

BROTHER, CAN YOU SPARE A DOLLAR? DESIGNING AN EFFECTIVE FRAMEWORK FOR FOREIGN CURRENCY LIQUIDITY ASSISTANCE

Dan Awrey*

The core principles of financial crisis management call upon central banks to lend freely, against good quality collateral, and at a penalty rate of interest, to solvent but illiquid banks and other financial institutions during periods of widespread panic and instability. While often taken for granted, these principles were designed for a world in which central banks have the capacity to create money denominated in the same currency as the one in which domestic banks and other financial institutions issue deposits and other short-term liabilities.

Unfortunately, this is not the world in which we live. The application of these principles is far from straightforward in a world where financial institutions rely on short-term foreign currency liabilities as a source of financing. This is the world of the Eurodollar market. The global financial crisis vividly illustrated the potential systemic risks arising from the exist-

*Associate Professor of Law and Finance and Fellow of Linacre College, University of Oxford. The author would like to thank Weitseng Chen, Christine Desan, Daniela Gabor, Anna Gelpern, Jeff Gordon, Robert Hockett, Rosa Lastra, Saule Omarova, Katharina Pistor, Morgan Ricks, Annelise Riles, Paul Lejot, Matthew Turk, John Vickers, and David Zaring, along with the participants of conferences organized by the Journal of Financial Regulation, the Columbia Center on Global Legal Transformation, the American Society of International Law, the National University of Singapore Centre for Banking and Financial Law, and the University of Sheffield Centre for Corporate and Commercial Law for their extremely helpful comments and suggestions. The author would also like to acknowledge the generous support of the National University of Singapore Centre for Banking and Financial Law. All errors remain my own.

ence of a large Eurodollar market. Faced with a systemic foreign currency liquidity crisis, central banks struggled to secure access to the foreign currency reserves needed to provide emergency liquidity assistance to their domestic banking systems. In response, the U.S. Federal Reserve and other major central banks established a network of swap lines designed to provide foreign currency liquidity assistance to the international financial system.

The central bank swap lines have been hailed as one of the most important and effective policy responses to the financial crisis. However, while it may be tempting to view them as an effective prophylactic against future foreign currency liquidity crises, the current structure of the swap lines fails to establish truly credible international commitments or constrain the moral hazard problems stemming from this ambitious state-sponsored liquidity insurance. This Article examines the unique policy challenges posed by foreign currency liquidity problems, along with how to build a more effective framework for the provision of foreign currency liquidity assistance.

I.	Introduction.....	936
II.	The Origins, Mechanics, and Growth of the Eurodollar Market	948
III.	Financial Crisis Management and the Problem of FCLA	955
	A. The Fundamentals of Emergency Liquidity Assistance	956
	B. The Problem of FCLA.....	968
IV.	The Eurodollar Market and the Financial Crisis.....	972
V.	Designing an Effective Framework for FCLA	985
	A. A Blanket Prohibition Against Eurodollar Liabilities	986
	B. A Global Currency and Central Bank	991
	C. Reform of Existing Institutional Arrangements for FCLA	997
VI.	Conclusion	1015

I. INTRODUCTION

The massive public-sector support for banks and other financial institutions at the height of the global financial crisis has understandably attracted a maelstrom of controversy. One of the most controversial—and yet surprisingly under-scrutinized—aspects of this support was its extension to financial institutions incorporated and licensed to carry on business in other countries.¹ In the United States, eighteen of the twenty-five largest borrowers under the emergency Term Auction Facility (“TAF”) established in December 2007 were European banks.² Foreign banks also ultimately received billions of dollars under Maiden Lane II and III, the vehicles that the Federal Reserve Bank of New York used to provide support to global insurance giant American International Group (“AIG”).³ And perhaps most strikingly, the Federal Reserve (or, the “Fed”) extended over \$USD500 billion at its peak to

¹ See, e.g., Alan Grayson, *Alan Grayson: “Which Foreigners Got the Fed’s \$500,000,000,000?” Bernanke: “I Don’t Know.”*, YOUTUBE (July 21, 2009), <https://www.youtube.com/watch?v=n0NYBTkE1yQ> (showing then Rep. Alan Grayson of Florida questioning then Federal Reserve Board Chairman Ben Bernanke before the House Financial Services Committee on the identity of the foreign financial institutions that received this support). This controversy continued to rage on well after the acute phase of the crisis. See, e.g., Gerald P. O’Driscoll Jr., *The Federal Reserve’s Covert Bailout of Europe*, WALL ST. J. (Dec. 28, 2011), <http://www.wsj.com/articles/SB10001424052970204464404577118682763082876>.

² Efraim Benmelech, *An Empirical Analysis of the Fed’s Term Auction Facility*, 2 CATO PAPERS ON PUB. POL’Y 57, 78–79 (2012). In total, foreign banks received 58% of the total amount of money lent through TAF. *Id.* at 75. For details of borrowing under TAF, see *Term Auction Facility (TAF)*, BD. OF GOVERNORS OF THE FED. RES. SYS., https://www.federalreserve.gov/newsevents/reform_taf.htm [perma.cc/6PJR-43F2].

³ See CONG. OVERSIGHT PANEL, JUNE OVERSIGHT REPORT: THE AIG RESCUE, ITS IMPACT ON MARKETS, AND THE GOVERNMENT’S EXIT STRATEGY 87–94 (2010), <https://www.gpo.gov/fdsys/pkg/CPRT-111JPRT56698/pdf/CPRT-111JPRT56698.pdf> [perma.cc/AC7G-4EKR].

foreign banks and other financial institutions under the auspices of temporary swap lines established with other major central banks.⁴

This extraordinary public support for foreign banks and other financial institutions is often defended as having been necessitated by the high level of integration and interconnectedness within the global financial system. When the United States, Europe, or other major financial centers get a sniffle, the rest of the world stands at risk of catching a cold.⁵ One of the primary drivers of this integration and interconnectedness stems from the dominant role of the U.S. dollar in international trade, finance, and investment.⁶ At the heart of this role is an incredibly important yet relatively obscure corner of the financial system known as the “Eurodollar” market.

We tend to think of money as something over which states enjoy absolute sovereignty.⁷ This thinking reflects the critical

⁴ See *infra* Part IV and Part V for further details regarding the operation of these central bank swap lines and how they were employed during the financial crisis.

⁵ Indeed, this is how the Federal Reserve itself has framed this rationale in various public statements, including a video designed to explain why the central bank swap lines are in the national interest of the United States. See *Protecting the U.S. Economy from Strains Abroad—Why Swap Lines Are in the U.S. National Interest*, FED. RES. BANK N.Y. (Sept. 19, 2017), <https://www.newyorkfed.org/education/liqswap.html>.

⁶ For a good and highly readable description of this role, see generally BARRY EICHENGREEN, *EXORBITANT PRIVILEGE: THE RISE AND FALL OF THE DOLLAR AND THE FUTURE OF THE INTERNATIONAL MONETARY SYSTEM* (2011).

⁷ Indeed, while reasonable scholars can and do disagree about its fundamental nature and importance, there has historically been a remarkable degree of convergence around the view that the *locus* of monetary sovereignty is the state. See Benjamin J. Cohen, *The International Monetary System: Diffusion and Ambiguity*, 84 INT’L AFFAIRS 455, 464 (2008) (“Tradition has long assigned the primary role in monetary governance to the sovereign state.”). This state-centric view has a long and distinguished pedigree in Western political thought. Thomas Hobbes, John Stuart Mill, and Adam Smith each acknowledged the central role of the state in monetary affairs. See THOMAS HOBBS, *LEVIATHAN* 189 (Michael Oakeshott ed., Collier Books 1962) (1651) (“. . . money, of what matter soever coined by the sovereign of a commonwealth, is a sufficient measure of the value of all things else, between the subjects of that commonwealth. By the means of which measure, all commodities, movable and immovable, are made to accompany a man to

role that states play in establishing and maintaining the core legal and economic institutions around which modern monetary systems are built.⁸ States define which instruments qualify as “legal tender”, prescribe what means of payment can be used to pay taxes, and oversee the process of minting coins

all places of his resort, within and without the place of his ordinary residence; and the same passeth from man to man, within the commonwealth; and goes round about, nourishing, as it passeth, every part thereof; in so much as this concoction, is as it were the sanguification of the commonwealth: for natural blood is in like manner made of the fruits of the earth; and circulating, nourisheth by the way every member of the body of man.”); JOHN STUART MILL, *PRINCIPLES OF POLITICAL ECONOMY WITH SOME OF THEIR APPLICATIONS TO SOCIAL PHILOSOPHY* 151 (1848) (“So much of barbarism . . . still remains in the transactions of the most civilized nations, that almost all independent countries choose to assert their nationality by having, to their own inconvenience and that of their neighbours, a peculiar currency of their own.”); ADAM SMITH, *AN INQUIRY INTO THE NATURE AND CAUSES OF THE WEALTH OF NATIONS* 410–11 (Thomas Dobson 1796) (1776) (“A prince, who should enact that a certain proportion of his taxes should be paid in a paper money of a certain kind, might thereby give a certain value to this paper money.”). Benjamin Franklin, meanwhile, viewed the ability of a state to issue its own money as a *prerequisite* of sovereignty. See Pavlina R. Tcherneva, *Money, Power, and Monetary Regimes* 13 (Levy Econ. Inst. of Bard Coll., Working Paper No. 861, 2016) (citing Karl Rhodes, *The Counterfeiting Weapon*, 16 *REGION FOCUS* 34, 34–35 (2012)). For some insight into Franklin’s views on the importance of money to the economic prosperity of the American colonies, see *The Nature and Necessity of a Paper-Currency*, 3 *April 1729*, NAT’L ARCHIVES (last updated June 29, 2017), <http://founders.archives.gov/documents/Franklin/01-01-02-0041> [perma.cc/GTT8-3Y2C]. For more recent treatises reflecting this state-centric view, see ROSA MARÍA LASTRA, *INTERNATIONAL FINANCIAL AND MONETARY LAW* 3–4 (2d ed. 2015); CHARLES PROCTOR, *MANN ON THE LEGAL ASPECT OF MONEY* 500–01 (6th ed. 2005).

⁸ This view is often described as the “chartalist” theory of money. See 1 JOHN MAYNARD KEYNES, *A TREATISE ON MONEY: THE PURE THEORY OF MONEY* 4–7 (reprinted 1953) (1930); GEORG FRIEDRICH KNAPP, *THE STATE THEORY OF MONEY* 31–32 (reprinted 1973) (1924); Abba P. Lerner, *Money as a Creature of the State*, 37 *AM. ECON. REV.* 312 (1947). For a detailed historical study of the role of the state in the development of money and monetary institutions in the United Kingdom, see CHRISTINE DESAN, *MAKING MONEY* (2014). The “chartalist” view of money is often contrasted with the more market-oriented or “metallist” view. See Charles A.E. Goodhart, *The Two Concepts of Money: Implications for the Analysis of Optimal Currency Areas*, 14 *EUR. J. POL. ECON.* 407 (1998).

and printing paper currency. States also establish central banks such as the Federal Reserve and endow them with the power and responsibility to manage the money supply in pursuit of price stability, full employment, and other policy objectives.⁹ Viewed solely from this perspective, states appear to exercise almost complete control over the legal, fiscal, and even physical machinery necessary to create money and ensure its widespread use amongst its citizenry. This state-cen-

⁹ The monetary policy objectives of the Board of Governors of the Federal Reserve System and the Federal Open Market Committee, for example, are to “maintain long run growth of the monetary and credit aggregates commensurate with the economy’s long run potential to increase production, so as to promote effectively the goals of maximum employment, stable prices, and moderate long-term interest rates.” Federal Reserve Act, 12 U.S.C. § 225a (2000). See also LASTRA, *supra* note 7, at 55–63, for a useful introduction to the different objectives central banks pursue.

tric view has long been recognized in common law jurisprudence¹⁰ and as a matter of public international law.¹¹ It is also deeply embedded in the everyday language of money: when we talk about money, we talk about the *U.S.* dollar, *British* pound, and *Icelandic* króna.¹²

¹⁰ As the English Privy Council observed as far back as 1605, money “inheres in the bones of princes.” DESAN, *supra* note 8, at 170 (citing *The Case of Mixed Money* (1605), 118 (“*Monetandi jus principum ossibus inhaeret, Jus monetae comprehenditur in regalibus, quae nunquam a regionis sceptro abdicantur.*”)). Over the centuries, the concept of monetary sovereignty has evolved in response to fundamental changes in the political landscape and the corresponding shift in the identity of the sovereign from absolute monarchs to democratically elected governments. See BENN STEIL & MANUEL HINDS, *MONEY, MARKETS, AND SOVEREIGNTY* 240 (2009) (“The transformation of the concept of sovereignty reflects the evolution over centuries of the dominant system of government from monarchy to democracy, with the mythology of the king as the embodiment of the popular will being substituted for by the elected executive or legislature.”); Claus D. Zimmerman, *The Concept of Monetary Sovereignty Revisited*, 24 EUR. J. INT’L L. 797, 808 (2008) (“At the time when the concept of monetary sovereignty first appeared, in order to support the exercise of the royal prerogative to coin money as exercised by absolutist monarchs, the *locus* of both sovereignty and the power to exercise it might still have been identical, but times have obviously changed. The contemporary mainstream view of states being instruments at the service of their peoples as true holders of sovereignty may be regarded as a corollary of the fundamental idea of popular sovereignty or sovereignty of the people.”) (footnote omitted). Yet despite these profound changes, the concept has retained its state-centric orientation and remains deeply rooted in the “one state, one currency” model that is observed in most of the world today. For a comprehensive overview of this jurisprudence, see PROCTOR, *supra* note 7, at chs. 3–8, 13 (describing, *inter alia*, the private law of monetary obligations, related conflicts of law issues, and the *lex monetae* principle).

¹¹ For a general overview, see PROCTOR, *supra* note 7, at chs. 19–23 (describing various aspects of public international law in relation to money). The recognition in public international law of a state’s sovereignty over its monetary affairs dates at least as far back as a 1929 decision of the Permanent International Court of Justice. *Payment of Various Serbian Loans Issued in France* (Fr. v. Kingdom of the Serbs, Croats, and Slovenes), Judgment, 1929 P.C.I.J. (ser. A) No. 20, at 25 (July 12, 1929) (“It is indeed a generally accepted principle that a State is entitled to regulate its own currency.”).

¹² The euro and, more recently, crypto-currencies, such as bitcoin, are obvious exceptions. While this Article generally uses the terms “country” or

While often far less appreciated, states also play an important role in licensing *private* money creation.¹³ States authorize the establishment of deposit-taking banks and prohibit all firms other than banks from issuing deposit liabilities.¹⁴ States then subject banks to portfolio restrictions, capital and liquidity requirements, and other forms of prudential regulation and intensive prudential supervision.¹⁵ States also provide banks with various forms of support not generally available to other commercial enterprises. This support includes deposit guarantee schemes, emergency liquidity assis-

“state” to describe the political units that issue currencies, these terms should be interpreted as encompassing, *mutatis mutandis*, political units such as the Euro Area that issue “supranational” currencies.

¹³ See generally Robert C. Hockett & Saule T. Omarova, *The Finance Franchise*, 102 CORNELL L. REV. 1143 (2017) (describing the modern financial system as a public-private partnership characterized by the public accommodation and monetization of private liabilities).

¹⁴ The unique privilege bestowed upon banks to issue deposit liabilities is reflected in the legal definition of a “bank” in most jurisdictions. In the European Union, for example, a “credit institution [bank] means an undertaking the business of which is to *take deposits* or other payable funds from the public and to grant credits for its own account . . .” (emphasis added) (internal quotation marks omitted). 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 and Amending Regulation (EU) No 648/2012, art. 4.1(1), 2013 O.J. (L 176) 18. There are several definitions of a “bank” under U.S. law. For example, a bank is defined as “an institution organized under the laws of the United States . . . which both—(i) *accepts demand deposits* or deposits that the depositor may withdraw by check or similar means for payment to third parties or others; and (ii) is engaged in the business of making commercial loans.” U.S. Bank Holding Company Act of 1956, 12 U.S.C. § 1841(2)(c)(1) (2012) (emphasis added). Section 3(a)(2)(A) of the Federal Deposit Insurance Act, in contrast, defines a state bank as “engaged in the business of receiving deposits, other than trust funds” without a corresponding requirement that they also be engaged in the business of making commercial loans. 12 U.S.C. § 1813(a)(2)(A) (2012). These definitions are typically accompanied by entry restrictions prohibiting all firms other than banks from issuing deposit liabilities. See, e.g., 12 U.S.C. § 378(a)(2) (2012).

¹⁵ For a more detailed description of this prudential regulation and supervision, see JOHN ARMOUR ET AL., PRINCIPLES OF FINANCIAL REGULATION chs. 14, 15, 26 (2016).

tance or “lender of last resort” facilities, and special bankruptcy or “resolution” regimes for failing banks.¹⁶ Collectively, this support enhances the credibility of a bank’s commitment to honor its deposit and other short-term liabilities. This credibility is further enhanced by the willingness of the state to accept deposit liabilities in satisfaction of tax and other obligations. The role of the state in licensing, regulating, and supporting banks thus serves to entrench deposit liabilities as close substitutes for coins, paper currency, and other forms of state money. Once again, it is the state—this time in its capacity as the guardian of the conventional banking system—that exercises control over the machinery of money creation.

If only it were so simple. Recent decades have witnessed the gradual erosion of the privileged and mutually beneficial relationship between the state, banks, and private money creation. In retail banking, money market mutual funds have emerged as a substitute for conventional deposit and checking accounts.¹⁷ In commercial and wholesale banking, money market funds, short-term commercial paper, and repurchase (or “repo”) agreements have grown to rival the more traditional savings products offered by banks.¹⁸ Equally important, although again often far less appreciated, banks and other financial institutions incorporated and licensed in one country have increasingly adopted the practice of issuing deposits and other short-term liabilities denominated in the currency of another country. Banks in London offer U.S. dollar deposit ac-

¹⁶ For an in-depth look at this support, see *id.* at chs. 15, 16. For a discussion of how such support enhances the credibility of the commitments underpinning these liabilities, see Anna Gelpern & Erik F. Gerding, *Inside Safe Assets*, 33 YALE J. ON REG. 363 (2016).

¹⁷ For a good summary of the emergence of money market mutual funds as substitutes for bank deposits, see Jonathan Macey, *Reducing Systemic Risk: The Role of Money Market Mutual Funds as Substitutes for Federally Insured Bank Deposits*, 17 STAN. J.L. BUS. & FIN. 131 (2011).

¹⁸ For a description of how and why commercial paper and repurchase agreements serve as substitutes for more traditional banking products, see ARMOUR ET AL., *supra* note 15, ch. 21. For a description of how money market mutual funds serve as substitutes for bank deposits, see Macey, *supra* note 17.

counts; investment banks in Shanghai provide euro denominated trade financing. The unfettered ability of financial institutions to create these short-term foreign currency liabilities with little more than the stroke of a bookkeeper's pen—or a few keys—effectively severs the cord between states and money creation. This is the world of the Eurodollar market.

The Eurodollar market has been around for a very long time. Writing in 1873, the English essayist and father of modern central banking, Walter Bagehot, described the predecessor to the modern Eurodollar market as an important component of London's money market.¹⁹ Yet it is only in the past twenty years or so that this market has blossomed into a multi-trillion dollar behemoth, the health and stability of which has a significant impact on global economic activity and financial stability. The best-known Eurodollar market is the market for U.S. dollar denominated deposits held with foreign banks in countries like the United Kingdom. However, there are also significant Eurodollar markets for commercial paper, repo agreements, derivatives, and trade financing across a range of different countries and currencies.²⁰

The most striking feature of the Eurodollar market is that it revolves around the issuance of short-term liabilities by financial institutions that are not licensed or subject to prudential regulatory oversight in the country that issues the currency in which these liabilities are denominated. Most importantly for the present purposes, these institutions do not enjoy access to the emergency liquidity assistance (“ELA”) facilities provided by the central bank in the country that issues

¹⁹ See WALTER BAGEHOT, *LOMBARD STREET: A DESCRIPTION OF THE MONEY MARKET* 33 (reprinted 1999) (1873) (“Now that London is the clearing-house to foreign countries, London has a new liability to foreign countries. At whatever place many people have to make payments, at that place those people must keep money. A large deposit of foreign money in London is now necessary for the business of the world.”). This nascent Eurodollar market differed from its modern counterpart in one very important respect: instead of national currencies such as the pound or dollar, it was gold bullion that served as the de facto international reserve currency. *Id.* at 44.

²⁰ See *infra* Part II for further details of the origins, basic mechanics, and recent growth of these markets.

the relevant currency. These ELA facilities are an essential tool of financial crisis management: providing collateralized loans to solvent but illiquid banks and other financial institutions in the event that private sources of financing become unavailable.²¹ These facilities are thus often and understandably viewed as the last line of defense against financial panic and instability before states are forced to resort to emergency bailouts. While financial institutions issuing Eurodollar liabilities may have access to the ELA facilities provided by the central bank in their home country, there is no guarantee that this central bank will hold or have access to sufficient reserves of the required foreign currency.²² This leaves these financial institutions heavily reliant on private markets as a source of foreign currency financing. When these markets break down, these institutions run the risk of finding themselves without a port in the middle of a dangerous storm.

This fault line in the global monetary, regulatory, and crisis management architecture leaves the financial institutions that issue Eurodollar liabilities particularly vulnerable to liquidity shocks of the variety experienced during the global financial crisis. Indeed, one of the most pernicious episodes of the financial crisis was the international U.S. dollar liquidity shortage that began in December 2007 and reached its apex in the autumn of 2008.²³ This shortage forced banks and other financial institutions that relied on Eurodollar markets as a

²¹ See *infra* Section III.A for further information regarding the functions and institutional characteristics of these ELA facilities. See also Thomas M. Humphrey, *Lender of Last Resort: The Concept in History*, FED. RES. BANK RICHMOND ECON. REV., Mar./Apr. 1989, at 8, 8. For a brief history of the development of these facilities, see LASTRA, *supra* note 7, at 150–60; Mark A. Carlson & David C. Wheelock, *The Lender of Last Resort: Lessons from the Fed's First 100 Years* (Fed. Res. Bank of St. Louis, Working Paper No. 2012-056B, 2013).

²² Indeed, as described *infra* Section III.B, central banks may incur significant costs in holding these foreign currency reserves. They may also be unable to acquire sufficient quantities of foreign currency on the open market during periods of widespread market disruption.

²³ See *infra* Part IV for a more detailed description of the U.S. dollar liquidity shortage during the financial crisis.

source of financing to either cut back on their U.S. dollar lending activities or sell dollar denominated assets. The shortage thus contributed to the broader contraction of lending and fire sale dynamics that fanned the flames of the crisis.²⁴ Ultimately, it was the desire to extinguish these flames that motivated the Federal Reserve and other central banks to provide such extraordinary support to foreign financial institutions.

This Article examines the two deeply intertwined policy challenges arising from the widespread issuance of Eurodollar liabilities by banks and other financial institutions. The first challenge stems from the prospect of destabilizing cross-border capital flows as foreign currency liquidity is withdrawn from the international financial system during periods of widespread financial instability. The second challenge stems from the significant practical constraints on the ability of central banks to respond to this withdrawal of liquidity by providing financial institutions with ELA denominated in the required foreign currency.²⁵ As this Article will show, these

²⁴ For a more detailed description of these fire sale dynamics and how they played out during the financial crisis, see Markus K. Brunnermeier, *Deciphering the Liquidity and Credit Crunch 2007–2008*, 23 J. ECON. PERSPECTIVES 77 (2009).

²⁵ While not widely acknowledged or studied in the academic literature, at least four scholars have previously *identified* aspects of this problem. See LASTRA, *supra* note 7, at 25 (“The growth in Eurocurrency markets entails a partial loss of monetary sovereignty.”) (footnote omitted); Tullio Treves, *Monetary Sovereignty Today*, in INTERNATIONAL MONETARY LAW: ISSUES FOR THE NEW MILLENNIUM 117 (Mario Giovanoli ed., 2000) (“The lack of the state of the currency’s coercive power [over Eurodollar markets] . . . means that such a state does not have the power effectively to regulate credit in its currency . . .”); Milton Friedman, *The Euro-Dollar Market: Some First Principles*, FED. RES. BANK OF ST. LOUIS R., July 1971, at 16, 17 (“The location of the banks [that issue Eurodollar liabilities] is important primarily because it affects the regulations under which the banks operate and hence the way that they can do business.”); Edward J. Frydl, *The Eurodollar Conundrum*, FED. RES. BANK OF N.Y. Q. REV., Spring 1982, at 11 (“ . . . the Euromarket could in the future become an important snag in monetary control . . .”). However, as this Article will show, even these prescient scholars failed to foresee the challenges posed by a large Eurodollar market in terms of effective financial crisis management.

challenges generate enormous risks for the financial institutions that issue Eurodollar liabilities, for the countries in which these institutions are incorporated and licensed and carry on business, and, ultimately, for global financial stability.

Having framed these important challenges, this Article goes on to examine a range of policy alternatives that might be used to address them. At one end of the spectrum is a blanket prohibition against banks and other financial institutions issuing short-term foreign currency liabilities. At the other end of the spectrum is the creation of a global currency and central bank. In between these extremes reside a number of important but largely incremental reforms to the emerging institutional architecture for the provision of foreign currency liquidity assistance (“FCLA”). This architecture includes the central bank swap lines used to provide U.S. dollar liquidity to foreign banks in the thick of the financial crisis, along with the new and still untested emergency lending facilities recently introduced by the International Monetary Fund (the “IMF”). In the case of the central bank swap lines, these reforms include the introduction of more observable and objective conditions for the provision of FCLA: *ex ante* qualifications for eligible countries, regulatory constraints for eligible financial institutions, and a fee structure that better reflects the role of this liquidity assistance as a form of insurance. In the case of the IMF’s new emergency lending facilities, these reforms include a significant expansion of the available financial resources and the imposition of targeted *ex post* monitoring on countries accessing FCLA. Collectively, these reforms would help constrain the build-up of risk within the Eurodollar market and ameliorate the potential moral hazard problems associated with this state-sponsored liquidity support for private markets and institutions.

This Article makes two distinct contributions to the rapidly expanding literature examining the sources of financial instability and the theory and practice of international financial crisis management. First, it describes the important and varied roles that the modern Eurodollar market plays within the international financial system. While a great deal has already

been written about the Eurodollar market, the preponderance of the existing literature explores questions around its role as a vehicle for regulatory arbitrage and whether its enormous growth contributes to the aggregate money supply and, thus, inflation. With some notable exceptions, this literature also has a tendency to describe the Eurodollar market at a high level of abstraction, thereby contributing to the considerable degree of confusion around what the Eurodollar market is, how it works, and why it is so important. In sharp contrast, this Article provides a more detailed description of the mechanics of various components of the Eurodollar market and examines how they can contribute to financial instability. Second, this Article identifies the challenges that a large Eurodollar market poses in terms of effective international financial crisis management. It then identifies and evaluates the relative merits of various alternatives for how one might go about addressing these challenges with the objective of promoting greater global financial stability.

This Article is organized into six parts. Part II begins by tracing the origins of the Eurodollar market and documenting its tremendous growth in recent decades. It also describes the basic mechanics of this market and the important roles that it plays in supporting international trade, finance, and investment. Part III describes the functions of conventional ELA facilities. It also describes the unique challenges posed by the existence of a large Eurodollar market and the corresponding need for a credible framework for the provision of FCLA. Part IV chronicles the important role of the Eurodollar market in the thick of the global financial crisis, along with the unprecedented measures taken by the Federal Reserve and other major central banks to inject U.S. dollar liquidity into the international financial system. Part V then examines the various ways that one might seek to strengthen this emerging international financial crisis management architecture. Part VI concludes.

II. THE ORIGINS, MECHANICS, AND GROWTH OF THE EURODOLLAR MARKET

The Eurodollar market consists of liabilities—promises to pay—issued by banks and other financial institutions that are denominated in the currency of a country other than the one in which the institution is incorporated and licensed to carry on business.²⁶ These liabilities are issued on a short-term basis, with the issuer typically obligated to deliver the relevant currency on demand, upon the occurrence of a specified contingency, or at the expiry of a fixed period, ranging from overnight up to one year.²⁷ The term “Eurodollar” is derived from the oldest, largest, and arguably best-known segment of this market: the market for U.S. dollar time deposits offered by banks incorporated and licensed in the United Kingdom and Continental Europe.²⁸ In practice, however, the term has long been used more expansively to describe short-term foreign currency liabilities of any denomination issued by financial institutions incorporated and licensed in any country.²⁹

Like many other financial innovations, the emergence and early growth of the modern Eurodollar market in the 1960s and 1970s was the product of regulatory arbitrage.³⁰ The pri-

²⁶ Alexander K. Swoboda, *The Euro-Dollar Market: An Interpretation*, in 64 *ESSAYS IN INT'L FIN.* 1, 1 (1968).

²⁷ The Eurodollar market can be distinguished from the market for longer-term foreign currency liabilities, generally known as the Eurobond market.

²⁸ See generally Ronald I. McKinnon, *The Eurocurrency Market*, in 125 *ESSAYS IN INT'L FIN.* 1, 2 (1977); Swoboda, *supra* note 26, at 1; Friedman, *supra* note 25, at 17.

²⁹ McKinnon, *supra* note 28, at 2.

³⁰ See, e.g., PERRY MEHRLING, *THE NEW LOMBARD STREET: HOW THE FED BECAME THE DEALER OF LAST RESORT* 71–75 (2011) (describing the emergence of parallel loans—the precursor to modern swap markets—in response to capital controls imposed under the Bretton Woods system of fixed exchange rates); Timothy Q. Cook & Jeremy G. Duffield, *Money Market Mutual Funds: A Reaction to Government Regulation or a Lasting Innovation?*, *FED. RES. BANK OF RICHMOND ECON. REV.*, July/Aug. 1979, at 15, 27–29 (describing the emergence of money market funds in response to the constraints imposed under Federal Reserve Regulation Q).

mary impetus for this arbitrage was the impact of U.S. Federal Reserve Regulations D and Q.³¹ Regulation D establishes a minimum fraction of customer deposits that federally licensed banks are required to hold in the form of non-interest bearing central bank reserves.³² These reserve requirements thus impose a constraint on the amount of deposit funding that banks can use to make loans and other investments. Before being phased out in 1986 (and ultimately repealed in 2011), Regulation Q prohibited banks from paying interest on demand deposits and imposed a ceiling on the interest rates that banks were permitted to pay on time deposits and savings deposits.³³

The combined effect of Regulations D and Q was to undermine the competitiveness of U.S. banks in relation to their international peers. Where market interest rates on deposits exceeded the ceiling under Regulation Q—as they did continuously between 1966 and 1986³⁴—depositors could shift their savings to banks in countries such as the United King-

³¹ For early work examining this impact, see McKinnon, *supra* note 28, at 5–10; Friedman, *supra* note 25, at 17–18, 24; Lawrence L. Kreicher, *Eurodollar Arbitrage*, FED. RES. BANK OF N.Y. Q. REV., Summer 1982, at 10. Secondary drivers of this arbitrage were the direct and indirect capital controls imposed under the Bretton Woods monetary and exchange rate framework. McKinnon, *supra* note 28, at 8; Friedman, *supra* note 25, at 17–18. The desire of market participants in some jurisdictions—perhaps most notably the former Soviet Union—to hold U.S. dollars outside the United States in order to avoid potential seizure also likely contributed to early demand for Eurodollar deposits. See PAUL EINZIG, *THE EURO-DOLLAR SYSTEM* 30 (5th ed. 1973).

³² See Reserve Requirements of Depository Institutions (Regulation D), 12 C.F.R. § 204 (2012). Today, Regulation D also applies to “euro-currency” liabilities of federally licensed banks. *Id.*

³³ See Payment of Interest on Demand Deposits, 12 U.S.C. § 371(a) (1979) (repealed 2011). See also 76 Fed. Reg. 42015 (July 18, 2011) (repealing Regulation Q effective July 21, 2011).

³⁴ See R. Alton Gilbert, *Requiem for Regulation Q: What It Did and Why It Passed Away*, FED. RES. BANK OF ST. LOUIS REV., Feb. 1986, at 22, 29.

dom that adopted a more *laissez faire* approach toward interest rates.³⁵ Similarly, insofar as the Fed's reserve requirements were more onerous than those imposed on U.S. dollar deposits in other countries, borrowers in the United States could often lower their cost of capital by borrowing U.S. dollars from foreign banks.³⁶ The extension of these loans would then create new Eurodollar deposits.³⁷ Predictably, the competitive distortions created by these differences in regulatory treatment precipitated a shift in U.S. dollar deposits and loans from banks in the United States to those in the United Kingdom, Europe, and elsewhere.

Given its origins, there is a tendency to view the Eurodollar market purely as a creature of regulatory arbitrage. Today, however, banks and other financial institutions issue Eurodollar liabilities for a variety of different reasons. Many of these reasons reflect the day-to-day needs of commercial firms operating within the global economy. These firms make and receive payments in foreign currencies in the normal course of business. When Apple Inc. purchases camera components from Sony for use in the iPhone 7, for example, it might pay Sony in Japanese yen.³⁸ When Apple then sells the fully as-

³⁵ See McKinnon, *supra* note 28, at 2, 5–10; Friedman, *supra* note 25, at 17–18. See also Catherine R. Schenk, *The Origins of the Eurodollar Market in London: 1955–1963*, 35 EXPLS. IN ECON. HIST. 221 (1998).

³⁶ See Dong He & Robert N. McCauley, *Offshore Markets for the Domestic Currency: Monetary and Financial Stability Issues* 14 (Bank for Int'l Settlements, Working Paper No. 320, 2010) (citing Robert N. McCauley & Rama Seth, *Foreign Bank Credit to U.S. Corporations: The Implications of Offshore Loans*, 17 FED. RES. BANK OF N.Y. Q. REV., Spring 1992, at 52).

³⁷ While the reason for this may not seem immediately obvious to the casual observer, it is sufficient for the present purposes simply to observe that the extension of bank loans typically involves crediting the borrower's account with the bank. In this way, new loans serve to create new deposit liabilities. For a more detailed description, see MICHAEL MCLEAY ET AL., BANK OF ENG., QUARTERLY BULLETIN 2014 Q1: MONEY CREATION IN THE MODERN ECONOMY 14 (2014), <http://www.bankofengland.co.uk/publications/Documents/quarterlybulletin/2014/qb14q1preleasemoneycreation.pdf#page=1> [perma.cc/ZU6A-HZ78]; *supra* Section III.A.

³⁸ Alternatively, of course, Apple can pay Sony in U.S. dollars. Either way, one of the two firms is dealing in a foreign currency.

sembled iPhone at its store in Covent Garden, London, it receives payment in Pound Sterling. As a U.S. firm incorporated and headquartered in California, Apple may then seek to hedge the foreign exchange risk stemming from both its global supply chain and international sales.³⁹ Similarly, the prices of some goods (e.g., crude oil) are only quoted in a single currency (e.g., U.S. dollars), thus necessitating that all prospective purchasers hold reserves of, and all sellers accept payments in, this currency. Understandably, firms that make and receive payments in foreign currencies often look to domestic banks and other financial institutions to provide the commercial accounts, wholesale funding, and risk management services necessary to support their international operations.⁴⁰ For this reason, economic globalization and a robust Eurodollar market are often viewed as going hand in hand.

A second and related reason why banks and other financial institutions issue Eurodollar liabilities is to support international trade. While reliable data is scarce, it has been estimated that approximately half of all international trade is invoiced and settled in U.S. dollars.⁴¹ Understandably, the dominance of the dollar in international trade incentivizes importers and exporters outside the United States to maintain dollar denominated bank accounts in order to accept and make payments in U.S. dollars.⁴² The majority of these accounts are held with banks incorporated and licensed outside

³⁹ As it happens, one of the ways in which Apple in particular hedges the foreign exchange risk stemming from its international sales is to frequently update its domestic prices in response to changes in the exchange rate between the domestic currency and the U.S. dollar. However, most firms do not enjoy this degree of market power and thus rely on financial intermediaries to help them manage their foreign exchange risk.

⁴⁰ Firms may do so for several reasons, ranging from pre-existing relationships, to higher interest rates on domestic deposits, to preferential tax treatment.

⁴¹ Benjamin J. Cohen, *Currency and State Power*, in *BACK TO BASICS: STATE POWER IN A CONTEMPORARY WORLD* 159, 167 (Martha Finnemore & Judith Goldstein eds., 2013). See Linda S. Goldberg & Cédric Tille, *Vehicle Currency Use in International Trade*, *J. INT'L ECON.*, Dec. 2008, at 177, 184–85 (providing a more detailed country-by-country breakdown).

⁴² See Swoboda, *supra* note 26, at 6.

the United States.⁴³ Foreign banks are also an important source of trade financing. One of the most widely used forms of trade financing are letters of credit. Letters of credit represent a commitment by a bank to an exporter (seller) on behalf of an importer (buyer) to make or guarantee payment for goods upon receipt of documentary evidence that they have been delivered. Letters of credit can thus be understood as a form of insurance against the risk of non-payment by the importer. These letters of credit possess two important features for the present purposes. First, most letters of credit are issued on a relatively short-term basis: with maturities typically ranging from seventy to ninety days.⁴⁴ Second, and reflecting the currency composition of international trade more generally, the International Chamber of Commerce estimates that over eighty percent of all letters of credit are denominated in U.S. dollars.⁴⁵

A third reason why financial institutions issue Eurodollar liabilities is to execute what is known as a foreign currency ‘carry trade.’ Foreign currency carry trades seek to exploit differences between the costs of borrowing in one currency relative to the expected return on financial assets denominated in another currency. Thus, for example, a German investment bank might borrow cheaply in Japanese yen and then invest the proceeds in higher-yielding Australian dollar-denominated assets. Where successful, the bank stands to capture the difference—or ‘spread’—between its yen-borrowing costs and its Australian dollar investment returns. Simultaneously, of course, the trade exposes the investment bank to exchange rate volatility and, more specifically, the risk that the yen might appreciate against the Australian dollar over the duration of the trade.⁴⁶ Importantly, the foreign currency borrow-

⁴³ He & McCauley, *supra* note 36, at 2–4.

⁴⁴ See COMMITTEE ON THE GLOBAL FIN. SYS. BANK FOR INT’L SETTLEMENTS, TRADE FINANCE: DEVELOPMENTS AND ISSUES 14 (2014).

⁴⁵ See INT’L CHAMBER OF COMMERCE, 2016 RETHINKING TRADE & FINANCE: AN ICC PRIVATE SECTOR DEVELOPMENT PERSPECTIVE 58 (2016).

⁴⁶ At this point, the bank will either have to rollover its (now more expensive) yen borrowing, or simply repay its yen-denominated liabilities.

ing necessary to execute this trade often takes the form of foreign exchange (or “f/x”) swaps, commercial paper, repo agreements, and other short-term wholesale liabilities.

Finally, banks and other financial institutions create Eurodollar liabilities in the context of their general financing and market-making activities. Many investment banks, for example, borrow funds within f/x swap, foreign currency repo, and other wholesale funding markets in order to raise capital and manage mismatches between the currency composition of their assets and liabilities.⁴⁷ Investment banks also create and market structured finance products, f/x swaps, and other derivatives to their clients.⁴⁸ Structured finance products and derivatives are not typically viewed as creating Eurodollar liabilities. Nevertheless, where these instruments are denominated in a currency not issued by a country in which one or both parties carry on business, they ultimately share a number of important similarities. Most importantly for the present purposes, these instruments typically include state-contingent contractual mechanisms such as variation margin, close-out netting, and novation requirements designed to protect the contracting parties against changes in counterparty credit and market risks.⁴⁹ When these mechanisms are triggered, they require parties to deliver the agreed foreign currency, often within a relatively short time frame.⁵⁰ These ostensibly long-term contracts thus include embedded short-term foreign currency liabilities.

This risk can of course be hedged, but at the expense of the expected profitability of the trade.

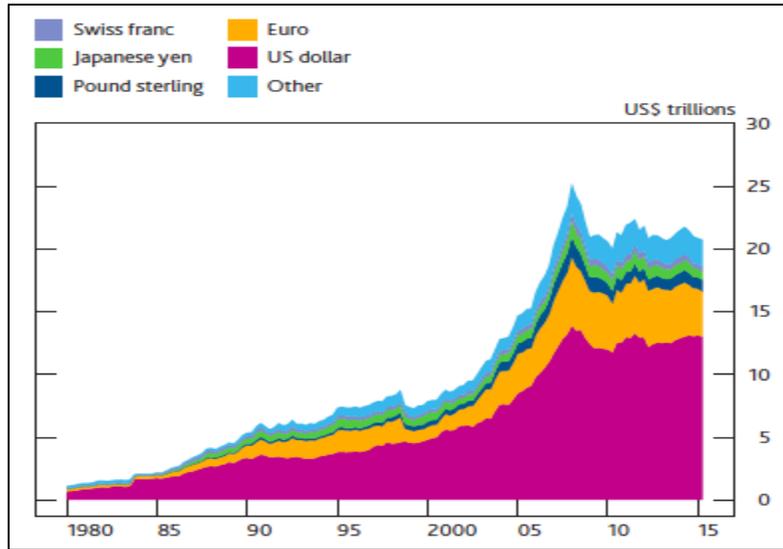
⁴⁷ See ARMOUR ET AL., *supra* note 15, at 452–54.

⁴⁸ See *id.* at 460–65, 468–69.

⁴⁹ See *id.* at 469–72.

⁵⁰ See generally Darrell Duffie, *The Failure Mechanics of Dealer Banks*, 24 J. ECON. PERSP. 51, 55–58 (2010) (describing the vulnerability of dealers to runs by derivatives and repo counterparties and other creditors); Mark J. Roe, *The Derivatives Market’s Payment Priorities as Financial Crisis Accelerator*, 63 STAN. L. REV. 539, 542–43 (2011) (describing the runs by derivatives and repo counterparties on AIG, Bear Stearns, and Lehman Brothers).

FIGURE 1: BANKING SECTOR FOREIGN CURRENCY LIABILITIES (1980–2015)⁵¹



Reflecting their wide range of potential uses in international trade, finance, and investment, the outstanding stock of Eurodollar liabilities has increased significantly over the past several decades. While limitations on available data have long made measuring the size of the Eurodollar market difficult, figures recently released by the Bank for International Settlements (the “BIS”) shed some light on the enormous growth of the global banking system’s foreign currency liabilities between 1980 and 2015 (Figure 1). These figures show foreign currency liabilities peaking at approximately \$USD25 trillion on the eve of the global financial crisis, with more than half of this amount made up of liabilities denominated in U.S. dollars.⁵² To put these figures into perspective, the total stock

⁵¹ EDD DENBEE ET AL, BANK OF ENG., FINANCIAL STABILITY PAPER NO. 36: STITCHING TOGETHER THE GLOBAL FINANCIAL SAFETY NET 6 fig.3 (2016), http://www.bankofengland.co.uk/financialstability/Documents/fpc/fspapers/fs_paper36.pdf [perma.cc/X4DN-PS4A].

⁵² *See id.*

of domestic U.S. dollar deposits held by commercial banks insured by the U.S. Federal Deposit Insurance Corporation (the “FDIC”) was approximately \$USD11.7 trillion at the end of 2016.⁵³

Ultimately, of course, these figures only provide us with an impressionistic sense of the size of the global Eurodollar market. Specifically, insofar as these figures include *longer-term* foreign currency liabilities of banks (and exclude short-term foreign currency liabilities of *non-bank* financial intermediaries and *contingent* foreign currency liabilities embedded within structured finance products and other derivatives), these figures overstate (understate) the true size of this market. Nevertheless, these figures underscore both the important roles that the Eurodollar market plays within the global economic and financial system and its dramatic growth in recent decades.

III. FINANCIAL CRISIS MANAGEMENT AND THE PROBLEM OF FCLA

The growth and importance of the Eurodollar market poses a number of challenges for central banks charged with the responsibility for financial crisis management. As articulated most famously by Walter Bagehot, the core principles of financial crisis management call upon central banks to lend freely, against good quality collateral, and at a penalty rate of interest, to solvent but illiquid banks and other financial institutions during periods of widespread panic and instability.⁵⁴ This prescription, often referred to as “Bagehot’s Dictum,” represents the animating spirit, if not always the strict legal

⁵³ See FED. DEPOSIT INS. CORP., LATEST INDUSTRY TRENDS: STATISTICS AT A GLANCE (2016), <https://www.fdic.gov/bank/statistical/stats/2016dec/industry.pdf> [perma.cc/X4DN-PS4A].

⁵⁴ See BAGEHOT, *supra* note 19, at 21–22. While Bagehot is often credited with having first articulated these principles, that honour largely falls to fellow Englishman Henry Thornton. See *generally* HENRY THORNTON, AN ENQUIRY INTO THE NATURE AND EFFECTS OF THE PAPER CREDIT OF GREAT BRITAIN (F. A. v. Hayek ed., Farrar & Rinehart 1939) (1802).

letter, underpinning the diverse array of institutional arrangements through which central banks provide 'lender of last resort' or ELA facilities.⁵⁵

Historically, the core principles of financial crisis management have been developed and applied predominantly at the domestic level, with national central banks providing ELA to the domestic banking system, denominated in the domestic currency.⁵⁶ As a consequence, these principles have not fully evolved to reflect the emergence and growth of the Eurodollar market. This Part describes these principles. It then identifies the significant practical constraints in applying these principles in a world where banks and other financial institutions rely heavily on the issuance of Eurodollar liabilities and where, accordingly, these institutions are likely to require FCLA during periods of widespread panic and instability.

A. The Fundamentals of Emergency Liquidity Assistance

In order to understand the fundamentals of ELA, one must first understand the peculiar business of banking. The defining feature of banks is that they raise a significant proportion of their capital through the issuance of short-term, liquid liabilities. These liabilities include demand, time, and other types of deposits, along with short-term wholesale borrowing from other banks and financial institutions through the commercial paper and repo markets.⁵⁷ Banks then invest this cap-

⁵⁵ See Xavier Freixas et al., *Lender of Last Resort: A Review of the Literature*, FIN. STABILITY REV. 151 (1999).

⁵⁶ This domestic focus is reflected in the academic and policy literature. See generally *id.* at 158–59, 162. FCLA discussions have often been in extremely vague terms. See Bank for Int'l Settlements, *Statement of Central Bankers*, N.Y. TIMES, Sept. 11, 1974, at 64 (“The governors also had an exchange of views on the problem of the lender of last resort in the Euromarkets. They recognized that it would not be practical to lay down in advance detailed rules and procedures for the provision of temporary liquidity.”).

⁵⁷ The mix of deposits and wholesale funding as a proportion of total bank financing has notably changed over time. A recent study covering sev-

ital in longer term, illiquid loans, mortgages, and other financial assets. In the language of financial economics, banks thus engage in significant levels of credit, liquidity, and maturity transformation by taking the short-term, liquid liabilities owed to depositors and converting them into longer-term, illiquid investments in households, businesses, and governments.⁵⁸

Importantly, the credit, liquidity, and maturity transformation performed by conventional deposit-taking banks involves considerably more than the simple intermediation of savings from depositors to borrowers.⁵⁹ It also represents an important source of private money creation. When a bank makes a loan, the proceeds of the loan are credited to the borrower's bank account.⁶⁰ The extension of a new loan can thus be understood as mechanically resulting in the creation of new deposits.⁶¹ These new deposits can then be used to purchase goods, pay for services, or make investments. In short, these deposits can be used as *money*—money that would not have existed but for the extension of the loan. Rather than merely acting as a conduit for the accumulation and allocation of capital, the business of banking thus necessarily involves a significant level of credit and, ultimately, money creation.⁶² The important role played by banks in creating money is reflected

enteen countries, for example, reports a shift in deposit funding from approximately 80% of total finding following World War II to approximately 50% by the early 2000s. Oscar Jordà et al., *Bank Capital Redux: Solvency, Liquidity, and Crisis* 11–12 (Fed. Reserve Bank of San Francisco, Working Paper No. 2017–06, 2017).

⁵⁸ See ARMOUR ET AL., *supra* note 15, at 277–78 (describing banks as performing credit, maturity, and liquidity transformation).

⁵⁹ See Hockett & Omarova, *supra* note 13, at 1148 (delineating between the 'credit-intermediation,' 'credit-multiplication,' and 'credit-creation' models of finance).

⁶⁰ See generally McLeay et al., *supra* note 37, at 3–5.

⁶¹ See *id.* at 1.

⁶² See *id.* at 2–4.

in the value of outstanding bank deposits relative to other components of the aggregate money supply (Figure 2).⁶³

FIGURE 2: COMPONENTS OF THE U.S. MONEY SUPPLY
(\$USD AS OF MARCH 2017)

Component of Money Supply	Amount (in billions)	Percentage of Total
Currency in circulation	\$1,513,317	9.8%
Reserves ⁶⁴	\$2,314,729	15.0%
Commercial bank deposits ⁶⁵	\$11,594,200	75.2%
TOTAL	\$15,422,246	100%

The business of banking works well so long as large numbers of depositors or other short-term creditors do not demand their money back at the same time.⁶⁶ Where liquidity demands remain uncorrelated, banks need only maintain a small reserve of cash or other highly liquid assets to satisfy

⁶³ See FED. RESERVE SYS., H.3 AGGREGATE RESERVES OF DEPOSITORY INSTITUTIONS AND THE MONETARY BASE (2017), <https://www.federalreserve.gov/releases/h3/current/h3.pdf> [perma.cc/VNB8-VV5Z]; FED. RESERVE SYS., H.8 ASSETS AND LIABILITIES OF COMMERCIAL BANKS IN THE UNITED STATES (2017), <https://www.federalreserve.gov/releases/h8/current/h8.pdf> [perma.cc/LJ47-XEDW]. The Federal Reserve also publishes weekly “Money Stock Measures” (H.6) that report slightly different figures.

⁶⁴ Includes total reserves maintained with the Federal Reserve System and vault cash used to satisfy required reserves. FED. RESERVE SYS., H.3 AGGREGATE RESERVES OF DEPOSITORY INSTITUTIONS AND THE MONETARY BASE (2017), <https://www.federalreserve.gov/releases/h3/current/h3.pdf> [perma.cc/96VC-TQQS].

⁶⁵ The Federal Reserve’s Money Stock Measures report a slightly smaller \$USD11,289,500 billion in demand, time, and other checkable deposits at commercial banks and thrifts as of February 2017. *Id.*

⁶⁶ See Douglas W. Diamond & Philip H. Dybvig, *Bank Runs, Deposit Insurance, and Liquidity*, 91 J. POL’Y ECON. 401, 402 (1983) (describing how the demand deposit system permits efficient risk sharing where depositors demand liquidity at random times). See generally Franklin Allen et al., *Moral Hazard and Government Guarantees in the Banking Industry*, 1 J. FIN. REG. 30 (2015) (providing a recent survey of the literature on the fragility of banks).

idiosyncratic withdrawals.⁶⁷ When combined with the fact that new loans create new deposits, this ‘fractional reserve’ model enables banks to extend a large volume of loans on the foundations of a relatively small deposit base.⁶⁸ By the same token, however, where the liquidity demands of short-term creditors become correlated, the reliance by banks on short-term, liquid liabilities to finance investments in longer term, illiquid assets renders these institutions vulnerable to destabilizing runs by depositors and other short-term creditors.⁶⁹

The fragility of bank balance sheets is typically framed in one of two ways. The first views runs as a multiple equilibrium (or coordination) problem amongst short-term creditors.⁷⁰ Pursuant to this account, each creditor’s decision about whether to run is a function not only of their demand for liquidity and evaluation of the issuer’s creditworthiness, but also—and crucially—their subjective perception of whether *other creditors* are likely run.⁷¹ The second account views runs as a product of the realization by short-term creditors that assets that they previously believed to represent reliable stores of nominal value—or “moneyness”⁷²—are in fact sensitive to the revelation of new information about the creditworthiness of the issuer, the quality of any underlying collateral, or other

⁶⁷ The term “withdrawals” in this context includes the failure to rollover short-term wholesale funding.

⁶⁸ An example may help illustrate this point. Imagine a bank extends a loan of \$100 to a borrower. This loan results in \$100 of new deposits. Assuming a 10% reserve ratio, the bank is able to extend an additional \$90 of loans on the basis of these new deposits. These new loans will then result in \$90 of new deposits, enabling the bank to extend \$USD81 in new loans. This process could theoretically continue *ad infinitum*.

⁶⁹ See Diamond & Dybvig, *supra* note 66, at 402.

⁷⁰ See *id.* at 402–03, 417–18.

⁷¹ See *id.*

⁷² See MILTON FRIEDMAN & ANNA JACOBSON SCHWARTZ, MONETARY STATISTICS OF THE UNITED STATES: ESTIMATES, SOURCES, METHODS, 151–52 (1970); J. R. HICKS, VALUE AND CAPITAL, 163 (2nd ed., Clarendon Press 1946) (1939).

variables.⁷³ Pursuant to this second account, rather than investing the time and energy necessary to incorporate this new information into the price of these assets, creditors may simply prefer to shift to less informationally-sensitive substitutes that, in effect, possess a higher degree of moneyness.⁷⁴

Where the liquidity demands of depositors and other short-term creditors exceed available reserves, banks are left with two possible options. The first is to seek funding from other financial institutions within wholesale funding markets. The availability of this option will depend on market perceptions of the borrower's solvency,⁷⁵ along with whether or not prospective lenders within this market are themselves facing—or anticipate facing—similar liquidity problems.⁷⁶ The second option is to sell loans or other financial assets and to use the proceeds to satisfy the bank's obligations to short-term creditors. Crucially, however, where banks are forced to sell longer-term, opaque, and illiquid assets within a short time frame, this will reduce the probability that these institutions will be able to sell these assets at full market value. As a result, banks may be forced to accept losses on long-term assets in order to honor their liabilities to short-term creditors.

⁷³ See generally GARY B. GORTON, *SLAPPED BY THE INVISIBLE HAND: THE PANIC OF 2007* (2010); Bengt Holmstrom, *Understanding the Role of Debt in the Financial System* (Bank of Int'l Settlements, Working Paper No. 479, Jan. 2015), <https://www.bis.org/publ/work479.pdf> [perma.cc/H44L-C4PV]. The key difference between this account and multiple equilibrium views of run-like behavior is the absence of a coordination problem, i.e., creditors in this second account do not switch in anticipation of the decisions of other creditors.

⁷⁴ See generally GORTON, *supra* note 73; Holmstrom, *supra* note 73.

⁷⁵ See Freixas et al., *supra* note 55, at 153.

⁷⁶ See Mark J. Flannery, *Financial Crises, Payment System Problems, and Discount Window Lending*, 28 J. MONEY, CREDIT & BANKING 804, 805–06 (1996) (suggesting that banks may become more reluctant to lend in the wholesale market during periods of crisis); Xavier Freixas et al., *Systemic Risk, Interbank Relations, and Liquidity Provision by the Central Bank*, 32 J. OF MONEY, CREDIT & BANKING 611, 611, 613 (2000) (presenting a model in which banks are reluctant to lend in the wholesale market owing to uncertainty about their own ability to borrow in the market in the future).

Through this channel, what began as a short-term liquidity problem can quickly evolve into a full-blown solvency problem.

However one elects to frame the source of this fragility, the destabilizing run-like behavior at the heart of bank runs can escalate into more generalized panics characterized by the widespread withdrawal of financing by short-term creditors and a resulting “scramble for high-powered money.”⁷⁷ These generalized panics can be understood as throwing the fractional reserve model into reverse: with the flight of short-term creditors reducing the deposit base and precipitating fire sales of loans and other assets, and the sale of loans mechanically resulting in further reductions in the deposit base.⁷⁸ Morgan Ricks has characterized this relationship among runs, financial panics, and private money creation as “the money problem”⁷⁹ and views it as “far and away the biggest threat the financial system poses to the broader economy.”⁸⁰

At the core of this problem is the contraction in the supply of privately created money during financial panics and the resulting impact on the real economy.⁸¹ These contractions force financial institutions that rely on short-term funding to sell

⁷⁷ Anna J. Schwartz, *Real and Pseudo-Financial Crises*, in MONEY IN HISTORICAL PERSPECTIVE 271 (1987).

⁷⁸ Although at a systemic level, the reduction in deposits will only serve to reduce the aggregate money supply where the withdrawn funds flow out of the conventional banking system. See George G. Kaufman, *Lender of Last Resort: A Contemporary Perspective*, in FINANCIAL CRISES, CONTAGION, AND THE LENDER OF LAST RESORT 169, 174 (Charles Goodhart & Gerhard Illing eds., 2002).

⁷⁹ MORGAN RICKS, *THE MONEY PROBLEM: RETHINKING FINANCIAL REGULATION* (2016).

⁸⁰ *Id.* at 103.

⁸¹ In this respect, Ricks draws on Friedman and Schwartz’s analysis of the monetary causes of the Great Depression. See generally MILTON FRIEDMAN & ANNA JACOBSON SCHWARTZ, *A MONETARY HISTORY OF THE UNITED STATES, 1867–1960* (1971). Ricks also relies on the empirical evidence of Victoria Ivashina and David Scharfstein relating to the financial crisis of 2007–09. See Victoria Ivashina & David Scharfstein, *Bank Lending During the Financial Crisis of 2008*, 97 J. FIN. ECON. 319 (2010).

assets in order to cover their short-term liabilities.⁸² The resulting fire sales lead to a fall in asset prices and a corresponding increase in the yields on these assets. The increase in yields then changes the opportunity cost calculus for financial institutions looking to make new investments—precipitating an increase in borrowing costs for households, businesses, and governments, and a corresponding decrease in levels of investment and economic activity.⁸³ Viewed from this perspective, panics drive contractions in the money supply, which in turn threaten to drive contractions in economic growth.

It is against the backdrop of this threat that the functions of state support for the conventional banking system can be most clearly understood.⁸⁴ The first—*microprudential*—function is to reduce the risk of idiosyncratic bank runs.⁸⁵ The second—*macroprudential*—function is to prevent bank runs and other shocks from escalating into more widespread panics and, ultimately, contractions in the money supply and economic growth.⁸⁶ While early writers such as Bagehot and Henry Thornton arguably viewed ELA as performing solely a macroprudential function, more recent observers have emphasized the largely complementary relationship between these two functions insofar as the failure to support individual institutions can, in some cases, precipitate more widespread panic and financial instability.⁸⁷

⁸² RICKS, *supra* note 79, at 110.

⁸³ *See id.* at 110–11.

⁸⁴ Although, as Thomas M. Humphrey and Robert E. Keleher have observed, these functions are rarely spelled out, leading to significantly divergent understandings in practice. Thomas M. Humphrey & Robert E. Keleher, *The Lender of Last Resort: A Historical Perspective*, in FINANCIAL CRISES, CONTAGION, AND THE LENDER OF LAST RESORT 73 (2002).

⁸⁵ *See* Freixas et al., *supra* note 55.

⁸⁶ *See* Freixas et al., *supra* note 55, at 153; Humphrey, *supra* note 21, at 8–9; Humphrey & Keleher, *supra* note 84, at 74–75; Kaufman, *supra* note 78, at 173–74.

⁸⁷ In effect, this second perspective reflects the idea that some financial institutions are “too big to fail” in the sense that their failure is expected to trigger more widespread panic and market disruption. *See* Freixas et al., *supra* note 55, at 152; Kaufman, *supra* note 78, at 169. *See generally* Marvin Goodfriend & Robert G. King, *Financial Deregulation, Monetary Policy, and*

There are two basic ways that the state can perform these functions. The first is deposit insurance. While deposit insurance schemes vary across jurisdictions, the basic strategy is to have a third-party guarantee depositors' funds in the event of bank failure. This third party effectively steps into the shoes of the bank: honoring the bank's commitments to depositors during periods of institutional distress.⁸⁸ In order to make this commitment credible, the government typically provides this third-party guarantee through institutions such as the FDIC. The introduction of deposit insurance beginning in the United States in the 1930's is often credited with having significantly enhanced the level of consumer protection enjoyed by bank depositors.⁸⁹ However, insofar as these schemes generally only protect a subset of a bank's short-term creditors—typically retail depositors with accounts below a specified threshold—it is at best an incomplete strategy for counterbalancing the inherent fragility of bank balance sheets.

The second, far older, and far broader strategy is ELA. Distilled to its essence, ELA is “the *discretionary* provision of liquidity to a financial institution (or the market as a whole) by the central bank in reaction to an adverse shock which causes an abnormal increase in demand for liquidity which cannot be met by an alternative source.”⁹⁰ In effect, ELA is designed to pump money into the financial system, thereby offsetting any contraction in the private money supply and signaling to depositors and other short-term creditors that the central bank will provide whatever support is necessary in order to restore market confidence and financial stability. This liquidity typi-

Central Banking, in RESTRUCTURING BANKING & FINANCIAL SERVICES IN AMERICA 216 (William S. Haraf & Rose Marie Kushmeider eds., 1988).

⁸⁸ The third party then steps into the shoes of the depositors in order to seek redress from the estate of the bank.

⁸⁹ See, e.g., Andrew Campbell & Peter Cartwright, *Deposit Insurance: Consumer Protection, Bank Safety and Moral Hazard*, 10 EUR. BUS. L. REV. 96, 96–97, 99 (1999) (describing the competing views of deposit insurance as a mechanism for either protecting consumers or minimizing the risk of bank runs).

⁹⁰ Freixas et al., *supra* note 55, at 152.

cally takes the form of short-term loans to banks or other financial institutions experiencing temporary liquidity problems. These loans are fully secured by a pledge of eligible collateral assets by the financial institutions receiving ELA. Eligible collateral assets generally include commercial loans, residential and commercial mortgages, government securities, investment grade bonds, asset-backed securities, and other fixed income instruments. These collateral assets are then subject to a discount—or “haircut”—designed to protect the central bank against any decrease in their market value.⁹¹

The institutional frameworks through which central banks provide ELA vary from jurisdiction to jurisdiction. In the United States, the Federal Reserve has historically provided ELA to eligible member banks through its discount window, a standing collateralized loan facility.⁹² Pursuant to section 13(3) of the Federal Reserve Act, the Fed can also extend ELA to non-bank financial institutions under certain conditions in the event of “unusual and exigent circumstances.”⁹³ In the

⁹¹ This discount takes the form of a decrease in the amount of the loan that can be secured against any given collateral asset.

⁹² For the framework implementing the Federal Reserve’s discount window, see generally *Extensions of Credit by Federal Reserve Banks* (Regulation A), 12 C.F.R. § 201 (2017). See also *FED. RES. DISCOUNT WINDOW*, <https://www.frbdiscountwindow.org/> (Oct. 15, 2017) [perma.cc/K2AR-GRM9]. The Fed can also extend ELA through its open market operations (i.e., the purchase and sale of securities on the open market). Kaufman, *supra* note 78, at 180–81. For a discussion of the conceptual problems of conflating ELA with open market operations, see generally Charles Goodhart, *Myths About the Lender of Last Resort*, in *FINANCIAL CRISES, CONTAGION, AND THE LENDER OF LAST RESORT* 227, 231 (Charles Goodhart & Gerhard Illing eds., 2002).

⁹³ Federal Reserve Act, 12 U.S.C. § 343 (2010). The provision of ELA under section 13(3) must be pursuant to a program or facility with “broad-based” eligibility, thereby prohibiting ad hoc support to individual institutions. Unlike discount window lending, institutions in receipt of ELA under section 13(3) must also demonstrate that they cannot secure credit accommodation from other financial institutions. As Kathryn Judge observes, there are also a number of other government facilities that can be viewed as performing a similar function. Kathryn Judge, *Three Discount Windows*, 99 *CORNELL L. REV.* 795 (2014) (describing, for example, the operations of

United Kingdom, meanwhile, the Bank of England operates its discount window, ELA, and other liquidity facilities under separate frameworks, each of which are available to banks, building societies, securities dealers, and central counterparties.⁹⁴

Predictably, the strategy of having central banks pump money into the financial system—to “lend freely” in Bagehot’s terms—gives rise to potentially significant moral hazard problems.⁹⁵ Specifically, where banks and other financial institutions anticipate that they will receive ELA, this may incentivize them to rely more heavily on short-term liabilities or invest in more risky and illiquid assets. The other components of Bagehot’s dictum can each be understood as designed to constrain this problem.⁹⁶ The requirement that central banks lend only against good quality collateral, for example, limits the ability of banks to invest in risky and illiquid assets while still retaining a sufficient portfolio of eligible collateral that they can pledge for the purposes of obtaining ELA.⁹⁷ For the same reason, the fact that a bank is able to pledge good quality

the Federal Home Loan Bank in providing support to banks during the financial crisis).

⁹⁴ For a detailed description of the discount window and contingent term repo facilities, see generally BANK OF ENG., THE BANK OF ENGLAND’S STERLING MONETARY FRAMEWORK (2015). ELA is provided under a separate, largely unpublished, framework and can be provided to any entity (including but not limited to financial institutions). The Bank also administers an index long-term repo facility designed for institutions with predictable needs for liquid assets.

⁹⁵ Once again, Henry Thornton seems to have been the first observer to remark on this problem. THORNTON, *supra* note 54, at 188.

⁹⁶ Ultimately, the capital, liquidity, and other forms of prudential regulation and intensive prudential supervision to which banks are subject also play important roles in constraining potential moral hazard problems. For a description of this regulation and supervision, see ARMOUR ET AL., *supra* note 15, at chs. 14–16.

⁹⁷ This requirement also serves to insulate central banks from counterparty credit risk, along with any market risk stemming from volatility in the price of pledged collateral.

collateral serves as a credible signal of its solvency.⁹⁸ The requirement to lend at a penalty rate of interest, meanwhile, deters banks from relying on ELA where private market-based sources of short-term financing are available.⁹⁹ Finally, as banks and other financial institutions approach insolvency, they have a natural incentive to take on more risk. The requirement that ELA be extended only to financial institutions experiencing temporary liquidity problems thus ensures that fundamentally insolvent institutions do not use it in an attempt to gamble for resurrection. Ultimately, while it is debatable whether Bagehot's dictum is always observed in practice¹⁰⁰—and while it may be a challenge to calibrate penalty interest rates, define what constitutes good quality collateral, and distinguish between illiquid and insolvent institutions¹⁰¹—the components of this dictum coalesce to provide a relatively coherent framework for understanding when and how central banks should provide ELA to banks and other financial institutions.

Over the past decade, the effectiveness of conventional ELA frameworks in many jurisdictions has been tested by the emergence and growth of the so-called “shadow” banking system¹⁰²: non-bank financial intermediaries that perform credit, liquidity, and maturity transformation without explicit access

⁹⁸ Stanley Fischer, *On the Need for an International Lender of Last Resort*, 13 J. ECON. PERSP. 85, 90 (1999).

⁹⁹ It also gives banks receiving ELA a strong incentive to pay back the loans as soon as possible.

¹⁰⁰ Michael D. Bordo, for example, points out several instances where it appears Bagehot's dictum was not strictly observed, including the bailouts of Franklin National (1974), First Pennsylvania (1980), Continental Illinois (1984), and Johnson Matthey Bankers (1982). Michael D. Bordo, *The Lender of Last Resort: Alternative Views and Historical Experience*, in FINANCIAL CRISES, CONTAGION, AND THE LENDER OF LAST RESORT 109, 122 (Charles Goodhart & Gerhard Illing eds., 2002).

¹⁰¹ For a discussion of these challenges, see Goodhart, *supra* note 92, at 229–34; Kaufman, *supra* note 78, at 178–81.

¹⁰² RICKS, *supra* note 79, at 160–63, 200–19.

to ELA facilities or other forms of state support.¹⁰³ During the global financial crisis of 2007–09, for example, the Federal Reserve extended a relatively small proportion of its emergency lending through its discount window.¹⁰⁴ Instead, the Fed was forced to introduce several new emergency lending facilities designed to provide liquidity support to securities dealers, money market mutual funds, and the tri-party repo, asset-backed security, and asset-backed commercial paper markets.¹⁰⁵ It also introduced bespoke facilities designed to provide support to systemically important institutions such as Bear Stearns, AIG, Citigroup, and Bank of America.¹⁰⁶ Importantly, conventional ELA frameworks were also exposed by the crisis as not fit for purpose in a globally integrated and interconnected financial system in which many banks and other financial institutions required access to FCLA during periods of widespread panic and financial instability.

¹⁰³ See Zoltan Pozsar et al., *Shadow Banking*, FED. RES. BANK N.Y. ECON. POL'Y REV., Dec. 2013, at 1 (defining shadow banks as non-bank financial intermediaries that perform credit, liquidity, and maturity transformation outside the regulated banking system).

¹⁰⁴ See Stephen G. Cecchetti, *Crisis and Responses: The Federal Reserve in the Early Stages of the Financial Crisis*, 23 J. ECON. PERSP. 51, 55 (2009) (reporting average borrowing through the discount window of approximately one billion dollars during the first seven months of the financial crisis).

¹⁰⁵ These facilities included the Term Securities Lending Facility and Primary Dealer Credit Facility (designed to support securities dealers); the Asset-Backed Commercial Paper Money Market Mutual Fund Facility, Commercial Paper Funding Facility, and Money Market Investor Funding Facility (designed to support money market mutual funds and the asset-backed commercial paper market); and the Term Asset-Backed Securities Loan Facility (designed to support the asset-backed security market). See also Judge, *supra* note 93 (describing the operations of the Federal Home Loan Bank in providing support to banks during the financial crisis).

¹⁰⁶ For an overview of these facilities, see Dietrich Domanski et al., *Central Banks as Lender of Last Resort: Experiences During the 2007–2010 Crisis and Lessons for the Future* 6–9 (Fed. Reserve Bd., Washington, DC, Divs. of Research & Statistics and Monetary Affairs, Fin. and Econ. Discussion Series No. 2014-110, 2014).

B. The Problem of FCLA

The core principles of financial crisis management envision that the central banks responsible for providing ELA will possess several key attributes. The first and most important attribute is the capacity to issue an unlimited stock of liabilities that are universally accepted as a form of money within the domestic economy.¹⁰⁷ The defining feature of the Federal Reserve is that it can print U.S. dollars, the Bank of England that it can print Pound Sterling. These central bank liabilities are implicitly backed by the government's authority to raise and collect taxes, and to dictate that these taxes be paid in the domestic currency. Second, central banks must have the legal authority to use these central bank liabilities to extend loans or purchase assets denominated in the domestic currency for the purpose of providing ELA. Third, central banks must have operational frameworks in place that enable them to extend ELA extremely rapidly—typically within a matter of days, if not hours, from the moment at which it has been determined that ELA is necessary in order to maintain or restore financial stability.

These key attributes highlight the fact that conventional ELA frameworks are designed to provide liquidity support to banks and other financial institutions that raise capital and make investments denominated in the domestic currency. But what about financial institutions that raise capital and make investments in *foreign* currencies? In short: what about the Eurodollar market? Where financial institutions that rely heavily on the Eurodollar market as a source of financing also perform significant levels of credit, liquidity, and maturity transformation, these institutions will be susceptible to destabilizing runs by depositors and other short-term creditors. As we have seen, these runs can escalate into broader contractions in the money supply within the domestic financial system. The key difference in this case is that these runs will take

¹⁰⁷ Anna J. Schwartz, *Earmarks of a Lender of Last Resort*, in FINANCIAL CRISES, CONTAGION, AND THE LENDER OF LAST RESORT 449, 454–55 (Charles Goodhart & Gerhard Illing eds., 2002).

place in foreign currency.¹⁰⁸ This fairly benign observation exposes the fundamental problem of FCLA: central banks only have the capacity to print money denominated in their own currency. The Bank of England cannot print new U.S. dollars any more than the Federal Reserve can print Pound Sterling.¹⁰⁹ Nor can these central banks force foreign currency creditors to accept payment in the domestic currency.¹¹⁰ Accordingly, where financial institutions rely extensively on short-term foreign currency financing, central banks will lack the ability to create the critical resource needed to provide ELA to the domestic financial system.

There are several ways that central banks can theoretically secure access to foreign currency for the purpose of providing FCLA. The first option is to accumulate foreign currency reserves in denominations and amounts that reflect the composition of the domestic financial system's short-term foreign currency liabilities. This option is essentially a form of self-insurance against the prospect of eventually having to provide FCLA. However, while this option may seem relatively straightforward, it is also potentially costly and distortive. As a preliminary matter, central banks pursuing this option will be exposed to fluctuations in the exchange rate between the domestic and foreign currencies.¹¹¹ In order to limit the effects of accumulating foreign reserves on the domestic money supply, central banks may also need to undertake so-called "sterilization" measures: for example, selling government securities in order to neutralize the monetary impact of using domestic currency to purchase the required foreign currency.¹¹² These sterilization measures will be costly

¹⁰⁸ See Roberto Chang & Andrés Velasco, *The Asian Liquidity Crisis* (Nat'l Bureau of Econ. Research, Working Paper No. 6796, 1998) (describing this problem in the context of the Asian liquidity crisis of 1997–98).

¹⁰⁹ See Goodhart, *supra* note 92, at 235.

¹¹⁰ At least where this is not explicitly contemplated by the relevant contracts. *See id.*

¹¹¹ Denbee et al., *supra* note 51, at 9.

¹¹² *Id.* The monetary effects of accumulating foreign exchange reserves stem from the fact that these reserves need to be purchased with domestic

where the yields on the government securities exceed the yield on the central bank's foreign reserve holdings.¹¹³ More broadly, where a significant number of central banks simultaneously pursue the option of accumulating foreign currency reserves, the resulting increase in demand for reserve currencies such as the U.S. dollar may compress yields, thereby distorting prices and potentially driving a search for yield among investors.¹¹⁴

The second option is to negotiate an *ex ante* contractual right to borrow foreign currency in the event that it is required in order to provide FCLA. The central bank of Argentina, for example, has reportedly entered a series of repo agreements with a syndicate of international banks enabling it to swap government securities and other collateral in exchange for U.S. dollars.¹¹⁵ Once again, however, this is likely to be an extremely costly option as the borrower pays a fee for the option itself, along with interest on any borrowed funds.¹¹⁶ The borrower would also be exposed to the risk that the U.S. dollar might appreciate over the term of the agreement. More importantly, this option would only be as effective as the lender's ability to acquire sufficient foreign currency to meet its obligations under the type of distressed market conditions in which the borrowing central bank would be required to provide FCLA.

currency, thereby increasing the aggregate money supply. Selling government securities in exchange for domestic currency can thus be used to offset this increase.

¹¹³ *Id.*

¹¹⁴ *Id.*

¹¹⁵ Schwartz, *supra* note 107, at 457. See also Carolina Millan & Katia Porzecanski, *Argentina Agrees to Borrow \$5 Billion from Wall Street Banks*, BLOOMBERG (Jan. 29, 2016, 3:45 PM), <https://www.bloomberg.com/news/articles/2016-01-29/argentina-agrees-to-5-billion-of-loans-from-wall-street-banks>.

¹¹⁶ Schwartz reports that, under one such agreement entered into in 1996, the Central Bank of Argentina was required to pay a thirty-three basis point (0.33%) insurance premium plus an interest rate on borrowed funds of LIBOR, 205 basis points (2.05%). Schwartz, *supra* note 107, at 457. Borrowing costs will, of course, vary with both the currency in question and the creditworthiness of the borrower.

The third option is to purchase foreign currency on the open market at the point in time at which it is actually needed to provide FCLA. This option may be expedient and cost effective where central banks require foreign currency in order to provide FCLA in response to idiosyncratic liquidity problems or other localized shocks. However, where the catalyst for the provision of FCLA is a more systemic shock—especially one characterized by the breakdown of international wholesale funding and foreign currency markets—central banks may be left without a reliable private source of foreign currency liquidity. Under these circumstances, central banks that have neglected to secure some form of *ex ante* (self-)insurance will have no other option but to seek liquidity support from the central bank that prints the relevant currency. Central banks that pursue this option will thus find themselves in the vulnerable position of having to ask foreign policymakers for a garden hose whenever their own house catches fire. As we shall see in Part IV, this is precisely the position in which many central banks found themselves in the thick of the global financial crisis.

The extension of foreign currency loans from one central bank to another for purposes of providing FCLA poses a host of technical challenges. How can the central bank lending the relevant currency ensure that the borrowing central bank only provides FCLA against good quality collateral, at a penalty rate of interest, and to solvent but illiquid banks and other financial institutions? What forms of collateral should the lender itself take against the obligations of the borrower? How should it calculate any *ex ante* insurance premium, along with the rate of interest on borrowed funds? Should there be limits on the amount that central banks can borrow? And perhaps most importantly, what mechanisms can be used to make the commitments of both the lender and borrower as credible as possible? The answers to these questions will understandably have an impact on both the effectiveness of FCLA and the extent to which it gives rise to potential moral hazard problems.

Until relatively recently, the challenges of providing FCLA were largely theoretical. Where FCLA was provided, it was extended almost exclusively on an *ad hoc* basis in response to

localized foreign currency liquidity shocks.¹¹⁷ Over the course of the past several decades, however, the emergence and growth of the Eurodollar market has dramatically increased the risk of more systemic foreign currency liquidity problems and, with them, the need for an effective framework for the provision of FCLA. Just how urgently this framework was required would be exposed by the tumultuous events of 2007–2009.

IV. THE EURODOLLAR MARKET AND THE FINANCIAL CRISIS

The global financial crisis of 2007–2009 vividly illustrated the potential systemic risks arising from the existence of a large Eurodollar market.¹¹⁸ Between 2000 and 2007, the boom in U.S. real estate markets, the demand for ‘safe’ assets such as U.S. treasury securities, and the globalization of banking and institutional asset management combined with other factors to spur demand for U.S. dollar-denominated financial assets by foreign banks and other financial institutions.¹¹⁹ The BIS estimates that the outstanding stock of foreign claims held by banks grew by roughly three times during this period: from approximately \$USD11 trillion at the end of 2000 to

¹¹⁷ For example, the \$USD6 billion swap line extended by the United States to Mexico in March 1994 in order to stabilize the peso following the assassination of presidential candidate Luis Donaldo Colosio. See MICHAEL D. BORDO ET AL., STRAINED RELATIONS: U.S. FOREIGN EXCHANGE OPERATIONS AND MONETARY POLICY IN THE TWENTIETH CENTURY 327 (2015).

¹¹⁸ For one of the first legal accounts of this aspect of the financial crisis and the response of the Federal Reserve, see Colleen Baker, *The Federal Reserve’s Use of International Swap Lines*, 55 ARIZ. L. REV. 603 (2013).

¹¹⁹ See Patrick McGuire & Goetz von Peter, *The US Dollar Shortage in Global Banking*, BIS Q. REV., Mar. 2009, at 47; Ben S. Bernanke et al., *International Capital Flows and the Returns to Safe Assets in the United States, 2003–2007* (Bd. of Governors of the Fed. Res., Int’l Fin Discussion Papers, No. 1014, 2011); Naohiko Baba et al., *US Dollar Money Market Funds and Non-US Banks*, BIS Q. REV., Mar. 2009, at 65.

\$USD31 trillion by the summer of 2007.¹²⁰ A significant proportion of these claims were denominated in foreign currencies.¹²¹

Many of the foreign banks and other financial institutions that purchased U.S. dollar-denominated assets financed them using one or a combination of U.S. dollar deposits, overnight repo, and short-term commercial paper.¹²² Many institutions also relied on *f/x* swap markets to convert their domestic currency holdings into U.S. dollars.¹²³ As a result, the longer term U.S. dollar-denominated assets held by foreign banks and other financial institutions were often supported by very short-term liabilities that, in effect, required these institutions to rollover their U.S. dollar funding on a more or less continuous basis.¹²⁴ This funding model gave rise to an acute form of funding (or ‘rollover’) risk: the risk that the amount of new short-term dollar funding that these institutions would be able to raise in any given period would be insufficient to meet its obligations to holders of maturing short-term dollar liabilities.¹²⁵ Most importantly, this funding model left these institutions highly vulnerable to the breakdown of repo, commercial paper, and *f/x* swap markets.

In August 2007, what began as a localized disruption within the U.S. subprime mortgage market metastasized into a full-blown crisis within international wholesale funding markets. As described by Gary Gorton and Andrew Metrick,

¹²⁰ McGuire & von Peter, *supra* note 119, at 50.

¹²¹ *Id.*

¹²² *Id.*

¹²³ See WILLIAM A. ALLEN, INTERNATIONAL LIQUIDITY AND THE FINANCIAL CRISIS 33 (2013). This funding model involved selling the domestic currency spot (for dollars) and buying it forward (with dollars). This, in turn, required the institution to have access to the U.S. dollars necessary to repurchase the domestic currency. As the crisis unfolded, the withdrawal of liquidity from wholesale funding markets generated significant upward pressure on prices with *f/x* swap markets. *Id.* at 50–51.

¹²⁴ McGuire & von Peter, *supra* note 119, at 48, 53.

¹²⁵ *Id.*

concerns about counterparty credit risk led to a dramatic increase in the costs of repo financing.¹²⁶ These concerns also precipitated the withdrawal of liquidity from both the commercial paper¹²⁷ and f/x swap markets.¹²⁸ As this liquidity evaporated, financial institutions in the United States began to accumulate dollars for the purposes of meeting their domestic liabilities, resulting in a corresponding decrease in the availability of U.S. dollar funding for financial institutions in other jurisdictions.¹²⁹ As a result, financial institutions outside the United States found it increasingly expensive—and in some cases impossible—to roll over their short-term U.S. dollar liabilities.¹³⁰ The BIS estimates that this U.S. dollar funding gap for European banks was somewhere between \$USD1.1 and 1.3 trillion as of the summer of 2007.¹³¹ Significant funding gaps also emerged for Japanese yen in the United Kingdom, for euros in the United States, and for Swiss francs in the euro area.¹³²

Financial institutions seeking to plug this U.S. dollar funding gap were confronted with a limited range of options. The first option was to sell U.S. dollar-denominated assets. Generally speaking, the assets available for sale included U.S. treasury securities, as well as dollar-denominated corporate bonds,

¹²⁶ See Gary Gorton & Andrew Metrick, *Securitized Banking and the Run on Repo*, 104 J. FIN. ECON. 425 (2012).

¹²⁷ See Marcin Kacperczyk & Philipp Schnabl, *When Safe Proved Risky: Commercial Paper During the Financial Crisis of 2007–2009*, 24 J. ECON. PERSP. 29 (2010).

¹²⁸ See Naohiko Baba et al., *The Spillover of Money Market Turbulence to FX Swap and Cross-Currency Swap Markets*, BIS Q. REV., Mar. 2008, at 73.

¹²⁹ Rosalind Z. Wiggins & Andrew Metrick, *The Federal Reserve's Financial Crisis Response C: Providing US Dollars to Foreign Central Banks* (Yale Program on Fin. Stability Case Study 2015-1C-V1, 2016); Brunnermeier, *supra* note 24, at 95; ALLEN, *supra* note 123, at 32.

¹³⁰ Wiggins & Metrick, *supra* note 129, at 8. Notably, the domestic (foreign) liabilities of U.S. (foreign) financial institutions included their contingent liabilities to provide backstop liquidity to sponsored structured finance vehicles. See ARMOUR ET AL., *supra* note 15, ch. 21.

¹³¹ McGuire & von Peter, *supra* note 119, at 48.

¹³² ALLEN, *supra* note 123, at 38.

asset-backed securities, structured finance products, and other privately-issued debt securities.¹³³ While the market for U.S. treasury securities is the most liquid in the world, the tightening of credit conditions within repo markets during the crisis made these securities amongst the most sought-after collateral assets.¹³⁴ In many cases, financial institutions would have therefore preferred to use these government securities to obtain U.S. dollar repo financing rather than sell them outright.¹³⁵ This left privately-issued debt securities as the most likely candidates for sale. The problem here was that prevailing market conditions during the crisis meant that financial institutions would have often been forced to sell these assets into illiquid and volatile markets, thus exposing themselves to potentially significant losses. Viewed from this perspective, correlated selling of dollar-denominated assets by financial institutions seeking to plug the U.S. dollar funding gap would have contributed to the pernicious fire sale dynamics observed during the financial crisis.

The second option was for these financial institutions to reduce their U.S. dollar lending activities.¹³⁶ For many financial institutions outside the United States, this involved cutting back on their trade financing and related currency hedging businesses. Data from the Organization for Economic Cooperation and Development suggests that the value of global merchandise trade decreased by forty-two percent between July 2008 and February 2009.¹³⁷ While a considerable

¹³³ McGuire & von Peter, *supra* note 119, at 58.

¹³⁴ See Peter Hördahl & Michael R. King, *Developments in Repo Markets During the Financial Turmoil*, BIS Q. REV., Dec. 2008, at 37, 46.

¹³⁵ *Id.*

¹³⁶ Brunnermeier, *supra* note 24, at 95. For empirical evidence relating to the reduction in dollar lending by European banks during the financial crisis, see Victoria Ivashina et al., *Dollar Funding and the Lending Behavior of Global Banks* (Nat'l Bureau of Econ. Research, Working Paper No. 18528, 2012).

¹³⁷ Robert C. Shelburne, *The Global Financial Crisis and its Impact on Trade: The World and the Emerging European Economies 2* (U.N. Econ. Comm. for Eur., Discussion Paper No. 2010.2, 2010).

proportion of this decrease is no doubt attributable to a reduction in demand and production during the crisis, evidence suggests that the U.S. dollar funding gap also contributed to a reduction in credit supply and corresponding increase in the costs of trade financing.¹³⁸ The WTO has estimated that spreads on short-term trade credit facilities peaked at between 300 to 600 basis points (or 3–6%) over LIBOR during the crisis, compared with an average of between 10 to 20 basis points under normal market conditions.¹³⁹ This dramatic increase in the costs of trade financing was compounded by the illiquidity within the f/x swap market, which increased the costs incurred by exporters in order to hedge against volatility in the exchange rate between the U.S. dollar and their domestic currencies.¹⁴⁰ Through these channels, the global dollar shortage at the height of the financial crisis likely contributed to the generalized contraction of credit, international trade, and economic growth.

The breakdown of private wholesale funding markets during the financial crisis forced many banks and other eligible financial institutions to seek ELA and other forms of government support.¹⁴¹ As we have already seen, however, the central banks that administered conventional ELA facilities were typically not in a position to provide the U.S. dollars and other foreign currencies that these financial institutions required.¹⁴² It was in response to this problem that the Federal Reserve, in coordination with the central banks in several

¹³⁸ See Daniel McDowell, *Emergent International Liquidity Agreements: Central Bank Cooperation after the Global Financial Crisis*, J. INT'L REL. & DEV. (forthcoming 2017).

¹³⁹ *The Challenges of Trade Financing*, WTO (2009), https://www.wto.org/english/thewto_e/coher_e/challenges_e.htm [perma.cc/7NN6-A67Z].

¹⁴⁰ McDowell, *supra* note 138.

¹⁴¹ ALLEN, *supra* note 123, at 49.

¹⁴² A notable exception were domestic subsidiaries of foreign banks, which typically had access to domestic ELA facilities and could lend on the borrowed currencies to their foreign parents. Wiggins & Metrick, *supra* note 129, at 7.

other key jurisdictions, undertook one of the most ambitious and important policy interventions of the financial crisis.

On December 12, 2007, the Federal Reserve announced that it had entered into temporary reciprocal foreign currency swap lines with the European Central Bank (the “ECB”) and the Swiss National Bank (the “SNB”).¹⁴³ These swap lines permitted the ECB and SNB to exchange their domestic currencies for U.S. dollars that could then be lent to banks and other domestic financial institutions in order to plug their U.S. dollar funding gaps. At the time, the Fed characterized the extension of these swap lines as designed to “address elevated pressures in short-term funding markets.”¹⁴⁴ In effect, the objective was to mitigate the risk that foreign financial institutions would be unable to roll over their short-term U.S. dollar liabilities, thereby reducing the pressure on these institutions to engage in destabilizing fire sales of U.S. dollar-denominated assets or cut back on their trade financing and other lending activities.¹⁴⁵

These central bank swap lines worked as follows. When a foreign central bank wished to draw on the swap line, it would sell a given quantity of its own currency to the Federal Reserve at the prevailing exchange rate.¹⁴⁶ Contemporaneously with this sale, the central bank would agree to repurchase its currency from the Fed at the same exchange rate at an agreed-upon maturity date.¹⁴⁷ The foreign central bank would then

¹⁴³ Press Release, Bd. of Governors of the Fed. Reserve Sys., Federal Reserve and Other Central Banks Announce Measures Designed to Address Elevated Pressures in Short-term Funding Markets (Dec. 12, 2007), <http://www.federalreserve.gov/newsevents/press/monetary/20071212a.htm> [perma.cc/BP2C-DCWR].

¹⁴⁴ *Id.*

¹⁴⁵ Michael J. Fleming & Nicolas J. Klagge, *The Federal Reserve’s Foreign Exchange Swap Lines*, FED. RES. BANK N.Y. CURRENT ISSUES IN ECON. & FIN., April 2010, at 1, 3.

¹⁴⁶ *Id.* at 2. While these swap lines were technically reciprocal, for ease of exposition this description focuses on the mechanics of how foreign central banks purchased U.S. dollars from the Federal Reserve, lent them on to domestic financial institutions, and subsequently returned them to the Fed.

¹⁴⁷ *Id.*

establish the eligibility requirements, range of acceptable collateral, and other terms and conditions under which it would lend the newly acquired dollars to domestic banks and other financial institutions.¹⁴⁸ It would then extend U.S. dollar loans to eligible institutions, typically by way of fixed or variable-rate auctions.¹⁴⁹ The duration of these loans ranged from overnight, to one week, one month, and three month terms. At the conclusion of the swap, the foreign central bank would repurchase its currency with U.S. dollars and pay the Fed interest equal to the interest rate charged on the dollar loans extended to eligible institutions.¹⁵⁰ Importantly, the fact that the foreign central bank stood between the Fed and eligible institutions left it exposed to both credit risk in connection with its U.S. dollar loans and, in the event that these loans were not repaid before the expiry of the swap, foreign exchange risk in connection with its obligations to repurchase its domestic currency.¹⁵¹

The first swap lines established by the Federal Reserve and other central banks were relatively modest in both their scale and scope. The swap lines between the Fed and the ECB and the SNB were initially capped at \$USD20 billion and \$USD4 billion, respectively, and only approved for a period of up to 6 months.¹⁵² However, as the financial crisis continued

¹⁴⁸ See, e.g., News Release, Bank of Eng., U.S. Dollar Overnight Repo Operations: Bank of England Market Notice (Sept. 22, 2008), <http://www.bankofengland.co.uk/markets/Documents/market-notice080918.pdf> [perma.cc/2ZWU-7K9N].

¹⁴⁹ Fleming & Klagge, *supra* note 145, at 2.

¹⁵⁰ *Id.* While the Fed did not pay interest on the foreign currency it received under the swap, it did commit to keep the currency in an account in its name at the foreign central bank. *Id.* at 2–3.

¹⁵¹ Foreign exchange risk arises in this context by virtue of the necessity of acquiring U.S. dollars on the open market in order to repurchase the domestic currency. Specifically, were the U.S. dollar to appreciate against the relevant currency during the term of the swap, the fact that the spot and forward rates under the swap were identical would mean that the costs of repurchasing the domestic currency in the second leg of the swap would exceed the costs of acquiring dollars in the first leg.

¹⁵² Fed. Res. Press Release, *supra* note 143.

to unfold, the Fed was compelled to expand this nascent network of central bank swap lines and to pump significantly more U.S. dollar liquidity into this network. Following the failure of Lehman Brothers on September 15, 2008, the Fed announced a significant increase in the level of U.S. dollar funding available under its swap lines with the ECB and SNB.¹⁵³ It also announced new swap lines with the Bank of Japan (\$USD60 billion), the Bank of England (\$USD40 billion), and the Bank of Canada (\$USD10 billion).¹⁵⁴ The following week, the Fed extended swap lines to the Reserve Bank of Australia (\$USD10 billion), Svergis Riksbank (\$USD10 billion), Norges Bank (\$USD5 billion), and Danmarks Nationalbank (\$USD5 billion).¹⁵⁵

In response to the continued deterioration of global credit markets, the Fed announced on September 29 that it was more than doubling the aggregate amount of U.S. dollars available under these swap lines from \$USD290 billion to \$USD620 billion.¹⁵⁶ This was followed by the announcement on October 13 that the Fed was removing the cap on its swap lines with the ECB, SNB, and the Bank of England, thus effectively giving these central banks unlimited access to U.S. dollar liquidity.¹⁵⁷ The aggregate amount outstanding under

¹⁵³ Press Release, Bd. of Governors of the Fed. Reserve Sys., Federal Reserve and Other Central Banks Announce Further Measures to Address Elevated Pressures in Funding Markets (Sept. 18, 2008), <http://www.federalreserve.gov/newsevents/press/monetary/20080918a.htm> [perma.cc/ZUW5-2YMG].

¹⁵⁴ *Id.*

¹⁵⁵ Press Release, Bd. of Governors of the Fed. Reserve Sys., Federal Reserve and Other Central Banks Announce Additional Measures to Address Elevated Pressures in Funding Markets (Sept. 24, 2008), <https://www.federalreserve.gov/newsevents/press/monetary/20080924a.htm> [perma.cc/4VCR-7PV2].

¹⁵⁶ Press Release, Bd. of Governors of the Fed. Reserve Sys., Federal Reserve and Other Central Banks Announce Further Coordinated Actions to Expand Significantly the Capacity to Provide U.S. Dollar Liquidity (Sept. 29, 2008), <https://www.federalreserve.gov/newsevents/press/monetary/20080929a.htm> [perma.cc/2M9T-F7WR].

¹⁵⁷ Press Release, Bd. of Governors of the Fed. Reserve Sys., Federal Reserve and Other Central Banks Announce Further Measures to Provide

these swap lines would peak at \$US586 billion in December 2008 (see Figure 3).¹⁵⁸ In total, the Federal Reserve would make over \$USD10 trillion available to foreign central banks under these swap lines over the course of the financial crisis.¹⁵⁹ Similar central bank swap lines were established during the crisis to provide euros, yen, Swiss francs, and Chinese renminbi.¹⁶⁰

FIGURE 3: DRAWINGS UNDER FEDERAL RESERVE SWAP LINES (2007–2009)¹⁶¹
(\$USD MILLIONS AS AT END OF QUARTER)

	2007 Q4	2008 Q1	2008 Q2	2008 Q3	2008 Q4	2009 Q1	2009 Q2	2009 Q3	2009 Q4
Canada	0	0	0	0	0	0	0	0	0
ECB	20,000	15,000	50,000	174,742	291,352	165,717	59,899	43,662	6,506
Switzerland	4,000	6,000	12,000	28,900	25,175	7,318	369	0	0
Japan	0	0	0	29,622	122,716	61,025	17,923	1,530	545

Broad Access to Liquidity and Funding to Financial Institutions (Oct. 13, 2008), <https://www.federalreserve.gov/newsevents/press/monetary/20081013a.htm> [perma.cc/7GGG-G92T].

¹⁵⁸ ALLEN, *supra* note 123, at 113.

¹⁵⁹ James Felkerson, *\$29,000,000,000,000: A Detailed Look at the Fed's Bailout by Funding Facility and Recipient* 11 (Levy Econ. Inst., Working Paper No. 698, 2011), http://www.levyinstitute.org/pubs/wp_698.pdf [perma.cc/X6XW-ENM2].

¹⁶⁰ For an overview of these other central bank swap networks, see ALLEN, *supra* note 123, at 86–98.

¹⁶¹ *Id.* at 114.

many observers as one of the most important and effective policy responses to the financial crisis.¹⁶² Yet it would be a mistake to conclude from this success that this bilateral swap network represents a comprehensive and durable solution to foreign currency liquidity problems. As described in the next section, the design of these swap lines fails to counterbalance the potentially significant distortions generated by this ambitious form of state-sponsored liquidity insurance. The swap lines also fail to create truly credible international commitments, exposing the jurisdictions that rely on them to unpredictable and self-interested decisions by foreign policymakers.

These shortcomings beg an important question: how might policymakers design a more effective framework for the provision of FCLA? This question has taken on an added degree of urgency in light of recent market developments. Since the beginning of 2014, Eurodollar markets have experienced a number of episodes broadly resembling the U.S. dollar liquidity shortage at the height of the financial crisis.¹⁶³ These episodes have occurred in the context of a more general trend in terms of the deterioration of conditions within U.S. dollar wholesale funding markets. Figure 4 shows the cross-currency basis swap spreads over 3-month LIBOR between the U.S. dollar and each of the euro, pound sterling, and Japanese yen from 2005 to 2016. These spreads, which reflect the cost of borrowing U.S. dollars using f/x swaps, are a useful barometer for potential liquidity problems within wholesale funding markets.¹⁶⁴

¹⁶² See ALLEN, *supra* note 123, at 117; Fleming & Klagge, *supra* note 145, at 7.

¹⁶³ See Izabella Kaminska, *All About the Eurodollars, Redux*, FIN. TIMES: ALPHAVILLE (Sept. 24, 2015, 3:18 AM), <https://ftalphaville.ft.com/2015/09/24/2140580/all-about-the-eurodollars-redux/>. See also Izabella Kaminska, *Petrodollars are Eurodollars, and Eurodollar Base Money is Shrinking*, FIN. TIMES: ALPHAVILLE (Jan. 25, 2016, 7:09 AM), <https://ftalphaville.ft.com/2016/01/25/2151037/ Petrodollars-are-eurodollars-and-eurodollar-base-money-is-shrinking/>.

¹⁶⁴ See Michael Chang & Carl Lantz, *Credit Suisse Basis Points: Cross-Currency Basis Swaps*, CREDIT SUISSE (Apr. 19, 2013), [https://credit-suisse.com/researchandanalytics \[perma.cc/P2FV-ETPK\]](https://credit-suisse.com/researchandanalytics [perma.cc/P2FV-ETPK]).

FIGURE 4: CROSS-CURRENCY BASIS SWAP SPREADS¹⁶⁵

As Figure 4 clearly illustrates, basis swap spreads between the U.S. dollar and other major currencies have recently widened to levels last observed during the global financial crisis and subsequent European sovereign debt crisis.¹⁶⁶ The growing stress within these markets has been attributed to several factors, including: the sustained increase in the price of the U.S. dollar relative to the euro, pound sterling, and other major currencies over this period¹⁶⁷; the ECB's negative interest

¹⁶⁵ Thomson Reuters (2016).

¹⁶⁶ Although, the more gradual deterioration of market conditions from 2014 onward will have undoubtedly provided market participants with the opportunity to more proactively address the resulting funding pressures by, for example, reducing any *f/x* imbalances on their balance sheets.

¹⁶⁷ See Hyun Song Shin, Econ. Advisor & Head of Research, Bank of Int'l Settlements, Speech Presented at the World Bank Conference, The State of Economics, the State of the World, Washington, DC: Global Liquidity and Procyclicality, 2–5 (June 8, 2016), <http://www.bis.org/speeches/sp160608.htm> [perma.cc/Q376-HFXB]. See also Izabella Kaminska, *Textbook Defying Global Dollar Shortages*, FIN. TIMES: ALPHAVILLE (June 9, 2016, 7:45 AM), <https://ftalphaville.ft.com/2016/06/09/2165690/textbook-defying-global-dollar-shortages/>.

rate policy¹⁶⁸; the introduction of comprehensive reforms targeting U.S. money market funds¹⁶³; and programs such as the Federal Reserve's new Term Deposit Facility that have had the effect of incentivizing U.S. banks to repatriate short-term dollar liquidity from abroad.¹⁶⁹ Looking forward, this stress is likely to intensify as the Fed raises interest rates from their current historic lows and ramps up policies such as reverse repo facilities designed to unwind quantitative easing and thus absorb dollar liquidity from the international financial system.¹⁷⁰ The resulting withdrawal of short-term U.S. dollar liquidity will inevitably put pressure on foreign banks, other financial institutions, and commercial firms that rely on Eurodollar markets.¹⁷¹

The existing central bank swap lines do little to constrain the build-up of these foreign currency funding pressures. There is also no guarantee, especially in light of the shifting political winds in the United States, that the Federal Reserve will intervene to support global U.S. dollar funding markets during the next financial crisis—or that it will take into account the global repercussions of its own policy decisions in potentially triggering this crisis. President Trump's vision for 'Making America Great Again' may not include the provision of FCLA to foreign banks and other financial institutions. These developments suggest that the foreign currency liquidity crisis of 2007–2009 may provide us with a window into the catalysts of future crises. They also frame why designing a more effective framework for the provision of FCLA should be

¹⁶⁸ See Izabella Kaminska, *Eurodollars, FX Reserve Managers and the Offshore RRP Issue*, FIN. TIMES: ALPHAVILLE (Sept. 1, 2015, 5:39 AM), <https://ftalphaville.ft.com/2015/09/01/2139085/eurodollars-fx-reserve-managers-and-the-offshore-rrp-issue/>.

¹⁶⁹ See Izabella Kaminska, *All About the Eurodollars*, FIN. TIMES: ALPHAVILLE (Sept. 5, 2014, 11:14 AM), <https://ftalphaville.ft.com/2014/09/05/1957231/all-about-the-eurodollars/>; Kaminska, *supra* note 168.

¹⁷⁰ See Kaminska, *supra* note 168.

¹⁷¹ Especially where these firms' balance sheets are characterized by significant maturity and currency mismatches.

viewed by policymakers as an important and pressing priority.

V. DESIGNING AN EFFECTIVE FRAMEWORK FOR FCLA

The turmoil of 2007–09 revealed an important fault line in the structure of the global financial and economic system. On one side of the divide is a global network of financial markets and institutions characterized by high levels of integration and interconnectedness, where financial institutions located in one country can, with the stroke of a few keys create liabilities denominated in the currency of another country, and where these liabilities can grease the wheels of trade, finance, and investment across every corner of the globe. On the other side of the divide is an emerging, but still highly fragmented, international monetary, regulatory, and crisis management architecture, vulnerable to regulatory arbitrage, acute coordination problems, and conflicting domestic political preferences. As Benn Steil and Manuel Hinds observe, this divide represents a significant threat to economic globalization: “If anything is likely to throw globalization into reverse, it is not trade itself, but the money that facilitates it. National monies and global markets simply do not mix; together they make a deadly brew of currency crises and geopolitical tension and create ready pretexts for damaging protectionism.”¹⁷²

This Part examines some of the ways that one might begin to bridge this divide by designing a more effective framework for the provision of FCLA: one that reflects the imperatives of Bagehot’s Dictum while simultaneously constraining the moral hazard and other problems generated by this ambitious state-supported liquidity insurance. Broadly speaking, the available policy alternatives include the introduction of a blanket prohibition against the issuance of Eurodollar liabilities, replacing the Eurodollar market with a global currency and central bank, and strengthening the existing international architecture for the provision of FCLA.

¹⁷² STEIL & HINDS, *supra* note 10, at 8.

A. A Blanket Prohibition Against Eurodollar Liabilities

As this Article has shown, scholars such as Morgan Ricks see a clear relationship between private money creation, runs, and financial instability.¹⁷³ As Ricks observes, while deposit guarantee schemes and ELA facilities have proven to be relatively effective mechanisms for dampening the destabilizing impact of private money creation within the conventional banking system, the effectiveness of these mechanisms has been eroded by the emergence and growth of a vibrant and diverse shadow banking system.¹⁷⁴ In response, Ricks proposes a public-private partnership pursuant to which banks would be licensed as the *exclusive* issuers of all deposits, short-term liabilities, and other “money-claims.”¹⁷⁵ These money-claims would be explicitly backed by a state guarantee, thereby eliminating the distinction between public and private money and, with it, the incentives of short-term creditors to engage in destabilizing run-like behavior.¹⁷⁶ In exchange, the state would receive a periodic fee from each bank based on the returns from its investment portfolio and the quantity of its issued and outstanding money-claims.¹⁷⁷ Banks would also be subject to portfolio, capital, and other prudential regulatory requirements designed to ameliorate any potential moral hazard problems generated by the state guarantee.¹⁷⁸

Ricks’ proposal envisions that financial institutions other than licensed banks would be prohibited from issuing deposit

¹⁷³ See the discussion of Ricks’ “money problem” in Part III, *supra*.

¹⁷⁴ RICKS, *supra* note 79, at 215–19. As Ricks observes, deposit guarantee schemes and ELA facilities also introduce potentially significant distortions: encouraging growth in the size of financial institutions, the use of leverage, and the oversupply of credit to the economy. *Id.* at 3.

¹⁷⁵ *Id.* at 226, 235. Under Ricks proposal, banks would be licensed to issue a specific quantity of money-claims. The system would then employ a cap and trade system, enabling banks to sell excess capacity to other banks with more attractive investment opportunities. *Id.* at 228.

¹⁷⁶ *Id.* at 227, 241.

¹⁷⁷ *Id.* at 226.

¹⁷⁸ *Id.* at 225.

liabilities and other money-claims.¹⁷⁹ Given the domestic locus of bank licensing regimes, one of the logical consequences of this proposal would thus be the complete abolition of the Eurodollar market. This is no accident. As Ricks explains: “Simply put, the Eurodollar markets—and the Eurocurrency markets more generally—are incompatible with financial stability”.¹⁸⁰ Writing from the vantage point of the United States, Ricks goes on to identify two possible avenues for abolishing the Eurodollar market. The first avenue would be to impose a blanket prohibition on the issuance of short-term U.S. dollar liabilities by financial institutions incorporated and licensed outside the United States. In pursuing this avenue, the United States would find little support in public international law. The IMF Articles of Agreement do not prohibit the use of a currency issued by one member state as legal tender in another member state.¹⁸¹ Similarly, while customary international law recognizes the sovereignty of states over monetary affairs, it does not provide a clear basis for incursions into the monetary sovereignty of another state for the purpose of restricting the use of foreign currencies.¹⁸² What is more, neither the IMF Articles of Agreement nor customary international law explicitly address the issue of *private* money creation.¹⁸³ As a result, any prohibition would almost cer-

¹⁷⁹ *Id.* at 226.

¹⁸⁰ *Id.* at 239.

¹⁸¹ For the analysis of one former IMF general counsel on this point, see François Gianviti, *Use of a Foreign Currency Under the IMF's Articles of Agreement*, in 3 CURRENT DEVELOPMENTS IN MONETARY AND FINANCIAL LAW 817 (2005).

¹⁸² LASTRA, *supra* note 7, at 17 (“With regard to the question of whether the issuer of a currency may prohibit the use of its currency by another country, there is at present no basis in international law to support the view that the issuer may object to the currency being used by other countries.”). Consistent with this position, courts in the United States have explicitly acknowledged the right of the U.S. government to designate foreign currencies as legal tender without the consent of the issuing country. *See* Tyson v. United States, 285 F.2d 19, 22 (10th Cir. 1960).

¹⁸³ In this respect, the threat that a contract creating a Eurodollar liability may be invalidated under *private* international law—e.g., that the

tainly need to take the form of unilateral restrictions on market access: for example, denying foreign banks and other financial institutions that issue Eurodollar liabilities (and their affiliates) access to both the Federal Reserve's ELA and other liquidity facilities, as well as the U.S. dollar clearing services provided by domestic banks.¹⁸⁴

In theory, a unilateral prohibition would serve to shift the risk of foreign currency liquidity problems to the financial institutions that issued Eurodollar liabilities and, ultimately, to the jurisdictions that permitted them to do so. In practice, however, the impact of this unilateral prohibition is likely to be relatively modest insofar as foreign institutions still enjoyed access to U.S. dollar liquidity through international wholesale funding and f/x swap markets.¹⁸⁵ Somewhat perversely, then, by increasing the reliance of foreign institutions on these markets, restrictions on market access may only serve to amplify the instability associated with widespread market breakdown.

The second avenue would be to negotiate a multilateral agreement pursuant to which signatory states agreed to prohibit domestic financial institutions from issuing Eurodollar liabilities.¹⁸⁶ Where the signatories to this agreement include the governments of other major international financial centers, this avenue would have the effect of bringing interna-

U.S. prohibition would be applied on an extraterritorial basis—may prove more effective in disrupting the Eurodollar market. For a discussion of the use of private international law as a mechanism for constraining international regulatory arbitrage, see Annelise Riles, *Managing Regulatory Arbitrage: A Conflicts of Law Approach*, 47 *CORNELL INT'L L. J.* 63 (2014).

¹⁸⁴ See RICKS, *supra* note 79, at 239. In theory, of course, these market access restrictions could be even broader: encompassing not only U.S. dollar clearing services, but also restrictions on the ability to conduct any business in U.S. markets or with U.S. clients.

¹⁸⁵ Although the fact that these markets are prone to breakdown during periods of widespread panic and instability would almost certainly contribute to the build-up of risk within the remaining Eurodollar market.

¹⁸⁶ RICKS, *supra* note 79, at 239–40.

tional wholesale funding and f/x swap markets within the perimeter of this prohibition.¹⁸⁷ Simultaneously, of course, a multilateral agreement constraining the issuance of Eurodollar liabilities may simply serve to drive these markets to other (non-signatory) states. While Ricks views this multilateral avenue as more promising, the likelihood of reaching an agreement—to say nothing of its effectiveness—would ultimately hinge on the potential for this type of regulatory arbitrage and the corresponding threat that the issuance of Eurodollar liabilities outside the perimeter of the prohibition would undermine financial stability within signatory states.¹⁸⁸

There is compelling logic in Ricks' argument that strengthening sovereign authority over private money creation would yield significant benefits from the perspective of domestic financial stability. A blanket prohibition against the issuance of Eurodollar liabilities would shift responsibility for the provision of FCLA to the countries and financial institutions that failed to comply with the prohibition, thereby strengthening their incentives to more proactively address potential foreign currency liquidity problems, and reducing potential moral hazard problems. Restrictions on market access for foreign banks and other institutions issuing Eurodollar liabilities would also potentially help reduce—although almost certainly not eliminate—the risk of cross-border contagion stemming from the materialization of foreign currency liquidity problems.

Ultimately, however, these domestic benefits must be weighed against the wider implications of abolishing the Eurodollar market. As this Article has described, a significant

¹⁸⁷ An agreement covering the United States, European Union, United Kingdom, Singapore, Hong Kong, and Japan, for example, would cover the vast majority of transactions within the f/x swap market. See Bank of Int'l Settlements, *Turnover of OTC Foreign Exchange Instruments, by Country* (Sept. 1, 2016), http://www.bis.org/statistics/d11_2.pdf [perma.cc/EK3Q-JEHY].

¹⁸⁸ As discussed in greater detail in Section V.C, any agreement would also likely need to be accompanied by credible restrictions on market access targeting financial institutions incorporated and licensed to carry on business in non-signatory states.

proportion of international trade outside the United States is invoiced and settled in U.S. dollars. This trade is often supported by short-term U.S. dollar trade financing provided by foreign banks and other financial institutions.¹⁸⁹ Foreign financial institutions are also important participants in international U.S. dollar-denominated wholesale funding and *f/x* swap markets. The funding obtained in these markets is then often used to support U.S. dollar loans and other investments.¹⁹⁰ The elimination of the Eurodollar market would thus necessitate a significant restructuring of many of the markets and institutions at the heart of the global financial and economic system. While this restructuring may ultimately represent a transitional problem, it is a problem that may nevertheless trigger significant economic disruption and financial instability.

While it is obviously difficult to predict precisely how this restructuring would unfold, two possible scenarios stand out. These scenarios are not mutually exclusive, and may even play out in parallel with one another.¹⁹¹ In the first scenario, large numbers of foreign banks might seek to obtain banking licenses in the United States in order to ensure their continued ability to issue U.S. dollar denominated money-claims. The net effect of this migration would thus be to bring the Eurodollar market back ‘onshore’. It would also create an enormous concentration of financial and economic activity in one country, further entrenching the United States as the *de facto*

¹⁸⁹ While Ricks excludes “trade credit” from his definition of a money-claim, this must be distinguished from trade financing arrangements such as letters of credit, supply chain finance, or factoring. Whereas trade credit effectively refers to the ability to purchase goods on credit and the resulting creation of short-term *inter-firm* liabilities generally referred to as “accounts payable,” trade financing generally involves the extension of loans, guarantees, or other short-term liabilities by third party *financial institutions* for the purpose of facilitating international trade. That Ricks’ exception only extends to these narrow inter-firm liabilities is apparent from his proposed statutory language. *Id.* at 244.

¹⁹⁰ Without access to these markets, foreign financial institutions holding U.S. dollar assets would face significant foreign exchange risk.

¹⁹¹ Although it is likely that gravitation toward either extreme would be the most likely to engender pronounced instability.

global lender of last resort and increasing the exposure of the rest of the world to its fiscal, monetary, and regulatory policy decisions.¹⁹² Strengthening the monetary sovereignty of the United States would thus come at the expense of the policy sovereignty of other countries.

In the second scenario, firms might switch from the U.S. dollar to other currencies for the purposes of international trade, finance, and investment. The resulting fragmentation of the currency composition of these business activities would likely precipitate an increase in financing and trading costs and create an impediment to global economic integration. Importantly, the existence of winners and losers under both of these scenarios renders the prospects of a binding multilateral agreement to dismantle the Eurodollar market decidedly bleak. At the same time, any unilateral action would risk provoking retaliatory action from other states. Moreover, under either scenario there is a significant risk that the restructuring process may unfold in a disorderly fashion. Viewed from this perspective, the practical effect of Ricks' proposal may simply be to undermine financial and economic globalization and export financial instability from the United States to the rest of the world.

B. A Global Currency and Central Bank

Ricks' proposal to dismantle the Eurodollar market envisions the vigorous assertion of the state's sovereign authority over private money creation. Other, even more radical, proposals envision the transfer of this authority to international institutions. Proposals for an international monetary authority and currency have a long and colorful history. Perhaps the most (in)famous proposal is John Maynard Keynes' scheme for

¹⁹² Thereby further intensifying the global financial cycle. See Hélène Rey, *Dilemma not Trilemma: The Global Financial Cycle and Monetary Policy Independence*, FED. RES. BANK KANSAS CITY (2013), <https://www.kansas-cityfed.org/hgiSo/publicat/sympos/2013/2013Rey.pdf> [perma.cc/47G7-Y6BT].

the creation of an ‘international clearing union.’¹⁹³ Advanced by Keynes at the Bretton Woods conference in July 1944, the international clearing union was designed to prevent the build-up of destabilizing international trade imbalances through a multilateral system of debits and credits denominated in a new unit of account known as ‘bancor.’¹⁹⁴ Recently, scholars such as Robert Hockett have returned to Keynes’ original proposal and advocated it as the basis for the creation of a global currency and central bank.¹⁹⁵ While the institutional details of these proposals vary, they generally involve the creation of a new currency, issued and managed by an international monetary authority, and intended for use alongside existing domestic and supranational currencies.¹⁹⁶

The benefits of a global currency are typically framed as flowing from the potential to create a global ‘risk-free’ asset,

¹⁹³ See JOHN MAYNARD KEYNES, *ACTIVITIES 1940–1944: SHAPING THE POST-WAR WORLD: THE CLEARING UNION* (1980), reprinted in 25 *THE COLLECTED WRITINGS OF JOHN MAYNARD KEYNES* (Donald Moggridge ed., Cambridge Univ. Press, 1980).

¹⁹⁴ See *id.* for further details regarding Keynes’ scheme as originally proposed. The scheme encountered significant resistance at the Bretton Woods conference, especially from the United States, and was abandoned in favor of what would eventually become the IMF.

¹⁹⁵ Robert Hockett, *Bretton Woods 1.0: A Constructive Retrieval for Sustainable Finance*, 16 N.Y.U. J. LEGIS. & PUB. POL’Y. 401 (2013). See also EMANUEL FARHI ET AL., *REFORMING THE INTERNATIONAL MONETARY SYSTEM* 31–49 (2011).

¹⁹⁶ At the same time, not all proposals envision the creation of a new currency. See FARHI ET AL., *supra* note 195. A related, if somewhat more modest, proposal is to promote the use of the Special Drawing Rights (“SDRs”) issued by the IMF in international commercial transactions. For a recent synthesis of the main arguments for and against the expanded use of SDRs in international commercial transactions, see IMF, *Enhancing International Monetary Stability—A Role for the SDR?* (Jan. 7, 2011), <https://www.imf.org/external/np/pp/eng/2011/010711.pdf> [perma.cc/8GAV-J9UH]. More ambitious proposals, meanwhile, envision that an international currency could eventually replace existing national currencies in the same way that the euro did for euro area member states.

reduce exchange rate volatility, and moderate the destabilizing impact of global trade imbalances.¹⁹⁷ In theory, however, the creation of a global currency and central bank could also help address foreign currency liquidity problems. The promise of an international currency—let’s call it ‘bancor’ in honor of Keynes¹⁹⁸—from this perspective resides in the ability of a new international monetary authority (“IMA”) to effectively consolidate authority for monetary policy, the licensing and prudential regulation of financial institutions engaged in private money creation, and the access of these institutions to FCLA. The logical starting point would be for signatory states to confer upon the IMA clear authority over all matters relating to the issuance of short-term liabilities denominated in bancor. Banks and other financial institutions licensed to carry on business in these jurisdictions would then be required to apply to the IMA for an *additional* license to be able to issue short-term bancor denominated liabilities.¹⁹⁹ This license would then be granted on the condition that financial institutions comply with a limited range of targeted prudential requirements—e.g., currency-specific portfolio, capital, and liquidity constraints—designed to eliminate the prospect

¹⁹⁷ See, e.g., Mark Carney, then Governor of the Bank of Can., Remarks at the Spruce Meadows Changing Fortunes Round Table, Calgary, Alberta: Restoring Faith in the International Monetary System (Sept. 10, 2010), <http://www.bis.org/review/r100916a.pdf> [perma.cc/ZG7U-EWM7].

¹⁹⁸ And in honor of the tradition of naming hypothetical international currencies ‘bancor’ in honor of Keynes. See e.g., Hockett, *supra* note 195, at 480.

¹⁹⁹ Notably, direct supervisory authority over domestic financial institutions is not a feature of most proposals for the creation of an IMA and currency. One possible alternative would be for signatory states to retain supervisory authority under the oversight of an IMA. This oversight authority would then need to be coupled with a credible mechanism for imposing costs on signatory states that failed to (i) adopt adequate prudential regulation and supervision in connection with bancor denominated assets and short-term liabilities or (ii) take action to prevent large foreign exchange imbalances within their domestic banking systems.

of regulatory arbitrage and other distortions.²⁰⁰ Financial institutions would also be required to provide the IMA with information about their bancor denominated assets and liabilities on an ongoing basis.²⁰¹ Where these institutions experienced temporary liquidity problems, the IMA would then stand ready to provide bancor loans collateralized against high quality bancor denominated assets on terms that—reflecting Bagehot’s dictum—minimized potential moral hazard problems. By more firmly tethering monetary and regulatory authority, the creation of an international currency and central bank could thus eliminate some of the frictions that currently undermine the ability of domestic policymakers to monitor the build-up of the risks associated with private money creation, impose consistent and effective regulatory constraints across jurisdictions and institutions, and respond in a more timely and comprehensive fashion to international financial crises.

It would be an understatement to say that there are a number of significant obstacles to the creation and successful adoption of an international currency and central bank. The first obstacle would likely be to satisfy policymakers that the global economy represented what economists refer to as an “optimal currency area.”²⁰² Whether a particular economic region constitutes an optimal currency area is a function of a number of factors. These factors include: the volume of cross-border trade between the countries within the region; existing barriers to the free movement of goods, labour, and other factors of production between these countries; the degree of homogene-

²⁰⁰ In order to minimize unnecessary divergence or duplication, these requirements could be linked to the capital adequacy and liquidity rules produced by the Basel Committee on Banking Supervision (BCBS). See *BASEL COMM. ON BANKING SUPERVISION, BASEL III: A GLOBAL REGULATORY FRAMEWORK FOR MORE RESILIENT BANKS AND BANKING SYS.* (2011), <http://www.bis.org/publ/bcbs189.pdf> [perma.cc/382V-BRCH].

²⁰¹ The type of information that could be provided, and the uses to which it might be put, are examined in greater detail in Section V.C.

²⁰² See Robert A. Mundell, *A Theory of Optimal Currency Areas*, 51 *AM. ECON. REV.* 657 (1961).

ity in the economic structure and business cycles of the industries within these countries and; any differences in the volatility of prices across the region.²⁰³ The higher the level of economic integration and homogeneity, the more likely it is that a region will represent an optimal currency area. At the heart of this determination is then a tradeoff between the anticipated reduction in transaction costs and uncertainty associated with a currency union versus the constraints that this union imposes on the ability of domestic policymakers to adjust to idiosyncratic shocks through changes in domestic interest and exchange rates.²⁰⁴

The concept of an optimal currency area is far from perfect. Amongst other problems, the type of static and homogeneous economic regions that are most likely to represent optimal currency areas are—for the very same reasons—likely to suffer from sclerotic growth and innovation and inefficient and potentially destabilizing under-diversification.²⁰⁵ Nevertheless, even a cursory examination of the factors that determine whether a region constitutes an optimal currency area suggests that—as a threshold matter—the economic case for the creation of an international currency is far from clear cut.

The second challenge would be the naked political one that Keynes himself encountered at Bretton Woods.²⁰⁶ How does one persuade sovereign countries—and especially countries

²⁰³ For a synthesis of these variables, see PAUL R. KRUGMAN & MAURICE OBSTFELD, *INTERNATIONAL ECONOMICS: THEORY & POLICY*, 558–72 (7th ed. 2006). See also STEIL & HINDS, *supra* note 10, at 138–45.

²⁰⁴ Maurice Obstfeld, Professor of Econ., U. of Cal. Berkeley, Paul Mason, Senior Advisor, IMF Res. Dep't, Robert Mundell, 1999 Nobel Laureate and Professor of Econ., Colum. U., Remarks at the IMF Economic Forum—One World, One Currency: Destination or Delusion? (Nov. 8, 2000), <https://www.imf.org/en/News/Articles/2015/09/28/04/54/tr001108> [perma.cc/P65P-E6C5].

²⁰⁵ See STEIL & HINDS, *supra* note 10, at 141–45 for a more detailed overview of some of the theoretical problems associated with the concept of an optimal currency area.

²⁰⁶ For an excellent account of Keynes' experience at the Bretton Woods conference, see BENN STEIL, *THE BATTLE OF BRETTON WOODS: JOHN MAYNARD KEYNES, HARRY DEXTER WHITE, AND THE MAKING OF THE NEW WORLD ORDER* (2013).

that derive substantial benefits from the existing international system—to transfer authority over an important area of economic affairs to an international institution? This challenge would inevitably be compounded by thorny issues of institutional design. What sort of constraints would need to be imposed on domestic trade, fiscal, and monetary policy in order to make the new currency credible? How would the burdens of ELA be distributed between countries? And how would senior positions within the IMA be filled? These and other questions would all need to be answered in a way that persuaded the largest number of countries—representing the largest possible proportion of global trade, finance, and investment—to agree to the creation of a new international currency. As demonstrated by the European Union’s ongoing experiment with the single currency, failing to properly address these issues at the outset could undermine the new currency’s long-term credibility.

The third and fundamentally intertwined challenge would be how to make a new international currency attractive to a critical mass of financial and commercial counterparties. Currencies are often viewed as classic ‘network’ goods.²⁰⁷ In a nutshell, where a currency reaches a threshold level of use within a given market, it starts to develop its own gravity: with users attracted not only by the currency’s intrinsic value, but also by the fact that it is widely used. The path dependency created by these network effects is reflected in a form of ‘stickiness’—entrenching incumbent currencies and erecting a significant barrier to the emergence and widespread adoption of potential

²⁰⁷ See Paul Krugman, *Vehicle Currencies and the Structure of International Exchange*, 12 J. MONEY, CREDIT & BANKING 513 (1980); Paul Krugman, *The International Role of the Dollar: Theory and Prospects*, in EXCHANGE RATE THEORY AND PRACTICE (1984); Kiminori Matsuyama et al., *Toward a Theory of International Currency*, 60 REV. ECON. STUD. 283 (1993); PHILIPP HARTMANN, CURRENCY COMPETITION AND FOREIGN EXCHANGE MARKETS: THE DOLLAR, THE YEN AND THE EURO (Cambridge Univ. Press, 1998); H el ene Rey, *International Trade and Currency Exchange*, 68 REV. ECON. STUD. 443 (2001); Swoboda, *supra* note 26. For an alternative perspective, see generally Livia Chitu et al., *When Did the Dollar Overtake Sterling as the Leading International Currency? Evidence from the Bond Markets* (Nat’l Bureau of Econ. Research, Working Paper No. 18097, 2012).

substitutes. We might expect these network effects to be particularly pronounced in the case of an international currency given that one of the most frequently cited intrinsic benefits—relatively low exchange rate volatility—is itself partly a function of the depth and volume of the market for the currency itself. Accordingly, even if public policymakers were able to surmount the political obstacles to the creation of an international currency, there would remain the sticky problem of how to attract private market participants away from the U.S. dollar and other major international currencies.²⁰⁸

Finally, the introduction of an international currency would throw up a host of technocratic policy challenges. One of the most important of these challenges would be how to coordinate the monetary policy of the IMA with the policies of signatory states. There would also be the challenge of ensuring that the introduction of an international currency was not itself a source of financial instability. As the ECB has warned, there may be significant “unintended consequences”²⁰⁹ associated with “replacing international currencies that have established themselves as a result of the autonomous decisions of private and official agents with a synthetic, policy-imposed, international currency.”²¹⁰ Given these challenges, the creation and widespread adoption of a new international currency seems both highly unlikely and potentially undesirable.

C. Reform of Existing Institutional Arrangements for FCLA

The third and final strategy is to strengthen existing international arrangements for the provision of FCLA. Two sets of

²⁰⁸ Thereafter, there would also be the problem of *maintaining* the currency’s attractiveness—with any failure to do so potentially precipitating a flight (back) to other currencies.

²⁰⁹ Ettore Dorrucci & Julie McKay, *The International Monetary System After the Financial Crisis*, OCCASIONAL PAPER SERIES (Eur. Cent. Bank, Frankfurt, Ger.), Feb. 2011, at 35.

²¹⁰ *Id.*

arrangements stand out as particularly promising and, simultaneously, ripe for potential reform.²¹¹ The first is the network of bilateral central bank swap lines established in response to the financial crisis. The first generation of swap lines established between the Federal Reserve and other central banks expired in February 2010.²¹² Within a matter of months, however, the deterioration of wholesale funding markets precipitated by the European sovereign debt crisis prompted the Fed to re-establish temporary swap lines with the ECB, SNB, Bank of England, Bank of Japan, and Bank of Canada.²¹³ In October 2013, the Fed announced that these temporary swap lines would be converted into *standing* facilities enabling any of the six central banks to borrow an unlimited amount of any of the currencies issued by the other participating central banks. As the Fed explained in its announcement:

The conversion of these liquidity lines with pre-set expiration dates to standing lines further supports financial stability by reducing uncertainties among

²¹¹ There are a number of other—predominantly *regional*—arrangements for the provision of FCLA. These include the Chiang Mai Multilateral Mechanism administered by the ASEAN group of countries. These arrangements are also potentially important and, arguably, in need of reform. The focus of this paper on the network of central bank swap lines and IMF emergency lending facilities reflects the potential impact of these arrangements at this point in time. The swap lines and IMF lending facilities are also unique insofar as they benefit from the direct participation of the United States as issuer of the world's most widely used reserve currency.

²¹² Press Release, Bd. of Governors of the Fed. Res. Sys., FOMC Statement (Jan. 27, 2010), <http://www.federalreserve.gov/newsevents/press/monetary/20100127a.htm> [perma.cc/G8K4-T2RN].

²¹³ Press Release, Bd. of Governors of the Fed. Res. Sys., FOMC Statement: Federal Reserve, European Central Bank, Bank of Canada, Bank of England, and Swiss National Bank Announce Reestablishment of Temporary U.S. Dollar Liquidity Swap Facilities (May 9, 2010), <https://www.federalreserve.gov/newsevents/press/monetary/20100509a.htm> [perma.cc/HDN8-6SJZ]; Press Release, Bd. of Governors of the Fed. Res. Sys., FOMC Statement: FOMC Authorizes Re-establishment of Temporary U.S. Dollar Liquidity Swap Arrangement with the Bank of Japan (May 10, 2010), <https://www.federalreserve.gov/newsevents/pressreleases/monetary20100510a.htm> [perma.cc/W562-9V73].

market participants as to whether and when these arrangements would be renewed. This action results from the ongoing cooperation among these central banks to help maintain financial stability and confidence in global funding markets.²¹⁴

What began as a somewhat ad hoc response to the financial crisis has thus rather quietly metamorphosized into an important—and seemingly permanent—feature of the global financial crisis management architecture.

The standing swap facilities announced in October 2013 are enshrined in a series of bilateral agreements between each of the participating central banks.²¹⁵ These agreements share several important features. The first is that the extension of FCLA under these agreements is highly contingent on domestic legal and political considerations. The wording of these agreements strongly suggests that swap transactions will only be approved and executed upon the mutual agreement of both parties at the time one of them actually requests FCLA.²¹⁶ The extension of FCLA must also be consistent with the statutory mandates of the relevant central banks. These requirements are in all likelihood linked; the contingent nature of the commitment is ultimately a reflection of the need to ensure that any given swap transaction falls squarely within the scope of the central bank's legal authority. Perhaps not sur-

²¹⁴ *Frequently Asked Questions: Standing Lines for U.S. Dollar and Foreign Currency Liquidity Swaps*, BD. OF GOVERNORS OF THE FED. RES. SYS., (Oct. 2013), https://www.federalreserve.gov/monetarypolicy/bst_swap_faqs.htm.

²¹⁵ The agreements among the Fed and participating central banks are available at *Central Bank Liquidity Swaps*, FED. RES. BANK OF N.Y., https://www.newyorkfed.org/markets/liquidity_swap.html [perma.cc/8JKM-L5GY].

²¹⁶ See e.g., U.S. Dollar-British Pounds Swap Agreement, FED. RES. BANK OF N.Y. (Jan. 16, 2014), https://www.newyorkfed.org/medialibrary/media/markets/USD_Pound_swap_agreement.pdf [perma.cc/2533-UWW3]. Section 1(c) of this agreement begins: “The Parties agree, *at such times as they mutually agree*, to enter into Swap Transactions . . .” (emphasis added).

prisingly, however, these mandates rarely make explicit reference to the promotion of monetary or financial stability *in other countries*.

In the United States, for example, the statutory authority of the Fed to enter into these swap transactions is provided by section 14 of the Federal Reserve Act.²¹⁷ Section 14 authorizes each of the twelve regional Federal Reserve banks to purchase and sell foreign currencies as a part of the Fed's open market operations.²¹⁸ While this might appear to give the Fed a wide berth, these transactions must still be consistent with its wider mandate to promote maximum employment, stable prices, and moderate long-term interest rates.²¹⁹ This mandate has been interpreted by senior Fed officials as implicitly encompassing the promotion of financial stability.²²⁰ Consistent with this interpretation, the Fed has signaled that

²¹⁷ Federal Reserve Act, 12 U.S.C. § 226 (1913).

²¹⁸ Section 14 of the Federal Reserve Act states: "Any Federal reserve bank may, under rules and regulations prescribed by the Board of Governors of the Federal Reserve System, purchase and sell in the open market, at home or abroad, either from or to domestic or foreign banks, firms, corporations, or individuals, *cable transfers*" (emphasis added). Written in 1913, the reference to "cable transfers" is in fact a reference to foreign currencies. Section 14(e), meanwhile, permits any Federal reserve bank to:

[O]pen and maintain accounts in foreign countries, appoint correspondents, and establish agencies in such countries wheresoever [sic] it may be deemed best for the purpose of purchasing, selling, and collecting bills of exchange, and to buy and sell, with or without its indorsement [sic], through such correspondents or agencies, bills of exchange (or acceptances) arising out of actual commercial transactions which have not more than ninety days to run... and... to open and maintain banking accounts for such foreign correspondents or agencies, or for foreign banks or bankers, or for foreign states. . . .

Federal Reserve Act, 12 U.S.C. § 358 (1913).

²¹⁹ See Federal Reserve Act, 12 U.S.C. § 2A (1913).

²²⁰ See *e.g.*, Tom Baxter, Exec. Vice President and Gen. Counsel of the Fed. Res. Bank of N.Y., Remarks at the Future of Banking Regulation and Supervision in the EU Conference, Frankfurt, Germany: Financial Stability: The Role of the Federal Reserve System (Nov. 15, 2013), <https://www.newyorkfed.org/newsevents/speeches/2013/bax131120> [perma.cc/J6TU-AL4X].

swap transactions under these facilities will generally be approved only where they are “directed at countering disorderly market conditions.”²²¹ The Fed has also produced a video, bluntly titled “Why Swap Lines are in the U.S. National Interest,” explaining how the facilities support investment, employment, and economic growth in the United States.²²² In light of these and other similar statements, it seems likely that swap transactions will only be approved where there is a clear and present danger to the financial stability of the jurisdiction that has received a request for FCLA.²²³ Where there exists no such threat, or where providing liquidity assistance to foreign financial institutions might prove politically costly, the structure of these agreements—to say nothing of the absence of a generally agreed upon definition of ‘financial stability’—gives participating central banks significant discretion to decline a request for FCLA.

The second important feature of these swap agreements is the complete absence of both *ex ante* qualifications for participating jurisdictions and *ex post* constraints on the extension of FCLA to eligible financial institutions. The Federal Reserve has ostensibly selected participating jurisdictions on the basis of its own evaluation of the potential threat that these jurisdictions pose to the financial stability of the United States.²²⁴

²²¹ *Minutes of the Federal Open Market Committee Meeting*, FED. RES. BANK N.Y. 6 (Jan. 28–29, 2014), <https://www.federalreserve.gov/monetary-policy/fomcminutes20140129.htm> [perma.cc/CJ9J-6LXD].

²²² *See Protecting the U.S. Economy from Strains Abroad—Why Swap Lines Are in the U.S. National Interest*, FED. RES. BANK N.Y. <https://www.newyorkfed.org/education/liqswap.html> [perma.cc/WN9K-PXB8].

²²³ *See* Denbee et al., *supra* note 51, at 11 (observing, “the scope of swap line liquidity provision is very narrow, and typically limited to facilitating market-wide liquidity provision to cross-border banks for the purposes of domestic financial stability”).

²²⁴ *See e.g., Meeting of the Federal Open Market Committee on October 28–29, 2008*, FED. RES. BANK N.Y. 10–11, 32–35 (Oct. 28–29 2008), <https://www.federalreserve.gov/monetarypolicy/files/FOMC20081029meeting.pdf> [perma.cc/4NZV-H736] (emphasizing the size of a country’s economy, its structural interconnectedness with the global financial system, and whether it is a major financial center as important factors in determining

While this approach is broadly understandable, the absence of more formal and objective *ex ante* qualifications has also resulted in at least one questionable inclusion (Canada) and one glaring omission (China). For participating jurisdictions, meanwhile, the swap agreements do not impose any limits around the types of financial institutions to which recipient central banks can supply foreign currency funding. Nor do these agreements in any way dictate the terms upon which this funding will be made available to these institutions. Perhaps most importantly, the agreements do not prescribe that FCLA be provided against good quality collateral, at a penalty rate of interest, and only to fundamentally solvent but temporarily illiquid banks and other financial institutions.

Central banks in receipt of FCLA are also under no obligation to ensure that the prudential regulatory requirements imposed on eligible financial institutions are functionally equivalent to those imposed on financial institutions in the jurisdiction that provides this assistance. While some observers have argued that the BCBS capital and liquidity standards ensure a sufficient degree of regulatory and supervisory harmonization, the implementation of these standards varies from country to country. There are also signs that the Basel consensus is beginning to fray around the edges, with the European Union having recently been determined by the BIS to be in material non-compliance with Basel standards.²²⁵ The absence of *ex ante* qualifications and *ex post* constraints thus introduces the prospect that FCLA may in some cases be available to a wider range of financial institutions, on more

whether to extend swap lines to Brazil, Singapore, Mexico, Korea, and Iceland).

²²⁵ See *RCAP on Consistency: Jurisdictional Assessments*, BANK FOR INT'L SETTLEMENTS, http://www.bis.org/bcbs/implementation/rcap_jurisdictional.htm [perma.cc/Q8SQ-M3G7]. See also Silla Brush et al., *Bank Regulators Face Santiago Showdown on Capital Reform*, BLOOMBERG (Nov. 17, 2016, 7:01 PM), <https://www.bloomberg.com/news/articles/2016-11-18/bank-regulators-stare-across-capital-divide-in-santiago-showdown> [perma.cc/P5XE-AQCV]; Alex Barker, Jim Brunnsden, & Martin Arnold, *EU to Retaliate Against US Bank Capital Rules*, FIN. TIMES (Nov. 21, 2016), <https://www.ft.com/content/26078750-b003-11e6-a37c-f4a01f1b0fa1>.

favorable terms, and subject to less onerous regulatory constraints, than in the jurisdiction that actually issues the relevant currency.

Closely tied to the absence of qualifications and conditions is the contemplated fee structure of the swap transactions. There are at least two ways to view the economic function of the standing facilities. The first is as a *line of credit*. Unlike most privately negotiated lines of credit,²²⁶ however, central banks with access to the swap lines are not charged a ‘commitment fee’ in exchange for the option of obtaining FCLA. Instead, central banks accessing this liquidity support are simply charged interest on any outstanding balance. This interest is calculated on the basis of a spread above a benchmark short-term interest rate such as the overnight index swap (“OIS”) rate.²²⁷ While comprehensive data is not available, the reported spreads on swap transactions under the temporary swap lines in operation between 2007 and 2013 ranged from 50–100 basis points (0.5–1.0%) above the OIS rate.²²⁸

The second way to view the facilities is as a form of *insurance* against currency-specific liquidity problems. Notably, however, there is no evidence that the methodology for calculating interest reflects the value of this insurance to participating central banks on the basis of, for example, the outstanding stock of the relevant currency, its use by financial institutions within the relevant jurisdiction, or the probability of a market wide currency-specific liquidity shortage. As the Bank of England has observed, the swap transactions are instead priced “at a cost which is not attractive during normal

²²⁶ And, as this Article shall discuss, the IMF’s new emergency lending facilities.

²²⁷ See e.g., U.S. Dollar-British Pounds Swap Agreement, *supra* note 216, § 4(c).

²²⁸ *Experience with Foreign Currency Liquidity Providing Central Bank Swaps*, MONTHLY BULL. (Eur. Cent. Bank, Frankfurt, Ger.), Aug. 2014, at 73, 65–82; Denbee et al., *supra* note 51, at 12.

periods, but is not prohibitively expensive during crisis periods.”²²⁹ Whichever view one adopts, it thus seems highly probable that the current fee structure of the standing facilities will result in significant underpricing of FCLA.

The final feature relates to the contemplated term structure of the swap transactions. The agreements state that each swap will have a maximum maturity of eighty-eight days, or such other period as may be mutually agreed by the parties.²³⁰ However, in the event that one of the parties fails to repurchase its currency on or before the relevant maturity date, the swap transaction automatically rolls over into a new overnight swap transaction.²³¹ The amount owing under the maturing swap is then cancelled and replaced with this rollover swap transaction, which for the purposes of the agreements is expressly deemed to be equivalent to a newly entered-into swap transaction.²³² As a result, should the party also fail to repurchase its currency upon the maturity of a rollover swap transaction, the swap will once again automatically rollover. In theory, therefore, these swap transactions could roll over in perpetuity.²³³

These features reveal two critical flaws in the design of the standing facilities. The first is the complete absence of mechanisms designed to constrain the potentially significant moral hazard problems generated by the theoretically open-ended, underpriced provision of FCLA. In the absence of such mechanisms, participating central banks may come to expect that they will be able to acquire foreign currency under these facilities at any time and on favorable terms—thereby undercutting their incentives to strictly regulate the issuance of short-

²²⁹ Denbee et al., *supra* note 51, at 11.

²³⁰ See, e.g., U.S. Dollar-British Pounds Swap Agreement, *supra* note 216, § 1(c).

²³¹ *Id.* § 6(a).

²³² *Id.*

²³³ While the party providing FCLA under the swap is authorized to set off any obligations it owes against the corresponding currency purchased from the other party, *id.* § 6(b), one might expect this right to be exercised in only the most extraordinary of circumstances given the potential political ramifications of exercising this option.

term foreign currency liabilities by domestic financial institutions or proactively manage the risk of foreign currency liquidity problems. These financial institutions, in turn, may maintain—or even *increase*—their short-term foreign currency borrowing with the expectation that the central bank will step in to provide FCLA during periods of widespread market disruption. In this important respect, the incomplete institution-alization of FCLA under the standing facilities may actually serve to foment potential financial instability.

The second flaw resides in the politically contingent nature of the standing facilities. Some view this flaw as necessary to ensure that participating central banks are not *ex ante* committed to provide FCLA in circumstances that would fall outside the scope of their statutory authority.²³⁴ Some even view it as desirable insofar as it introduces a degree of constructive ambiguity, thereby helping to ameliorate potential moral hazard problems.²³⁵ Ultimately, however—and irrespective of whether we view it as a ‘feature’ or a ‘bug’—the contingent nature of the facilities generates two potentially significant distortions. First, one might expect both participating central banks and the financial institutions under their oversight to respond to any uncertainty around their access to the facilities by expanding their foreign currency assets and liabilities and, more generally, by increasing their levels of integration and interconnectedness with the financial systems and real economies in other participating jurisdictions. By doing so, these central banks and financial institutions would seek to increase the likelihood that any domestic instability would spill over into other participating jurisdictions, thereby maximizing the probability that these jurisdictions would deem it in their economic best interests to provide FCLA. Second, the politically contingent nature of the facilities opens the door to decisions regarding access to foreign currency liquidity that are motivated by domestic political and other considerations. As the history of financial crises clearly demonstrates, these

²³⁴ See, e.g., Eur. Cent. Bank, *supra* note 228, at 37.

²³⁵ *Id.* at 82.

decisions often come into conflict with the objective of promoting global financial stability.²³⁶

The question thus becomes how to make the standing facilities more credible and effective sources of FCLA. The first step would be to place access to the standing facilities on more certain legal footing. Some observers have gone as far as suggesting that the mandate of the Federal Reserve should be formally amended to reflect its de facto role as global lender of last resort.²³⁷ A related, and ultimately complementary, proposal would be to introduce formal, binding, *ex ante* qualifications for jurisdictions seeking access to FCLA. These qualifications could reflect the size of a jurisdiction's domestic economy, its structural interconnectedness with the global financial system, whether it was a major international financial center, and whether it otherwise posed a threat to the financial stability of the jurisdiction providing FCLA.²³⁸ Once qualified, the extension of FCLA to these jurisdictions could then be made contingent on observable and objective metrics of market disruption or financial instability. Potentially useful metrics include basis swap spreads (which, as we have seen, are a barometer for foreign currency funding pressures) and the LIBOR-OIS spread (a key barometer of perceptions of counterparty credit risk within wholesale funding markets). Where these spreads exceed specified thresholds, this could be

²³⁶ For examples from the 1920s and 1930s, see LIAQUAT AHAMED, *LORDS OF FINANCE: THE BANKERS WHO BROKE THE WORLD* (2009). Over its history, even the Federal Reserve has not been immune to oscillations in its approach towards the maintenance of international financial stability. See Peter Conti-Brown & David Zaring, *Foreign Affairs and the Federal Reserve*, (American Soc'y of Int'l Law Int'l Econ. Law, Working Paper, 2016) (on file with author) (describing the Fed's oscillation between a "cosmopolitan" and "isolationist" approach to foreign affairs).

²³⁷ See STEIL & HINDS, *supra* note 10, at 246 ("The best hope for salvaging financial globalization, then, is a renewed statutory framework for the Fed, one which explicitly acknowledges the global role of the dollar and the dependence of the U.S. economy on foreign confidence in it.").

²³⁸ These factors were notably taken into consideration by the Federal Open Market Committee in determining which jurisdictions would receive central bank swap lines during the crisis. See *Minutes of the Federal Open Market Committee Meeting*, *supra* note 224, at 10.

deemed to constitute evidence of financial instability, thereby enabling the Fed and other participating central banks to extend FCLA in accordance with their statutory mandates.

In exchange for this more certain commitment to provide FCLA, the second step would be to require qualifying jurisdictions to agree to a binding framework governing the terms upon which FCLA would be extended to domestic banks and other financial institutions. The framework could articulate, for example, which types of financial institutions would be eligible to receive FCLA, the categories of collateral that could be pledged, and the haircuts imposed on each category of collateral. Qualifying jurisdictions could also undertake to ensure that short-term foreign currency liabilities issued by domestic financial institutions were subject to the same reserve ratios as the equivalent liabilities in the jurisdiction that issued the relevant currency. They could also agree to impose currency-specific liquidity coverage ratios designed to ensure that domestic financial institutions held a sufficient stock of high quality liquid assets denominated in the relevant currency to be able to meet expected outflows in the event of a hypothetical thirty-day stress scenario.²³⁹ The primary thrust of these requirements would be to eliminate the distortions created by substantive differences in ELA and prudential regulatory regimes across jurisdictions, constrain the build-up of foreign currency mismatches, and alleviate the pressure on financial institutions to sell foreign currency assets during periods of market disruption.²⁴⁰

The third step would be to introduce a fee structure that better reflected the role of the standing facilities as a form of liquidity insurance. The role of FCLA as a form of insurance

²³⁹ Indeed, the European Systemic Risk Board has encouraged the competent authorities within EU member states to monitor liquidity risks associated with foreign currency assets and liabilities. See Recommendation of the European Systemic Risk Board of 22 December 2011 on US Dollar Denominated Funding of Credit Institutions, 2011 O.J. (C 72) 1, 2.

²⁴⁰ See Jeremy C. Stein, Member, Bd. of Governors of the Fed. Reserve Sys., Remarks at the Global Research Forum, Int'l Finance and Macroeconomics: Dollar Funding and Global Banks (Dec. 17, 2012); Denbee et al., *supra* note 51, at 25.

suggests that all qualifying jurisdictions should be required to pay an ongoing fee—a *premium*—irrespective of whether they actually draw down on the facilities. This premium would theoretically need to reflect the use of the relevant currency within the domestic economy of a qualifying jurisdiction, the level and proportion of short-term foreign currency funding within its domestic financial system, and any pronounced foreign currency mismatches on the balance sheets of domestic banks and other financial institutions. It would also need to reflect any other forms of (self-)insurance—e.g., the accumulation of foreign exchange reserves—undertaken by a qualifying jurisdiction for the purpose of insulating the domestic financial system from foreign currency liquidity problems. While accurately pricing this type of insurance is notoriously difficult, some reasonable attempt at doing so is ultimately necessary in order to constrain the moral hazard problems stemming from the underpriced provision of FCLA under the current standing facilities.

Finally, the standing facilities would need to be augmented by binding commitments on the part of qualifying jurisdictions to share data relating to foreign currency assets and liabilities within their domestic financial systems. This data sharing would be vital for the purposes of both monitoring compliance with *ex ante* qualifications and *ex post* constraints and calculating the requisite liquidity insurance premiums. More generally, enhanced data sharing would also enable more effective macroprudential surveillance—especially with respect to cross-border capital flows and the build-up of potentially destabilizing foreign exchange imbalances on the balance sheets of banks and other financial institutions.²⁴¹

The second set of arrangements for the provision of FCLA are two emergency lending facilities recently introduced by the IMF. Established in 1945, the IMF is an international reserve fund originally designed to provide short-term loans to assist member countries facing actual or potential balance of

²⁴¹ FARHI ET AL., *supra* note 195, at 48.

payments problems.²⁴² IMF member countries are required to make contributions to the fund based on a quota formula that takes into account each country's gross domestic product ("GDP"), the openness and variability of its economy, and accumulated foreign exchange reserves.²⁴³ The IMF then uses these funds to make loans to member countries under various lending facilities.²⁴⁴ The IMF also conducts surveillance of the international monetary system, along with the fiscal, monetary, and financial sector policies of each of its 189 member countries.²⁴⁵ Following the collapse of the Bretton Woods fixed exchange rate regime in the early 1970s, the IMF has attempted to reinvent itself as an international financial crisis "firefighter."²⁴⁶ Perhaps most notably, the IMF has played an important role in coordinating the international response to the emerging market debt crisis of the early 1980s²⁴⁷, the

²⁴² For an overview of the IMF's role, see *The IMF at a Glance*, IMF (Apr. 20, 2017), <http://www.imf.org/en/About/Factsheets/IMF-at-a-Glance> [perma.cc/DH9D-ETRB]. For a more detailed description of its activities, see *Annual Report of the Executive Board*, IMF, <http://www.imf.org/external/pubs/ft/ar/index.htm> [perma.cc/8CU5-WXEV].

²⁴³ For further details, see *Report of the Executive Board to the Board of Governors on the Reform of Quota and Voice in the International Monetary Fund*, IMF (Mar. 28, 2008), <https://www.imf.org/external/np/pp/eng/2008/032108.pdf> [perma.cc/Q8SY-S67T].

²⁴⁴ For a complete list of IMF lending facilities, see *IMF Lending*, IMF (Oct. 11, 2017), <http://www.imf.org/en/About/Factsheets/IMF-Lending> [perma.cc/8FM7-8RFH].

²⁴⁵ Alongside this surveillance, the IMF also provides technical assistance to member countries in relation to various aspects of economic policy. *Id.* For a useful description of the IMF's role within the broader context of the global financial and regulatory architecture, see generally Chris Brummer, *How International Financial Law Works (And How It Doesn't)*, 99 GEO. L.J. 257 (2011).

²⁴⁶ See *Wanted: Chief Firefighter*, THE ECONOMIST (June 2, 2011), <http://www.economist.com/node/18772058> [perma.cc/5GYG-SBXF].

²⁴⁷ See James M. Boughton, *From Suez to Tequila: The IMF as Crisis Manager* 17–18 (IMF, Working Paper No. 97/90, 1997), <https://www.imf.org/external/pubs/ft/wp/wp9790.pdf> [perma.cc/9NQL-KLBB].

Asian financial crisis of 1997–1998²⁴⁸ and, more recently, the rescues of Ireland, Greece, Portugal, and Cyprus during the European sovereign debt crisis.²⁴⁹

Historically, the IMF has not been an important source of FCLA. However, spurred by the global financial crisis, the IMF has recently introduced two new emergency lending facilities: the Flexible Credit Line (the “FCL”) and the Precautionary and Liquidity Line (the “PLL”).²⁵⁰ Introduced in March 2009, the FCL is designed to provide emergency liquidity assistance to member countries exhibiting strong economic fundamentals and policy frameworks.²⁵¹ A member country’s access to the FCL is subject to certain *ex ante* qualifications based on its external and capital account position, access to international sovereign debt markets, the health of its public finances, the effectiveness of financial sector supervision, and other factors.²⁵² Once qualified, member countries are entitled

²⁴⁸ See IMF, RECOVERY FROM THE ASIAN CRISIS AND THE ROLE OF THE IMF (2000).

²⁴⁹ For a summary of the IMF’s recent activities in Europe, see *The IMF and Europe*, IMF (Mar. 23, 2016), <http://www.imf.org/external/np/exr/facts/europe.htm> [perma.cc/6EJD-2RGQ].

²⁵⁰ The FCL and PLL are not the IMF’s first attempt to introduce emergency liquidity facilities. Previous (failed) attempts have included the Contingent Credit Line (launched in 1999) and the Short-Term Liquidity Facility (launched in 2008). For a summary of the development of, and debates surrounding, these earlier initiatives, see generally Roberto Marino & Ulrich Volz, *A Critical Review of the IMF’s Tools for Crisis Prevention* (Ger. Dev. Inst., Paper No. 4/2012, 2012). The IMF has also recently introduced the Rapid Financing Instrument (“RFI”) for member countries facing urgent balance of payment problems; see *The IMF’s Rapid Financing Instrument (RFI)*, IMF (Oct. 13, 2017), <http://www.imf.org/en/About/Factsheets/Sheets/2016/08/02/19/55/Rapid-Financing-Instrument> [perma.cc/Y6ZX-AZP6]. However, RFI loans are capped at 37.5% of a member country’s quota on an annual basis and 75% on a cumulative basis. RFI loans are also subject to same terms as the FCL and PLL. *Id.*

²⁵¹ See *The IMF’s Flexible Credit Line (FCL)*, IMF (Oct. 5, 2017), <http://www.imf.org/en/About/Factsheets/Sheets/2016/08/01/20/40/Flexible-Credit-Line> [perma.cc/89MW-6U8P].

²⁵² *Id.* At the same time, the IMF has signaled that member countries do not need to show strong performance against all these criteria. See IMF, THE FLEXIBLE CREDIT LINE—GUIDANCE ON OPERATIONAL ISSUES (2009),

to draw on the FCL at any time during the term of the facility without the need to satisfy further conditions. The amount that member countries can borrow is theoretically unlimited, but ultimately subject to the general constraints on the IMF's financial resources. Member countries that qualify for access to the FCL must pay a commitment fee and, when drawn upon, an interest rate that varies with the amount borrowed and the time that borrowed funds remain outstanding.²⁵³ To date, the only countries that have applied for access to the FCL are Mexico, Poland, and Colombia—with none of these countries having thus far drawn down under this new facility.

Introduced in November 2011, the PLL is designed to provide emergency liquidity assistance to member countries that do not meet the *ex ante* qualifications for access to the FCL.²⁵⁴ In addition to meeting a less stringent set of qualifications, member countries borrowing under the PLL are subject to *ex post* conditions reflecting the IMF's assessment of their potential vulnerabilities.²⁵⁵ Compliance with these conditions is then monitored and assessed by the IMF Executive Board on a semi-annual basis. Once qualified, member countries can borrow up to 250% of their quota per year, depending on the duration of the loan and the source and severity of the economic shock precipitating the need for emergency liquidity assistance.²⁵⁶ Qualified countries must pay a commitment fee, plus interest and service charges on any drawn amounts.²⁵⁷

<http://www.imf.org/external/np/pp/eng/2009/110209.pdf> [perma.cc/35CV-KXX3].

²⁵³ Drawn amounts are also subject to a service charge of fifty basis points. For a more detailed description of the methodology for calculating the commitment fee, interest rate, and service charge, see *The IMF's Flexible Credit Line (FCL)*, *supra* note 251.

²⁵⁴ The PLL replaced the Precautionary Credit Line introduced in August 2010. See *The IMF's Precautionary and Liquidity Line (PLL)*, IMF (Oct. 10, 2017), <http://www.imf.org/en/About/Factsheets/Sheets/2016/08/01/20/45/Precautionary-and-Liquidity-Line> [perma.cc/K9QK-5FP2].

²⁵⁵ *Id.*

²⁵⁶ *Id.*

²⁵⁷ *Id.*

To date, the only countries to have applied for access to the PLL are Macedonia and Morocco.²⁵⁸

While still essentially untested, the FCL and PLL represent an important step in the development of a credible multilateral mechanism for the provision of FCLA. Perhaps most importantly, the design of these facilities reflects a discernable shift in the IMF's focus from financial crisis firefighting toward meaningful fire *prevention*. This shift is most clearly reflected in the FCL's utilization of *ex ante* qualifications as opposed to *ex post* conditionality. The use of *ex ante* qualifications injects a degree of certainty from the perspective of potential creditor countries that they will have immediate and unconditional access to the facility in the event of an emergency. The absence of *ex post* conditionality also eliminates an important source of potential procedural obstacles to the rapid extension of FCLA.

While the introduction of these facilities is undoubtedly a positive development, the FCL and PLL are still a far cry from representing a truly credible framework for the provision of FCLA. First, only five countries—together representing less than 3% of global GDP—have thus far applied for access to these facilities.²⁵⁹ Second, unlike conventional ELA facilities, any loans ultimately extended under the FCL and PLL will not be collateralized against the assets of either the borrowing countries or the financial institutions that ultimately receive FCLA. This is likely to exacerbate potential moral hazard problems and leaves the IMF member countries that provide financing under these facilities exposed to potentially significant losses in the event of default.

Third, and perhaps most importantly, the financial resources currently available under the FCL and PLL may simply be too small to mount an effective full-scale response to a systemic foreign currency liquidity crisis. As of March 2017, IMF quotas totaled approximately \$USD645 billion.²⁶⁰

²⁵⁸ *Id.*

²⁵⁹ See *The IMF's Flexible Credit Line (FCL)*, *supra* note 251; *The IMF's Precautionary and Liquidity Line (PLL)*, *supra* note 254.

²⁶⁰ See *The IMF at a Glance*, *supra* note 242.

Subject to the approval of member countries representing at least 85% of the fund's resources, the IMF can also borrow up to \$USD250 billion from member countries under an existing multilateral facility known as the 'New Arrangements to Borrow' (the "NAB"). However, with 17.47% of the IMF's total quota (and 16.54% of the voting rights of the Board of Governors), this threshold notably gives the United States a de facto veto over the use of the NAB.²⁶¹ Furthermore, it is not clear whether any countries other than the United States would be in a position to lend the IMF U.S. dollars in the middle of a global liquidity crisis. After subtracting current commitments of approximately \$USD159 billion, a conservative estimate thus leaves the IMF with just over \$USD500 billion of dry powder theoretically available in response to an emerging global crisis. Yet only a small fraction of this \$USD500 billion—approximately \$USD102.6 billion as of January 31, 2017—is comprised of the U.S. dollars that are likely to be most in demand in the thick of any such crisis.²⁶² By way of comparison, it worth remembering that U.S. dollar lending under the swap lines between the Federal Reserve and other major central banks peaked at \$USD586 billion in December 2008. By almost any measure, the IMF is thus not in a position to comply with the imperative of Bagehot's dictum to lend freely in response to widespread panic and financial instability.

²⁶¹ When the requisite 85% supermajority does not approve a proposal to activate the NAB, the IMF can still borrow under the 'General Agreements to Borrow' ("GAB"). As of April 2017, the IMF was entitled to borrow up to approximately \$USD23 billion under the GAB. *IMF Standing Borrowing Arrangements*, IMF (Apr. 2017), <http://www.imf.org/en/About/Factsheets/Sheets/2016/08/05/17/55/IMF-Standing-Borrowing-Arrangements> [perma.cc/YY4F-QLRW].

²⁶² Figure calculated on the basis of the U.S. total of the IMF's currency holdings (75,480.9 million SDR) multiplied by the notional SDR-USD exchange rate as of January 31, 2017 (1.358830). See IMF, FINANCIAL STATEMENTS FOR THE QUARTERS ENDED JANUARY 31, 2017, AND 2016 (2017), <http://www.imf.org/External/Pubs/FT/quarter/2017fy/013117.pdf> [perma.cc/PEM4-SRMX]; *Currency Units per SDR for January 2017*, IMF, https://www.imf.org/external/np/fin/data/rms_mth.aspx?SelectDate=2017-01-31&reportType=CVSDR [perma.cc/ETY9-JHQ2].

Given these resource constraints, Emmanuel Farhi, Pierre-Olivier Gourinchas, and Hélène Rey propose granting the IMF the right to borrow from national treasuries and central banks and to raise capital on international bond markets.²⁶³ In order to address the moral hazard problems associated with the FCL's use of *ex ante* qualifications (and the absence of *ex post* conditionality), they also propose subjecting borrowers to ongoing monitoring of private sector foreign exchange imbalances over the term of any loan. Both of these proposals seem prudent. Ultimately, however, the effectiveness of these proposals hinges on the IMF using its new powers proactively to raise capital under normal market conditions rather than waiting for a global liquidity crisis to appear on the horizon.²⁶⁴ Moreover, as Farhi, Gourinchas, and Rey concede, these reforms would likely need to be considered as a part of a far broader discussion regarding the governance of the IMF.²⁶⁵ At least for the moment, this discussion does not appear to be high on the IMF's agenda. In the absence of an external catalyst, the FCL and PLL are thus likely to remain incomplete and imperfect arrangements for the provision of FCLA.

Are the proposed reforms to either the central bank swap lines or the IMF's new emergency lending facilities feasible in the current political climate? Perhaps not. Indeed, engendering widespread political support for these reforms may prove especially challenging precisely because they envision the widening and deepening of the international financial safety net. Nevertheless, the vagaries of domestic and international politics do not detract from the reality that there are no free lunches in global finance, and that the drive for deeper economic and financial integration will eventually need to be matched by more credible and effective commitments in the realm of international financial policy, regulation, and crisis

²⁶³ FARHI ET AL., *supra* note 195, at 41.

²⁶⁴ By definition, raising capital in these circumstances would be more expensive or, potentially, impossible. *See supra* Section III.B.

²⁶⁵ FARHI ET AL., *supra* note 195, at 43.

management. Until they are prepared to make these commitments, policymakers will continue to face a choice between autarky and the instability generated by foreign currency liquidity crises.

VI. CONCLUSION

There are a great many lessons from the global financial crisis. This Article has identified some of the key lessons from an extremely important but relatively unexamined episode from the crisis: the international U.S. dollar liquidity shortage that began in December 2007 and reached its apex in September and October 2008. Two lessons stand out. The first is that the widespread issuance of short-term foreign currency liabilities by banks and other financial institutions should be viewed as a form of private money creation that poses a grave threat to financial stability. The second is that, within a globally integrated financial and economic system, there are significant practical constraints on the ability of sovereign states to effectively respond to this threat.

It is perhaps tempting to view the network of central bank swap lines established during the financial crisis, along with the IMF's new emergency lending facilities, as evidence that society has learned the important lessons from this episode. However, while there is little doubt that the swap lines played a critical role in stabilizing the financial system at the height of the crisis, their current design gives rise to significant distortions, thereby undermining their likely effectiveness as a comprehensive and durable solution to foreign currency liquidity problems. The new IMF emergency lending facilities, meanwhile, though undoubtedly a constructive step toward a viable multilateral facility for the provision of FCLA, are also far from perfect and remain essentially untested.

This Article has sketched out a blueprint for how one might improve the effectiveness of this emerging international architecture for the provision of FCLA. This blueprint hinges on strengthening the credibility of the commitments underpinning FCLA, eliminating the distortions associated with the underpriced provision of liquidity insurance under the current facilities, and enhancing cross-border data sharing and

macroprudential surveillance arrangements. While largely incremental, these reforms could serve to dramatically reduce the prospect of widespread financial instability stemming from foreign currency liquidity problems.

Lastly, this Article has raised a host of important and—at least for the moment—unanswered questions. Paramount amongst these questions is how well the current patchwork architecture for the provision of FCLA will perform during the next global financial crisis. While there is reason for cautious optimism, there is also enormous scope for political interference, coordination problems, and policy failure. From an empirical perspective, other important questions include whether and how the current architecture might serve to distort international capital flows, along with how these distortions might contribute to foreign exchange imbalances or foment potential financial instability. From a policy perspective, important questions then include whether these distortions are best addressed through the development of bilateral arrangements such as central bank swap lines or multilateral arrangements such as the IMF's emergency lending facilities. The answers to these questions remain to be explored in subsequent work and, ultimately, will play an important role in building a more sustainable international financial system.