution's capital to its assets[23]. Specifically, it is a non-risk-based indicator measuring the ratio of a bank's capital to its total balance sheet assets, including securities financing transactions such as repos[24]. European banks are subject to a 3% Leverage Ratio, whereas the US framework mandates a more stringent 5-6% ratio for globally systemically important banks (in the form of a Supplementary Leverage Ratio required under the Dodd-Frank Act)[25]. Accordingly, once again, the cost of capital required to undertake on-balance sheet repo trading will increase, making repurchase agreements an unprofitable instrument. For the purposes of the Leverage Ratio repo transactions are considered on-balance sheet activities, despite their low risk profile, thus increasing the capital requirements[26]. This is because, under the Leverage Ratio, repurchase agreements are treated as unsecured instruments for regulatory purposes and a potential differentiation based on quality of the collateral is not even considered[27]. Third, the Liquidity Coverage Ratio requires banks to hold more high-quality liquid assets (HQLAs)[28]. HQLAs should have low credit and market risk; their

[20] International Capital Market Association (ICMA), *Perspectives from the Eye of the Storm. The Current State and Future Evolution of the European Repo Market,* 2015, 10, available at https://www.icmagroup.org/resources/icma-publications-and-services/icma-reports/.
[21] International Capital Market Association (ICMA), *Perspectives from the Eye of the Storm. The Current State and Future Evolution of the European Repo Market*, 18.
[22] International Capital Market Association (ICMA), *Perspectives from the Eye of the Storm. The Current State and Future Evolution of the European Repo Market*, 19.
[23] Bank of New York Mellon, *Securities Finance: Regulatory Update,* 2016, 2, available at https://www.bnymellon.com/us/en/our-thinking/securities-finance-regulatory-update-june-2016.jsp.
[24] C. Georgiou, J. Haines, *Understanding Repo and the GMRA,* Apollo Legal/Ashurst/ICMA, 2017, 145.
[25] International Capital Market Association (ICMA), *Perspectives from the Eye of the Storm. The Current State and Future Evolution of the European Repo Market*, 11.
[26] J. Cullen*, The Repo Market, Collateral and Systemic Risk: in Search of Regulatory Coherence*, 104.
[27] S. Wu, H. Nabilou, *Repo Markets Across the Atlantic: Similar but Unalike,* Forthcoming European Business Law Review, 2019, 35, available at https://ssrn.com/abstract=3165720.
[28] S. Wu, H. Nabilou, *Repo Markets Across the Atlantic: Similar but Unalike*, 36.

value should be easy to calculate so they can be quickly sold in private markets; they should remain liquid in times of financial stress and be central-bank eligible[29]. Specifically, an institution should hold enough HQLAs to cover projected net cash outflows on a stressed basis for a 30-day period[30]. As a result, short-term funding under 30 days becomes much less viable and, vice versa, reliance on longer-term liabilities is the natural alternative. Fourth, the Net Stable Funding Ratio measures liquidity on a forward-looking one-year basis[31]. In sum, it stipulates that banks have to adopt a stable funding strategy in relation to the composition and maturity of their assets, hence also limiting overreliance on short-term wholesale financing[32].

Against this backdrop, the market for repurchase agreements will arguably change in the medium-long term. Liquidity and capital requirements will impact the jurisdictions subject to our comparative analysis in a slightly different manner. Indeed, implementation of global regulatory standards does not occur uniformly across legal systems. There are, and there will always be, regional divergences in the way international regulatory frameworks are transposed. This is because the American and European repo markets are characterized by a number of idiosyncrasies in their legal underpinnings, structure and market participants[33]. Overall, we assume that the more stringent US framework will cause a contraction of the repo market, at least in the short term. Thus, it remains to be seen whether US market participants will devise new practical remedies, or simply choose to invest in other financial instruments. Conversely, the European scenario has already proved to be adaptable to new regulations, as demonstrated by recent market growth.

All the above considered, we want to emphasize once again that the comparative approach should be the preferred analytical tool to scrutinize the ever-evolving legal and economic dynamics of cross-continental financial regulatory frameworks.

[29] International Capital Market Association (ICMA), *A Guide to Best Practice in the European Repo Market,* 104.
[30] International Capital Market Association (ICMA), *Perspectives from the Eye of the Storm. The Current State and Future Evolution of the European Repo Market*, 16.
[31] International Capital Market Association (ICMA), *Perspectives from the Eye of the Storm. The Current State and Future Evolution of the European Repo Market*, 19.
[32] Bank for International Settlements (BIS), *Repo Market Functioning*, 2017, 61, available at https://www.bis.org/cgfs/.
[33] S. Wu, H. Nabilou, *Repo Markets Across the Atlantic: Similar but Unalike*, 37.

APPENDIX

2011 GLOBAL MASTER REPURCHASE AGREEMENT (GMRA)

Securities Industry and Financial Markets Association
New York Washington
www.sifma.org

International Capital Market Association
Talacker 29, 8001 Zurich, Switzerland
www.icmagroup.org

2011 version

Global Master Repurchase Agreement

Dated as of _____

Between:

_____ **("Party A")**

and

_____ **("Party B")**

1. Applicability

(a) From time to time the parties hereto may enter into transactions in which one party, acting through a Designated Office, ("Seller") agrees to sell to the other, acting through a Designated Office, ("Buyer") securities or other financial instruments ("Securities") (subject to paragraph 1(c), other than equities and Net Paying Securities) against the payment of the purchase price by Buyer to Seller, with a simultaneous agreement by Buyer to sell to Seller Securities equivalent to such Securities at a date certain or on demand against the payment of the repurchase price by Seller to Buyer.

(b) Each such transaction (which may be a repurchase transaction ("Repurchase Transaction") or a buy and sell back transaction ("Buy/Sell Back Transaction")) shall be referred to herein as a "Transaction" and shall be governed by this Agreement, including any supplemental terms or conditions contained in Annex I and any annex specified in Annex I, unless otherwise agreed in writing.

(c) If this Agreement may be applied to -

(i) Buy/Sell Back Transactions, this shall be specified in Annex I hereto, and the provisions of the Buy/Sell Back Annex shall apply to such Buy/Sell Back Transactions;

(ii) Net Paying Securities, this shall be specified in Annex I hereto and the provisions of Annex I, paragraph 1(b) shall apply to Transactions involving Net Paying Securities.

2. Definitions

(a) "Act of Insolvency" shall occur with respect to any party hereto upon -

(i) its making a general assignment for the benefit of, or entering into a reorganisation, arrangement, or composition with, creditors; or

(ii) a secured party taking possession of, or carrying out other enforcement measures in relation to, all or substantially all assets of such party, provided the relevant process is not dismissed, discharged, stayed or restrained within 15 days; or

(iii) its becoming insolvent or becoming unable to pay its debts as they become due or failing or admitting in writing its inability generally to pay its debts as they become due; or

(iv) its seeking, consenting to or acquiescing in the appointment of any trustee, administrator, receiver or liquidator or analogous officer of it or any material part of its property; or

(v) the presentation or filing of a petition in respect of it (other than by the other party to this Agreement in respect of any obligation under this Agreement) in any court or before any agency or the commencement of any proceeding by any Competent Authority alleging or for the bankruptcy, winding-up or insolvency of such party (or any analogous proceeding) or seeking any reorganisation, arrangement, composition, re-adjustment, administration, liquidation, dissolution or similar relief under any present or future statute, law or regulation, such petition not having been stayed or dismissed within 15 days of its filing (except in the case of a petition presented by a Competent Authority or for winding-up or any analogous proceeding, in respect of which no such 15 day period shall apply); or

(vi) the appointment of a receiver, administrator, liquidator, conservator, custodian or trustee or analogous officer of such party or over all or any material part of such party's property; or

(vii) the convening of any meeting of its creditors for the purpose of considering a voluntary arrangement as referred to in section 3 of the Insolvency Act 1986 (or any analogous proceeding);

(b) "Agency Transaction", the meaning specified in paragraph 1 of the Agency Annex to this Agreement as published by ICMA;

(c) "Applicable Rate", in relation to any sum in any currency:

(i) for the purposes of paragraph 10, the rate selected in a commercially reasonable manner by the non-Defaulting Party;

(ii) for any other purpose, the rate agreed by the parties acting in a commercially reasonable manner;

(d) "Appropriate Market", the meaning specified in paragraph 10;

(e) "Base Currency", the currency indicated in Annex I;

(f) "Business Day" means -

(i) in relation to the settlement of a Transaction or delivery of Securities under this Agreement through a settlement system, a day on which that settlement system is open for business;

(ii) in relation to the settlement of a Transaction or delivery of Securities under this Agreement otherwise than through a settlement system, a day on which banks are open for business in the place where the relevant Securities are to be delivered and, if different, the place in which the relevant payment is to be made; and

(iii) in relation to the payment of any amount under this Agreement not falling within (i) or (ii) above, a day other than a Saturday or a Sunday on which banks are open for business in the principal financial centre of the country of which the currency in which the payment is denominated is the official currency and, if different, in the place where any account designated by the parties for the making or receipt of the payment is situated (or, in the case of a payment in euro, a day on which TARGET2 operates).

(g) "Cash Equivalent Amount" has the meaning given in paragraph 4(h);

(h) "Cash Margin", a cash sum paid or to be paid to Buyer or Seller in accordance with paragraph 4;

(i) "Competent Authority", a regulator, supervisor or any similar official with primary insolvency, rehabilitative or regulatory jurisdiction over a party in the jurisdiction of its incorporation or establishment or the jurisdiction of its head office;

(j) "Confirmation", the meaning specified in paragraph 3(b);

(k) "Contractual Currency", the meaning specified in paragraph 7(a);

(l) "Defaulting Party", the meaning specified in paragraph 10;

(m) "Default Market Value", the meaning specified in paragraph 10;

(n) "Default Notice", a written notice served by the non-Defaulting Party on the Defaulting Party under paragraph 10(b) designating a day as an Early Termination Date;

(o) "Deliverable Securities", the meaning specified in paragraph 10;

(p) "Designated Office", a branch or office which is specified as such in Annex I or such other branch or office as may be agreed in writing by the parties;

(q) "Distribution(s)", the meaning specified in sub-paragraph (y) below;

(r) "Early Termination Date", the date designated as such in a Default Notice or as otherwise determined in accordance with paragraph 10(b);

(s) "Electronic Messaging System", an electronic system for communication capable of reproducing communication in hard copy form, including email;

(t) "Equivalent Margin Securities", Securities equivalent to Securities previously transferred as Margin Securities;

(u) "Equivalent Securities", with respect to a Transaction, Securities equivalent to Purchased Securities under that Transaction. If and to the extent that such Purchased Securities have been redeemed, the expression shall mean a sum of money equivalent to the proceeds of the redemption (other than Distributions);

(v) Securities are "equivalent to" other Securities for the purposes of this Agreement if they are: (i) of the same issuer; (ii) part of the same issue; and (iii) of an identical type, nominal value, description and (except where otherwise stated) amount as those other Securities, provided that -

(A) Securities will be equivalent to other Securities notwithstanding that those Securities have been redenominated into euro or that the nominal value of those Securities has changed in connection with such redenomination; and

(B) where Securities have been converted, subdivided or consolidated or have become the subject of a takeover or the holders of Securities have become entitled to receive or acquire other Securities or other property or the Securities have become subject to any similar event other than a Distribution, the expression "equivalent to" shall mean Securities equivalent to (as defined in the provisions of this definition preceding the proviso) the original Securities together with or replaced by a sum of money or Securities or other property equivalent to (as so defined) that receivable by holders of such original Securities resulting from such event;

(w) "Event of Default", the meaning specified in paragraph 10;

(x) "Forward Transaction", the meaning specified in paragraph 2(c)(i) of Annex I;

(y) "Income", with respect to any Security at any time, all interest, dividends or other distributions thereon, including distributions which are a payment or repayment of principal in respect of the relevant securities ("Distribution(s)");

(z) "Income Payment Date", with respect to any Securities, the date on which Income is

paid in respect of such Securities or, in the case of registered Securities, the date by reference to which particular registered holders are identified as being entitled to payment of Income;

(aa) "Margin Percentage", with respect to any Margin Securities or Equivalent Margin Securities, the percentage, if any, agreed by the parties acting in a commercially reasonable manner;

(bb) "Margin Ratio", with respect to a Transaction, the Market Value of the Purchased Securities at the time when the Transaction was entered into divided by the Purchase Price (and so that, where a Transaction relates to Securities of different descriptions and the Purchase Price is apportioned by the parties among Purchased Securities of each such description, a separate Margin Ratio shall apply in respect of Securities of each such description), or such other proportion as the parties may agree with respect to that Transaction;

(cc) "Margin Securities", in relation to a Margin Transfer, Securities of the type and value (having applied Margin Percentage, if any) reasonably acceptable to the party calling for such Margin Transfer;

(dd) "Margin Transfer", any, or any combination of, the payment or repayment of Cash Margin and the transfer of Margin Securities or Equivalent Margin Securities;

(ee) "Market Value", with respect to any Securities as of any time on any date, the price for such Securities (after having applied the Margin Percentage, if any, in the case of Margin Securities) at such time on such date obtained from a generally recognised source agreed by the parties or as otherwise agreed by the parties (and where different prices are obtained for different delivery dates, the price so obtainable for the earliest available such delivery date) having regard to market practice for valuing Securities of the type in question plus the aggregate amount of Income which, as at such date, has accrued but not yet been paid in respect of the Securities to the extent not included in such price as of such date, and for these purposes any sum in a currency other than the Contractual Currency for the Transaction in question shall be converted into such Contractual Currency at the Spot Rate prevailing at the time of the determination;

(ff) "Net Exposure", the meaning specified in paragraph 4(c);

(gg) the "Net Margin" provided to a party at any time, the excess (if any) at that time of (i) the sum of the amount of Cash Margin paid to that party (including accrued interest on such Cash Margin which has not been paid to the other party) and the Market Value of Margin Securities transferred to that party under paragraph 4(a) (excluding any Cash Margin which has been repaid to the other party and any Margin Securities in respect of which Equivalent Margin Securities have been transferred or a Cash Equivalent Amount has been paid to the other party) over (ii) the sum of the amount of Cash Margin paid to the other party (including accrued interest on such Cash Margin which has not been paid by the other party) and the Market Value of Margin Securities

transferred to the other party under paragraph 4(a) (excluding any Cash Margin which has been repaid by the other party and any Margin Securities in respect of which Equivalent Margin Securities have been transferred or a Cash Equivalent Amount has been paid by the other party) and for this purpose any amounts not denominated in the Base Currency shall be converted into the Base Currency at the Spot Rate prevailing at the time of the determination;

(hh) "Net Paying Securities", Securities which are of a kind such that, were they to be the subject of a Transaction to which paragraph 5 applies, any payment made by Buyer under paragraph 5 would be one in respect of which either Buyer would or might be required to make a withholding or deduction for or on account of taxes or duties or Seller might be required to make or account for a payment for or on account of taxes or duties (in each case other than tax on overall net income) by reference to such payment;

(i) "Net Value", the meaning specified in paragraph 10;

(jj) "New Purchased Securities", the meaning specified in paragraph 8(a);

(kk) "Price Differential", with respect to any Transaction as of any date, the aggregate amount obtained by daily application of the Pricing Rate for such Transaction to the Purchase Price for such Transaction (on a 360 day, 365 day or other day basis in accordance with the applicable market convention, unless otherwise agreed between the parties for the Transaction) for the actual number of days during the period commencing on (and including) the Purchase Date for such Transaction and ending on (but excluding) the date of calculation or, if earlier, the Repurchase Date;

(ll) "Pricing Rate", with respect to any Transaction, the per annum percentage rate for calculation of the Price Differential agreed to by Buyer and Seller in relation to that Transaction;

(mm) "Purchase Date", with respect to any Transaction, the date on which Purchased Securities are to be sold by Seller to Buyer in relation to that Transaction;

(nn) "Purchase Price", on the Purchase Date, the price at which Purchased Securities are sold or are to be sold by Seller to Buyer;

(oo) "Purchased Securities", with respect to any Transaction, the Securities sold or to be sold by Seller to Buyer under that Transaction, and any New Purchased Securities transferred by Seller to Buyer under paragraph 8 in respect of that Transaction;

(pp) "Receivable Securities", the meaning specified in paragraph 10;

(qq) "Repurchase Date", with respect to any Transaction, the date on which Buyer is to sell Equivalent Securities to Seller in relation to that Transaction;

(rr) "Repurchase Price", with respect to any Transaction and as of any date, the sum of the Purchase Price and the Price Differential as of such date;

(ss) "Spot Rate", where an amount in one currency is to be converted into a second currency on any date, unless the parties otherwise agree

(i) for the purposes of paragraph 10, the spot rate of exchange obtained by reference to a pricing source or quoted by a bank, in each case specified by the non-Defaulting Party, in the London inter-bank market for the purchase of the second currency with the first currency at such dates and times determined by the non-Defaulting Party; and

(ii) for any other purpose, the latest available spot rate of exchange obtained by reference to a pricing source or quoted by a bank, in each case agreed by the parties (or in the absence of such agreement, specified by Buyer), in the London inter-bank market for the purchase of the second currency with the first currency on the day on which the calculation is to be made or, if that day is not a day on which banks are open for business in London, the spot rate of exchange quoted at close of business in London on the immediately preceding day in London on which such a quotation was available;

(tt) "TARGET2", the Second Generation Trans-European Automated Real-time Gross Settlement Express Transfer System, or any other system that replaces it;

(uu) "Term", with respect to any Transaction, the interval of time commencing with the Purchase Date and ending with the Repurchase Date;

(vv) "Termination", with respect to any Transaction, refers to the requirement with respect to such Transaction for Buyer to sell Equivalent Securities against payment by Seller of the Repurchase Price in accordance with paragraph 3(f), and reference to a Transaction having a "fixed term" or being "terminable upon demand" shall be construed accordingly;

(ww) "Transaction Costs", the meaning specified in paragraph 10;

(xx) "Transaction Exposure", with respect to any Transaction at any time during the period from the Purchase Date to the Repurchase Date (or, if later, the date on which Equivalent Securities are delivered to Seller or the Transaction is terminated under paragraph 10(h) or 10(i)) the amount "E" determined in accordance with (A) or (B) below as specified in Annex I (or as agreed by the parties with respect to particular transactions):

(A) the result of formula E = (R x MR) – MV, where:

R = the Repurchase Price at such time

MR = the applicable Margin Ratio

MV = the Market Value of Equivalent Securities at such time

and so that where the Transaction relates to Securities of more than one description or to which different Margin Ratios apply, E shall be determined by

multiplying the Repurchase Price attributable to Equivalent Securities of each such description by the applicable Margin Ratio and aggregating the results and for this purpose the Repurchase Price shall be attributed to Equivalent Securities of each such description in the same proportions as those in which the Purchase Price was apportioned among the Purchased Securities.

If E is greater than zero, Buyer has a Transaction Exposure equal to E and if E is less than zero, Seller has a Transaction Exposure equal to the absolute value of E; provided that E shall not be greater than the amount of the Repurchase Price on the date of the determination; or

(B) the result of the formula E = R – V, where:

R = the Repurchase Price at such time

V = the Adjusted Value of Equivalent Securities at such time or, where a Transaction relates to Securities of more than one description or to which different haircuts apply, the sum of the Adjusted Values of the Securities of each such description.

For this purpose the "Adjusted Value" of any Securities is their value determined on the basis of the formula, (MV(1 – H)), where:

MV = the Market Value of Equivalent Securities at such time

H = the "haircut" for the relevant Securities, if any, as agreed by the parties from time to time, being a discount from the Market Value of the Securities.

If E is greater than zero, Buyer has a Transaction Exposure equal to E and if E is less than zero, Seller has a Transaction Exposure equal to the absolute value of E; and

(yy) except in paragraphs 14(b)(i) and 18, references in this Agreement to "written" communications and communications "in writing" include communications made through any Electronic Messaging System agreed between the parties.

3. Initiation; Confirmation; Termination

(a) A Transaction may be entered into orally or in writing at the initiation of either Buyer or Seller.

(b) Upon agreeing to enter into a Transaction hereunder Buyer or Seller (or both), as shall have been agreed, shall promptly deliver to the other party written confirmation of such Transaction (a "Confirmation").

The Confirmation shall describe the Purchased Securities (including CUSIP or ISIN or other identifying number or numbers, if any), identify Buyer and Seller and set forth -

(i) the Purchase Date;

(ii) the Purchase Price;

(iii) the Repurchase Date, unless the Transaction is to be terminable on demand (in which case the Confirmation shall state that it is terminable on demand);

(iv) the Pricing Rate applicable to the Transaction;

(v) in respect of each party the details of the bank account(s) to which payments to be made hereunder are to be credited;

(vi) where the Buy/Sell Back Annex applies, whether the Transaction is a Repurchase Transaction or a Buy/Sell Back Transaction;

(vii) where the Agency Annex applies, whether the Transaction is an Agency Transaction and, if so, the identity of the party which is acting as agent and the name, code or identifier of the Principal; and

(viii) any additional terms or conditions of the Transaction;

and may be in the form of Annex II or may be in any other form to which the parties agree.

The Confirmation relating to a Transaction shall, together with this Agreement, constitute prima facie evidence of the terms agreed between Buyer and Seller for that Transaction, unless objection is made with respect to the Confirmation promptly after receipt thereof. In the event of any conflict between the terms of such Confirmation and this Agreement, the Confirmation shall prevail in respect of that Transaction and those terms only.

(c) On the Purchase Date for a Transaction, Seller shall transfer the Purchased Securities to Buyer or its agent against the payment of the Purchase Price by Buyer in accordance with paragraph 6(c).

(d) Termination of a Transaction will be effected, in the case of on demand Transactions, on the date specified for Termination in such demand, and, in the case of fixed term Transactions, on the date fixed for Termination.

(e) In the case of on demand Transactions, demand for Termination shall be made by Buyer or Seller, by telephone or otherwise, and shall provide for Termination to occur after not less than the minimum period as is customarily required for the settlement or delivery of money or Equivalent Securities of the relevant kind.

(f) On the Repurchase Date, Buyer shall transfer to Seller or its agent Equivalent Securities against the payment of the Repurchase Price by Seller (less any amount then payable and unpaid by Buyer to Seller pursuant to paragraph 5).

4. Margin Maintenance

(a) If at any time either party has a Net Exposure in respect of the other party it may by notice to the other party require the other party to make a Margin Transfer to it of an aggregate amount or value at least equal to that Net Exposure.

(b) A notice under sub-paragraph (a) above may be given orally or in writing.

(c) For the purposes of this Agreement a party has a Net Exposure in respect of the other party if the aggregate of all the first party's Transaction Exposures plus any amount payable to the first party under paragraph 5 but unpaid less the amount of any Net Margin provided to the first party exceeds the aggregate of all the other party's Transaction Exposures plus any amount payable to the other party under paragraph 5 but unpaid less the amount of any Net Margin provided to the other party; and the amount of the Net Exposure is the amount of the excess. For this purpose any amounts not denominated in the Base Currency shall be converted into the Base Currency at the Spot Rate prevailing at the relevant time.

(d) To the extent that a party calling for a Margin Transfer has previously paid Cash Margin which has not been repaid or delivered Margin Securities in respect of which Equivalent Margin Securities have not been delivered to it or a Cash Equivalent Amount has not been paid, that party shall be entitled to require that such Margin Transfer be satisfied first by the repayment of such Cash Margin or the delivery of Equivalent Margin Securities but, subject to this, the composition of a Margin Transfer shall be at the option of the party making such Margin Transfer.

(e) Any Cash Margin transferred shall be in the Base Currency or such other currency as the parties may agree.

(f) A payment of Cash Margin shall give rise to a debt owing from the party receiving such payment to the party making such payment. Such debt shall bear interest at such rate, payable at such times, as may be specified in Annex I in respect of the relevant currency or otherwise agreed between the parties, and shall be repayable subject to the terms of this Agreement.

(g) Where Seller or Buyer becomes obliged under sub-paragraph (a) above to make a Margin Transfer, it shall transfer Cash Margin or Margin Securities or Equivalent Margin Securities within the minimum period specified in Annex I or, if no period is there specified, such minimum period as is customarily required for the settlement or delivery of money, Margin Securities or Equivalent Margin Securities of the relevant kind.

(h) Where a party (the "Transferor") becomes obliged to transfer Equivalent Margin Securities and, having made all reasonable efforts to do so, is, for any reason relating to the Securities or the clearing system through which the Securities are to be transferred, unable to transfer Equivalent Margin Securities then

(i) the Transferor shall immediately pay to the other party Cash Margin at least

equal to the Market Value of such Equivalent Margin Securities (and, unless the parties otherwise agree, such Cash Margin shall not bear interest in accordance with paragraph 4(f)); and

(ii) if the failure is continuing for two Business Days or more the other party may by notice to the Transferor require the Transferor to pay an amount (the "Cash Equivalent Amount") equal to the Default Market Value of the Equivalent Margin Securities determined by the other party in accordance with paragraph 10(f) which shall apply on the basis that references to the non-Defaulting Party were to the other party and references to the Early Termination Date were to the date on which notice under this paragraph is effective.

(i) The parties may agree that, with respect to any Transaction, the provisions of sub-paragraphs (a) to (h) above shall not apply but instead that margin may be provided separately in respect of that Transaction in which case -

(i) that Transaction shall not be taken into account when calculating whether either party has a Net Exposure;

(ii) margin shall be provided in respect of that Transaction in such manner as the parties may agree; and

(iii) margin provided in respect of that Transaction shall not be taken into account for the purposes of sub-paragraphs (a) to (h) above.

(j) The parties may agree that any Net Exposure which may arise shall be eliminated not by Margin Transfers under the preceding provisions of this paragraph but by the repricing of Transactions under sub-paragraph (k) below, the adjustment of Transactions under sub-paragraph (l) below or a combination of both these methods.

(k) Where the parties agree that a Transaction is to be repriced under this sub-paragraph, such repricing shall be effected as follows -

(i) the Repurchase Date under the relevant Transaction (the "Original Transaction") shall be deemed to occur on the date on which the repricing is to be effected (the "Repricing Date");

(ii) the parties shall be deemed to have entered into a new Transaction (the "Repriced Transaction") on the terms set out in (iii) to (vi) below;

(iii) the Purchased Securities under the Repriced Transaction shall be Securities equivalent to the Purchased Securities under the Original Transaction;

(iv) the Purchase Date under the Repriced Transaction shall be the Repricing Date;

(v) the Purchase Price under the Repriced Transaction shall be such amount as shall, when multiplied by the Margin Ratio applicable to the Original Transaction, be equal to the Market Value of such Securities on the Repricing Date;

(vi) the Repurchase Date, the Pricing Rate, the Margin Ratio and, subject as aforesaid, the other terms of the Repriced Transaction shall be identical to those of the Original Transaction;

(vii) the obligations of the parties with respect to the delivery of the Purchased Securities and the payment of the Purchase Price under the Repriced Transaction shall be set off against their obligations with respect to the delivery of Equivalent Securities and payment of the Repurchase Price under the Original Transaction and accordingly only a net cash sum shall be paid by one party to the other. Such net cash sum shall be paid within the minimum period specified in sub-paragraph (g) above.

(l) The adjustment of a Transaction (the "Original Transaction") under this sub-paragraph shall be effected by the parties agreeing that on the date on which the adjustment is to be made (the "Adjustment Date") the Original Transaction shall be terminated and they shall enter into a new Transaction (the "Replacement Transaction") in accordance with the following provisions -

(i) the Original Transaction shall be terminated on the Adjustment Date on such terms as the parties shall agree on or before the Adjustment Date;

(ii) the Purchased Securities under the Replacement Transaction shall be such Securities as the parties shall agree on or before the Adjustment Date (being Securities the aggregate Market Value of which at the Adjustment Date is substantially equal to the Repurchase Price under the Original Transaction at the Adjustment Date multiplied by the Margin Ratio applicable to the Original Transaction);

(iii) the Purchase Date under the Replacement Transaction shall be the Adjustment Date;

(iv) the other terms of the Replacement Transaction shall be such as the parties shall agree on or before the Adjustment Date; and

(v) the obligations of the parties with respect to payment and delivery of Securities on the Adjustment Date under the Original Transaction and the Replacement Transaction shall be settled in accordance with paragraph 6 within the minimum period specified in sub-paragraph (g) above.

5. Income Payments

Unless otherwise agreed -

(a) where: (i) the Term of a particular Transaction extends over an Income Payment Date in respect of any Securities subject to that Transaction; or (ii) an Income Payment Date in respect of any such Securities occurs after the Repurchase Date but before Equivalent Securities have been delivered to Seller or, if earlier, the occurrence of an Early Termination Date or the termination of the Transaction under paragraph 10(i)

then Buyer shall on the date such Income is paid by the issuer transfer to or credit to the account of Seller an amount equal to (and in the same currency as) the amount paid by the issuer;

(b) where Margin Securities are transferred from one party ("the first party") to the other party ("the second party") and an Income Payment Date in respect of such Securities occurs before Equivalent Margin Securities are transferred or a Cash Equivalent Amount is paid by the second party to the first party, the second party shall on the date such Income is paid by the issuer transfer to or credit to the account of the first party an amount equal to (and in the same currency as) the amount paid by the issuer;

and for the avoidance of doubt references in this paragraph to the amount of any Income paid by the issuer of any Securities shall be to an amount paid without any withholding or deduction for or on account of taxes or duties notwithstanding that a payment of such Income made in certain circumstances may be subject to such a withholding or deduction.

6. Payment and Transfer

(a) Unless otherwise agreed, all money paid hereunder shall be in immediately available freely convertible funds of the relevant currency. All Securities to be transferred hereunder (i) shall be in suitable form for transfer and shall be accompanied by duly executed instruments of transfer or assignment in blank (where required for transfer) and such other documentation as the transferee may reasonably request, or (ii) shall be transferred through any agreed book entry or other securities clearance system or (iii) shall be transferred by any other method mutually acceptable to Seller and Buyer.

(b) Unless otherwise agreed, all money payable by one party to the other in respect of any Transaction shall be paid free and clear of, and without withholding or deduction for, any taxes or duties of whatsoever nature imposed, levied, collected, withheld or assessed by any authority having power to tax, unless the withholding or deduction of such taxes or duties is required by law. In that event, unless otherwise agreed, the paying party shall pay such additional amounts as will result in the net amounts receivable by the other party (after taking account of such withholding or deduction) being equal to such amounts as would have been received by it had no such taxes or duties been required to be withheld or deducted.

(c) Unless otherwise agreed in writing between the parties, under each Transaction transfer of Purchased Securities by Seller and payment of Purchase Price by Buyer against the transfer of such Purchased Securities shall be made simultaneously and transfer of Equivalent Securities by Buyer and payment of Repurchase Price payable by Seller against the transfer of such Equivalent Securities shall be made simultaneously.

(d) Subject to and without prejudice to the provisions of sub-paragraph 6(c), either party may from time to time in accordance with market practice and in recognition of the practical difficulties in arranging simultaneous delivery of Securities and money waive

in relation to any Transaction its rights under this Agreement to receive simultaneous transfer and/or payment provided that transfer and/or payment shall, notwithstanding such waiver, be made on the same day and provided also that no such waiver in respect of one Transaction shall affect or bind it in respect of any other Transaction.

(e) The parties shall execute and deliver all necessary documents and take all necessary steps to procure that all right, title and interest in any Purchased Securities, any Equivalent Securities, any Margin Securities and any Equivalent Margin Securities shall pass to the party to which transfer is being made upon transfer of the same in accordance with this Agreement, free from all liens (other than a lien granted to the operator of the clearance system through which the Securities are transferred), claims, charges and encumbrances.

(f) Notwithstanding the use of expressions such as "Repurchase Date", "Repurchase Price", "margin", "Net Margin", "Margin Ratio" and "substitution", which are used to reflect terminology used in the market for transactions of the kind provided for in this Agreement, all right, title and interest in and to Securities and money transferred or paid under this Agreement shall pass to the transferee upon transfer or payment, the obligation of the party receiving Purchased Securities or Margin Securities being an obligation to transfer Equivalent Securities or Equivalent Margin Securities.

(g) Time shall be of the essence in this Agreement.

(h) Subject to paragraph 10, all amounts in the same currency payable by each party to the other under any Transaction or otherwise under this Agreement on the same date shall be combined in a single calculation of a net sum payable by one party to the other and the obligation to pay that sum shall be the only obligation of either party in respect of those amounts.

(i) Subject to paragraph 10, all Securities of the same issue, denomination, currency and series, transferable by each party to the other under any Transaction or hereunder on the same date shall be combined in a single calculation of a net quantity of Securities transferable by one party to the other and the obligation to transfer the net quantity of Securities shall be the only obligation of either party in respect of the Securities so transferable and receivable.

(j) If the parties have specified in Annex I that this paragraph 6(j) shall apply, each obligation of a party under this Agreement (the "first party") (other than an obligation arising under paragraph 10) is subject to the condition precedent that none of the events specified in paragraph 10(a) (Events of Default) shall have occurred and be continuing with respect to the other party.

7. Contractual Currency

(a) All the payments made in respect of the Purchase Price or the Repurchase Price of any Transaction shall be made in the currency of the Purchase Price (the "Contractual Currency") save as provided in paragraph 10(d)(ii). Notwithstanding the foregoing, the

payee of any money may, at its option, accept tender thereof in any other currency, provided, however, that, to the extent permitted by applicable law, the obligation of the payer to pay such money will be discharged only to the extent of the amount of the Contractual Currency that such payee may, consistent with normal banking procedures, purchase with such other currency (after deduction of any premium and costs of exchange) for delivery within the customary delivery period for spot transactions in respect of the relevant currency.

(b) If for any reason the amount in the Contractual Currency received by a party, including amounts received after conversion of any recovery under any judgment or order expressed in a currency other than the Contractual Currency, falls short of the amount in the Contractual Currency due and payable, the party required to make the payment will, as a separate and independent obligation, to the extent permitted by applicable law, immediately transfer such additional amount in the Contractual Currency as may be necessary to compensate for the shortfall.

(c) If for any reason the amount in the Contractual Currency received by a party exceeds the amount of the Contractual Currency due and payable, the party receiving the transfer will refund promptly the amount of such excess.

8. Substitution

(a) A Transaction may at any time between the Purchase Date and Repurchase Date, if Seller so requests and Buyer so agrees, be varied by the transfer by Buyer to Seller of Securities equivalent to the Purchased Securities, or to such of the Purchased Securities as shall be agreed, in exchange for the transfer by Seller to Buyer of other Securities of such amount and description as shall be agreed ("New Purchased Securities") (being Securities having a Market Value at the date of the variation at least equal to the Market Value of the Equivalent Securities transferred to Seller).

(b) Any variation under sub-paragraph (a) above shall be effected, subject to paragraph 6(d), by the simultaneous transfer of the Equivalent Securities and New Purchased Securities concerned.

(c) A Transaction which is varied under sub-paragraph (a) above shall thereafter continue in effect as though the Purchased Securities under that Transaction consisted of or included the New Purchased Securities instead of the Securities in respect of which Equivalent Securities have been transferred to Seller.

(d) Where either party has transferred Margin Securities to the other party it may at any time before Equivalent Margin Securities are transferred to it under paragraph 4 request the other party to transfer Equivalent Margin Securities to it in exchange for the transfer to the other party of new Margin Securities having a Market Value at the time at which the exchange is agreed at least equal to that of such Equivalent Margin Securities. If the other party agrees to the request, the exchange shall be effected, subject to paragraph 6(d), by the simultaneous transfer of the Equivalent Margin Securities and new Margin Securities concerned. Where either or both of such

transfers is or are effected through a settlement system in circumstances which under the rules and procedures of that settlement system give rise to a payment by or for the account of one party to or for the account of the other party, the parties shall cause such payment or payments to be made outside that settlement system, for value the same day as the payments made through that settlement system, as shall ensure that the exchange of Equivalent Margin Securities and new Margin Securities effected under this sub-paragraph does not give rise to any net payment of cash by either party to the other.

9. Representations

Each party represents and warrants to the other that -

(a) it is duly authorised to execute and deliver this Agreement, to enter into the Transactions contemplated hereunder and to perform its obligations hereunder and thereunder and has taken all necessary action to authorise such execution, delivery and performance;

(b) it will engage in this Agreement and the Transactions contemplated hereunder (other than Agency Transactions) as principal;

(c) the person signing this Agreement on its behalf is, and any person representing it in entering into a Transaction will be, duly authorised to do so on its behalf;

(d) it has obtained all authorisations of any governmental or regulatory body required in connection with this Agreement and the Transactions contemplated hereunder and such authorisations are in full force and effect;

(e) the execution, delivery and performance of this Agreement and the Transactions contemplated hereunder will not violate any law, ordinance, charter, by-law or rule applicable to it or any agreement by which it is bound or by which any of its assets are affected;

(f) it has satisfied itself and will continue to satisfy itself as to the tax implications of the Transactions contemplated hereunder;

(g) in connection with this Agreement and each Transaction -

(i) unless there is a written agreement with the other party to the contrary, it is not relying on any advice (whether written or oral) of the other party, other than the representations expressly set out in this Agreement;

(ii) it has made and will make its own decisions regarding the entering into of any Transaction based upon its own judgment and upon advice from such professional advisers as it has deemed it necessary to consult;

(iii) it understands the terms, conditions and risks of each Transaction and is willing to assume (financially and otherwise) those risks; and

(h) at the time of transfer to the other party of any Securities it will have the full and unqualified right to make such transfer and that upon such transfer of Securities the other party will receive all right, title and interest in and to those Securities free of any lien (other than a lien granted to the operator of the clearance system through which the Securities are transferred), claim, charge or encumbrance.

On the date on which any Transaction is entered into pursuant hereto, and on each day on which Securities, Equivalent Securities, Margin Securities or Equivalent Margin Securities are to be transferred under any Transaction, Buyer and Seller shall each be deemed to repeat all the foregoing representations. For the avoidance of doubt and notwithstanding any arrangements which Seller or Buyer may have with any third party, each party will be liable as a principal for its obligations under this Agreement and each Transaction.

10. Events of Default

(a) If any of the following events (each an "Event of Default") occurs in relation to either party (the "Defaulting Party", the other party being the "non-Defaulting Party") whether acting as Seller or Buyer -

(i) Buyer fails to pay the Purchase Price upon the applicable Purchase Date or Seller fails to pay the Repurchase Price upon the applicable Repurchase Date; or

(ii) if the parties have specified in Annex I that this sub-paragraph shall apply, Seller fails to deliver Purchased Securities on the Purchase Date or Buyer fails to deliver Equivalent Securities on the Repurchase Date, in either case within the standard settlement time for delivery of the Securities concerned; or

(iii) Seller or Buyer fails to pay when due any sum payable under sub-paragraph (h) or (i) below; or

(iv) Seller or Buyer fails to:

(A) make a Margin Transfer within the minimum period in accordance with paragraph 4(g) or, in the case of an obligation to deliver Equivalent Margin Securities, either to deliver the relevant Equivalent Margin Securities or to pay Cash Margin in accordance with paragraph 4(h)(i) or to pay the Cash Equivalent Amount in accordance with paragraph 4(h)(ii);

(B) where paragraph 4(i) applies, to provide margin in accordance with that paragraph; or

(C) to pay any amount or to transfer any Securities in accordance with paragraphs 4(k) or (l); or

(v) Seller or Buyer fails to comply with paragraph 5; or

(vi) an Act of Insolvency occurs with respect to Seller or Buyer; or

(vii) any representations made by Seller or Buyer are incorrect or untrue in any material respect when made or repeated or deemed to have been made or repeated; or

(viii) Seller or Buyer admits to the other that it is unable to, or intends not to, perform any of its obligations hereunder or in respect of any Transaction; or

(ix) Seller or Buyer being declared in default or being suspended or expelled from membership of or participation in, any securities exchange or suspended or prohibited from dealing in securities by any Competent Authority, in each case on the grounds that it has failed to meet any requirements relating to financial resources or credit rating; or

(x) Seller or Buyer fails to perform any other of its obligations hereunder and does not remedy such failure within 30 days after notice is given by the non-Defaulting Party requiring it to do so,

then sub-paragraphs (b) to (g) below shall apply.

(b) If at any time an Event of Default has occurred and is continuing the non-Defaulting Party may, by not more than 20 days' notice to the Defaulting Party specifying the relevant Event of Default, designate a day not earlier than the day such notice is effective as an Early Termination Date in respect of all outstanding Transactions. If, however, "Automatic Early Termination" is specified in Annex I with respect to the Defaulting Party, then an Early Termination Date in respect of all outstanding Transactions will occur at the time immediately preceding the occurrence with respect to the Defaulting Party of an Act of Insolvency which is the presentation of a petition for winding-up or any analogous proceeding or the appointment of a liquidator or analogous officer of the Defaulting Party.

(c) If an Early Termination Date occurs, the Repurchase Date for each Transaction hereunder shall be deemed to occur on the Early Termination Date and, subject to the following provisions, all Cash Margin (including interest accrued) shall be repayable and Equivalent Margin Securities shall be deliverable and Cash Equivalent Amounts shall be payable, in each case on the Early Termination Date (and so that, where this sub-paragraph applies, performance of the respective obligations of the parties with respect to the delivery of Securities, the payment of the Repurchase Prices for any Equivalent Securities, the repayment of any Cash Margin and the payment of Cash Equivalent Amounts shall be effected only in accordance with the provisions of sub- paragraph (d) below).

(d) (i) The Default Market Values of the Equivalent Securities and any Equivalent Margin Securities to be transferred, the amount of any Cash Margin (including the amount of interest accrued) to be transferred and the Repurchase Prices and Cash Equivalent Amounts to be paid by each party shall be established by the non-Defaulting Party for all Transactions as at the Early Termination Date;

(ii) on the basis of the sums so established, an account shall be taken (as at the Early Termination Date) of what is due from each party to the other under this Agreement (on the basis that each party's claim against the other in respect of the transfer to it of Equivalent Securities or Equivalent Margin Securities under this Agreement equals the Default Market Value therefor and including amounts payable under paragraphs 10(g) and 12) and the sums due from one party shall be set off against the sums due from the other and only the balance of the account shall be payable (by the party having the claim valued at the lower amount pursuant to the foregoing). For the purposes of this calculation, all sums not denominated in the Base Currency shall be converted into the Base Currency at the Spot Rate; and

(iii) as soon as reasonably practicable after effecting the calculation above, the non-Defaulting Party shall provide to the Defaulting Party a statement showing in reasonable detail such calculations and specifying the balance payable by one party to the other and such balance shall be due and payable on the Business Day following the date of such statement provided that, to the extent permitted by applicable law, interest shall accrue on such amount on a 360 day, 365 day or other day basis in accordance with the applicable market convention (or as otherwise agreed by the parties), for the actual number of days during the period from and including the Early Termination Date to, but excluding, the date of payment.

(e) For the purposes of this Agreement, the "Default Market Value" of any Equivalent Securities or Equivalent Margin Securities shall be determined by the non-Defaulting Party on or as soon as reasonably practicable after the Early Termination Date in accordance with sub-paragraph (f) below, and for this purpose -

(i) the "Appropriate Market" means, in relation to Securities of any description, the market which is the most appropriate market for Securities of that description, as determined by the non-Defaulting Party;

(ii) "Deliverable Securities" means Equivalent Securities or Equivalent Margin Securities to be delivered by the Defaulting Party;

(iii) "Net Value" means at any time, in relation to any Deliverable Securities or Receivable Securities, the amount which, in the reasonable opinion of the non-Defaulting Party, represents their fair market value, having regard to such pricing sources (including trading prices) and methods (which may include, without limitation, available prices for Securities with similar maturities, terms and credit characteristics as the relevant Equivalent Securities or Equivalent Margin Securities) as the non-Defaulting Party considers appropriate, less, in the case of Receivable Securities, or plus, in the case of Deliverable Securities, all Transaction Costs which would be incurred or reasonably anticipated in connection with the purchase or sale of such Securities;

(iv) "Receivable Securities" means Equivalent Securities or Equivalent Margin Securities to be delivered to the Defaulting Party; and

(v) "Transaction Costs" in relation to any transaction contemplated in paragraph 10(e) or (f) means the reasonable costs, commissions, fees and expenses (including any mark-up or mark-down or premium paid for guaranteed delivery) incurred or reasonably anticipated in connection with the purchase of Deliverable Securities or sale of Receivable Securities, calculated on the assumption that the aggregate thereof is the least that could reasonably be expected to be paid in order to carry out the transaction.

(f) If -

(i) on or about the Early Termination Date the non-Defaulting Party has sold, in the case of Receivable Securities, or purchased, in the case of Deliverable Securities, Securities which form part of the same issue and are of an identical type and description as those Equivalent Securities or Equivalent Margin Securities (regardless as to whether or not such sales or purchases have settled), the non-Defaulting Party may elect to treat as the Default Market Value -

(A) in the case of Receivable Securities, the net proceeds of such sale after deducting all reasonable costs, commissions, fees and expenses incurred in connection therewith (provided that, where the Securities sold are not identical in amount to the Equivalent Securities or Equivalent Margin Securities, the non-Defaulting Party may, acting in good faith, either (x) elect to treat such net proceeds of sale divided by the amount of Securities sold and multiplied by the amount of the Equivalent Securities or Equivalent Margin Securities as the Default Market Value or (y) elect to treat such net proceeds of sale of the Equivalent Securities or Equivalent Margin Securities actually sold as the Default Market Value of that proportion of the Equivalent Securities or Equivalent Margin Securities, and, in the case of (y), the Default Market Value of the balance of the Equivalent Securities or Equivalent Margin Securities shall be determined separately in accordance with the provisions of this paragraph 10(f)); or

(B) in the case of Deliverable Securities, the aggregate cost of such purchase, including all reasonable costs, commissions, fees and expenses incurred in connection therewith (provided that, where the Securities purchased are not identical in amount to the Equivalent Securities or Equivalent Margin Securities, the non-Defaulting Party may, acting in good faith, either (x) elect to treat such aggregate cost divided by the amount of Securities sold and multiplied by the amount of the Equivalent Securities or Equivalent Margin Securities as the Default Market Value or (y) elect to treat the aggregate cost of purchasing the Equivalent Securities or Equivalent Margin Securities actually purchased as the Default Market Value of that proportion of the Equivalent Securities or Equivalent Margin Securities,

and, in the case of (y), the Default Market Value of the balance of the Equivalent Securities or Equivalent Margin Securities shall be determined separately in accordance with the provisions of this paragraph 10(f));

(ii) on or about the Early Termination Date the non-Defaulting Party has received, in the case of Deliverable Securities, offer quotations or, in the case of Receivable Securities, bid quotations in respect of Securities of the relevant description from two or more market makers or regular dealers in the Appropriate Market in a commercially reasonable size, using pricing methodology which is customary for the relevant type of security (as determined by the non-Defaulting Party) the non-Defaulting Party may elect to treat as the Default Market Value of such Securities -

(A) the price quoted (or where a price is quoted by two or more market makers, the arithmetic mean of such prices) by each of them for, in the case of Deliverable Securities, the sale by the relevant market maker or dealer of such Securities or, in the case of Receivable Securities, the purchase by the relevant market maker or dealer of such Securities provided that such price or prices quoted may be adjusted in a commercially reasonable manner by the non-Defaulting Party (x) to reflect accrued but unpaid coupons not reflected in the price or prices quoted in respect of such securities and (y) in respect of any Pool Factor Affected Security, to reflect the realisable value of such Security, taking into consideration the Pool Factor Distortion (and for this purpose, "Pool Factor Affected Security" means a security other than an equity security in respect of which the decimal value of the outstanding principal divided by the original principal balance of such Security is less than one (as indicated by any pool factor applicable to such security), such circumstance a "Pool Factor Distortion");

(B) after deducting, in the case of Receivable Securities, or adding, in the case of Deliverable Securities the Transaction Costs which would be incurred or reasonably anticipated in connection with such a transaction; or

(iii) if, acting in good faith the non-Defaulting Party either -

(A) has endeavoured but been unable to sell or purchase Securities in accordance with sub-paragraph (i) above or to obtain quotations in accordance with sub-paragraph (ii) above (or both); or

(B) has determined that it would not be commercially reasonable to sell or purchase Securities at the prices bid or offered or to obtain such quotations, or that it would not be commercially reasonable to use any quotations which it has obtained under sub-paragraph (ii) above,

the non-Defaulting Party may determine the Net Value of the relevant Equivalent Securities or Equivalent Margin Securities (which shall be specified) and may treat such Net Value as the Default Market Value of the relevant Equivalent Securities or Equivalent Margin Securities.

(g) The Defaulting Party shall be liable to the non-Defaulting Party for the amount of all reasonable and legal and other professional expenses incurred by the non-Defaulting Party in connection with or as a consequence of an Event of Default, together with interest thereon at the Applicable Rate or, in the case of an expense attributable to a particular Transaction, the Pricing Rate for the relevant Transaction if that Pricing Rate is greater than the Applicable Rate.

(h) If Seller fails to deliver Purchased Securities to Buyer on the applicable Purchase Date Buyer may -

(i) if it has paid the Purchase Price to Seller, require Seller immediately to repay the sum so paid;

(ii) if Buyer has a Transaction Exposure to Seller in respect of the relevant Transaction, require Seller from time to time to pay Cash Margin at least equal to such Transaction Exposure;

(iii) at any time while such failure continues, terminate the Transaction by giving written notice to Seller. On such termination the obligations of Seller and Buyer with respect to delivery of Purchased Securities and Equivalent Securities shall terminate and Seller shall pay to Buyer an amount equal to the excess of the Repurchase Price at the date of Termination over the Purchase Price.

(i) If Buyer fails to deliver some or all Equivalent Securities to Seller on the applicable Repurchase Date Seller may -

(i) if it has paid the Repurchase Price to Buyer, require Buyer immediately to repay the sum so paid;

(ii) if Seller has a Transaction Exposure to Buyer in respect of the relevant Transaction, require Buyer from time to time to pay Cash Margin at least equal to such Transaction Exposure;

(iii) at any time while such failure continues, by written notice to Buyer declare that that Transaction or part of that Transaction corresponding to the Equivalent Securities that have not been delivered (but only that Transaction or part of Transaction) shall be terminated immediately in accordance with sub-paragraph (c) above (disregarding for this purpose references in that sub-paragraph to transfer of Cash Margin, delivery of Equivalent Margin Securities and payment of Cash Equivalent Amount and as if references to the Repurchase Date were to the date on which notice was given under this sub-paragraph).

(j) The provisions of this Agreement constitute a complete statement of the remedies

available to each party in respect of any Event of Default.

(k) Subject to paragraph 10(l), neither party may claim any sum by way of consequential loss or damage in the event of a failure by the other party to perform any of its obligations under this Agreement.

(l) (i) Subject to sub-paragraph (ii) below, if as a result of a Transaction terminating before its agreed Repurchase Date or a Forward Transaction terminating before its Purchase Date under paragraphs 10(b), 10(h)(iii) or 10(i)(iii), the non- Defaulting Party, in the case of paragraph 10(b), Buyer, in the case of paragraph 10(h)(iii), or Seller, in the case of paragraph 10(i)(iii), (in each case the "first party") incurs any loss or expense in entering into replacement transactions or in otherwise hedging its exposure arising in connection with a Transaction so terminating, the other party shall be required to pay to the first party the amount determined by the first party in good faith and without double counting to be equal to the loss or expense incurred in connection with such replacement transactions or hedging (including all fees, costs and other expenses) less the amount of any profit or gain made by that party in connection with such replacement transactions or hedging; provided that if that calculation results in a negative number, an amount equal to that number shall be payable by the first party to the other party.

(ii) If the first party reasonably decides, instead of entering into such replacement transactions, to replace or unwind any hedging transactions which the first party entered into in connection with the Transaction so terminating, or to enter into any replacement hedging transactions, the other party shall be required to pay to the first party the amount determined by the first party in good faith to be equal to the loss or expense incurred in connection with entering into such replacement or unwinding (including all fees, costs and other expenses) less the amount of any profit or gain made by that party in connection with such replacement or unwinding; provided that if that calculation results in a negative number, an amount equal to that number shall be payable by the first party to the other party.

(m) Each party shall immediately notify the other if an Event of Default, or an event which, upon the service of a notice or the lapse of time, or both, would be an Event of Default, occurs in relation to it.

(n) Any amount payable to one party (the Payee) by the other party (the Payer) under paragraph 10(d) may, at the option of the non-Defaulting Party, be reduced by its set off against any amount payable (whether at such time or in the future or upon the occurrence of a contingency) by the Payee to the Payer (irrespective of the currency, place of payment or booking office of the obligation) under any other agreement between the Payee and the Payer or instrument or undertaking issued or executed by one party to, or in favour of, the other party. If an obligation is unascertained, the non- Defaulting Party may in good faith estimate that obligation and set off in respect of the

estimate, subject to accounting to the other party when the obligation is ascertained. Nothing in this paragraph shall be effective to create a charge or other security interest. This paragraph shall be without prejudice and in addition to any right of set off, combination of accounts, lien or other right to which any party is at any time otherwise entitled (whether by operation of law, contract or otherwise).

11. Tax Event

(a) This paragraph shall apply if either party notifies the other that -

(i) any action taken by a taxing authority or brought in a court of competent jurisdiction (regardless of whether such action is taken or brought with respect to a party to this Agreement); or

(ii) a change in the fiscal or regulatory regime (including, but not limited to, a change in law or in the general interpretation of law but excluding any change in any rate of tax),

has or will, in the notifying party's reasonable opinion, have a material adverse effect on that party in the context of a Transaction.

(b) If so requested by the other party, the notifying party will furnish the other with an opinion of a suitably qualified adviser that an event referred to in sub-paragraph (a)(i) or (ii) above has occurred and affects the notifying party.

(c) Where this paragraph applies, the party giving the notice referred to in sub-paragraph (a) may, subject to sub-paragraph (d) below, terminate the Transaction with effect from a date specified in the notice, not being earlier (unless so agreed by the other party) than 30 days after the date of the notice, by nominating that date as the Repurchase Date.

(d) If the party receiving the notice referred to in sub-paragraph (a) so elects, it may override that notice by giving a counter-notice to the other party. If a counter-notice is given, the party which gives the counter-notice will be deemed to have agreed to indemnify the other party against the adverse effect referred to in sub-paragraph (a) so far as relates to the relevant Transaction and the original Repurchase Date will continue to apply.

(e) Where a Transaction is terminated as described in this paragraph, the party which has given the notice to terminate shall indemnify the other party against any reasonable legal and other professional expenses incurred by the other party by reason of the termination, but the other party may not claim any sum by way of consequential loss or damage in respect of a termination in accordance with this paragraph.

(f) This paragraph is without prejudice to paragraph 6(b) (obligation to pay additional amounts if withholding or deduction required); but an obligation to pay such additional amounts may, where appropriate, be a circumstance which causes this paragraph to apply.

12. Interest

To the extent permitted by applicable law, if any sum of money payable hereunder or under any Transaction is not paid when due, interest shall accrue on the unpaid sum as a separate debt at the greater of the Pricing Rate for the Transaction to which such sum relates (where such sum is referable to a Transaction) and Applicable Rate on a 360 day basis or 365 day basis in accordance with the applicable market convention (or as otherwise agreed by the parties), for the actual number of days during the period from and including the date on which payment was due to, but excluding, the date of payment.

13. Single Agreement

Each party acknowledges that, and has entered into this Agreement and will enter into each Transaction hereunder in consideration of and in reliance upon the fact that all Transactions hereunder constitute a single business and contractual relationship and are made in consideration of each other. Accordingly, each party agrees (i) to perform all of its obligations in respect of each Transaction hereunder, and that a default in the performance of any such obligations shall constitute a default by it in respect of all Transactions hereunder, and (ii) that payments, deliveries and other transfers made by either of them in respect of any Transaction shall be deemed to have been made in consideration of payments, deliveries and other transfers in respect of any other Transactions hereunder.

14. Notices and Other Communications

(a) Any notice or other communication to be given under this Agreement -

(i) shall be in the English language, and except where expressly otherwise provided in this Agreement, shall be in writing;

(ii) may be given in any manner described in sub-paragraphs (b) and (c) below;

(iii) shall be sent to the party to whom it is to be given at the address or number, or in accordance with the electronic messaging details, set out in Annex I.

(b) Subject to sub-paragraph (c) below, any such notice or other communication shall be effective -

(i) if in writing and delivered in person or by courier, on the date when it is delivered;

(ii) if sent by facsimile transmission, on the date when the transmission is received by a responsible employee of the recipient in legible form (it being agreed that the burden of proving receipt will be on the sender and will not be met by a transmission report generated by the sender's facsimile machine);

(iii) if sent by certified or registered mail (airmail, if overseas) or the equivalent (return receipt requested), on the date that mail is delivered or its delivery is attempted; or

(iv) if sent by Electronic Messaging System, on the date that electronic message is received;

except that any notice or communication which is received, or delivery of which is attempted, after close of business on the date of receipt or attempted delivery or on a day which is not a day on which commercial banks are open for business in the place where that notice or other communication is to be given shall be treated as given at the opening of business on the next following day which is such a day.

(c) If -

(i) there occurs in relation to either party an Event of Default; and

(ii) the non-Defaulting Party, having made all practicable efforts to do so, including having attempted to use at least two of the methods specified in sub-paragraph (b)(ii), (iii) or (iv) above, has been unable to serve a Default Notice by one of the methods specified in those sub-paragraphs (or such of those methods as are normally used by the non-Defaulting Party when communicating with the Defaulting Party),

the non-Defaulting Party may sign a written notice (a "Special Default Notice") which -

(A) specifies the relevant event referred to in paragraph 10(a) which has occurred in relation to the Defaulting Party;

(B) specifies the Early Termination Date designated in the Default Notice;

(C) states that the non-Defaulting Party, having made all practicable efforts to do so, including having attempted to use at least two of the methods specified in sub-paragraph (b)(ii), (iii) or (iv) above, has been unable to serve a Default Notice by one of the methods specified in those sub- paragraphs (or such of those methods as are normally used by the non-Defaulting Party when communicating with the Defaulting Party); and

(D) specifies the date on which, and the time at which, the Special Default Notice is signed by the non-Defaulting Party.

On the signature of a Special Default Notice the Early Termination Date shall occur as designated in the Default Notice. A Special Default Notice shall be given to the Defaulting Party as soon as practicable after it is signed.

(d) Either party may by notice to the other change the address or facsimile number or Electronic Messaging System details at which notices or other communications are to be given to it.

15. Entire Agreement; Severability

This Agreement shall supersede any existing agreements between the parties containing general terms and conditions for Transactions. Each provision and

agreement herein shall be treated as separate from any other provision or agreement herein and shall be enforceable notwithstanding the unenforceability of any such other provision or agreement.

16. Non-assignability; Termination

(a) Subject to sub-paragraph (b) below, neither party may assign, charge or otherwise deal with (including without limitation any dealing with any interest in or the creation of any interest in) its rights or obligations under this Agreement or under any Transaction without the prior written consent of the other party. Subject to the foregoing, this Agreement and any Transactions shall be binding upon and shall inure to the benefit of the parties and their respective successors and assigns.

(b) Sub-paragraph (a) above shall not preclude a party from assigning, charging or otherwise dealing with all or any part of its interest in any sum payable to it under paragraph 10(c) or (g) above.

(c) Either party may terminate this Agreement by giving written notice to the other, except that this Agreement shall, notwithstanding such notice, remain applicable to any Transactions then outstanding.

(d) All remedies hereunder shall survive Termination in respect of the relevant Transaction and termination of this Agreement.

(e) The participation of any additional member State of the European Union in economic and monetary union after 1 January 1999 shall not have the effect of altering any term of the Agreement or any Transaction, nor give a party the right unilaterally to alter or terminate the Agreement or any Transaction.

17. Governing Law

This Agreement and any non-contractual obligations arising out of or in connection with this Agreement shall be governed by, and interpreted in accordance with, the laws of England.

The English courts shall have exclusive jurisdiction in relation to all disputes (including claims for set-off and counterclaims) arising out of or in connection with this Agreement including, without limitation disputes arising out of or in connection with: (i) the creation, validity, effect, interpretation, performance or non-performance of, or the legal relationships established by, this Agreement; and (ii) any non-contractual obligations arising out of or in connection with this Agreement. For such purposes, Buyer and Seller hereby irrevocably submit to the jurisdiction of the English courts and waive any objection to the exercise of such jurisdiction.

Party A hereby appoints the person identified in Annex I as its agent to receive on its behalf service of process in such courts. If such agent ceases to be its agent, Party A shall promptly appoint, and notify Party B of the identity of, a new agent in England. If

Party A fails to appoint such an agent, Party A agrees that Party B shall be entitled to appoint one on behalf of Party A at the expense of Party A.

Party B hereby appoints the person identified in Annex I as its agent to receive on its behalf service of process in such courts. If such agent ceases to be its agent, Party B shall promptly appoint, and notify Party A of the identity of, a new agent in England. If Party B fails to appoint such an agent, Party B agrees that Party A shall be entitled to appoint one on behalf of Party B at the expense of Party B.

Each party shall deliver to the other, within 30 days of the date of this Agreement in the case of the appointment of a person identified in Annex I or of the date of the appointment of the relevant agent in any other case, evidence of the acceptance by the agent appointed by it pursuant to this paragraph of such appointment.

18. No Waivers, etc.

No express or implied waiver of any Event of Default by either party shall constitute a waiver of any other Event of Default and no exercise of any remedy hereunder by any party shall constitute a waiver of its right to exercise any other remedy hereunder. No modification or waiver of any provision of this Agreement and no consent by any party to a departure herefrom shall be effective unless and until such modification, waiver or consent shall be in writing and duly executed by both of the parties hereto. Without limitation on any of the foregoing, the failure to give a notice pursuant to paragraph 4(a) hereof will not constitute a waiver of any right to do so at a later date.

19. Waiver of Immunity

Each party hereto hereby waives, to the fullest extent permitted by applicable law, all immunity (whether on the basis of sovereignty or otherwise) from jurisdiction, attachment (both before and after judgment) and execution to which it might otherwise be entitled in any action or proceeding in the Courts of England or of any other country or jurisdiction, relating in any way to this Agreement or any Transaction, and agrees that it will not raise, claim or cause to be pleaded any such immunity at or in respect of any such action or proceeding.

20. Recording

The parties agree that each may electronically record all telephone conversations between them.

21. Third Party Rights

No person shall have any right to enforce any provision of this Agreement under the Contracts (Rights of Third Parties) Act 1999.

[Name of Party]

By_____

Title_____

Date_____

[Name of Party]

By_____

Title_____

Date_____

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