SWIFT INSTITUTE

SWIFT INSTITUTE WORKING PAPER NO. 2013-001

Theory of Optimum Financial Areas:
Retooling the Debate on the Governance of Global Finance

ERIK JONES
(THE JOHNS HOPKINS UNIVERSITY SAIS AND NUFFIELD COLLEGE)

GEOFFREY UNDERHILL
(UNIVERSITY OF AMSTERDAM AND SAIS EUROPE)

PUBLICATION DATE: 24 NOVEMBER 2014

The Theory of Optimum Financial Areas:
Retooling the debate on the governance of global finance

Erik Jones[1] and Geoffrey R.D. Underhill[2]

ABSTRACT: This article examines the institutional preconditions for stable financial integration in a 'theory of optimal financial areas' (OFA). This theory is modelled on the theory of optimal currency areas that has been used to inform the process of monetary integration. Where it differs from optimum currency area (OCA) theory is in focussing on capital mobility and cross-border financial transactions rather than concentrating on exchange rates or macroeconomic adjustment. We contend that OCA theory misdirects both the analysis and the policy response: it is more pertinent to ask what makes for financial stability under conditions of market integration than what makes for stable currencies and smooth macroeconomic adjustment. The article proposes six 'criteria' that should be met in order to stabilize an integrated financial 'market geography'. Three of these criteria relate to the technical substructure of markets, and include a shared risk free asset, centralized sovereign debt management, and common market infrastructures for communication, clearing, settlement and depository. Three further criteria focus on the macro-prudential considerations like shared rules for financial supervision, centralized lender of last resort facilities for private- and public-sector market participants, and common provision for the resolution of failed private- and public-sector borrowers. These criteria are controversial both individually and as an interdependent package. Nevertheless, they are important to mitigate the costly dynamics of financial market disintegration under crisis conditions. We use case studies of the Great Britain, the United States and Canada to show how national governments have stumbled toward a similar set of arrangements to stabilize domestic financial market integration. The more recent experience of the European Union shows this pattern applies across countries as well. We conclude with a research agenda based on these considerations.

Keywords: euro area; financial stability; financial integration; monetary union; financial governance; financial markets; capital mobility

[1] Professor of European Studies; Director of European and Eurasian Studies; Director of the Bologna Institute for Policy Research, the Paul H. Nitze School for Advanced International Studies, The Johns Hopkins University, Bologna, Italy and Washington, DC; Senior Research Fellow, Nuffield College, Oxford, United Kingdom.
[2] Professor of International Governance, Department of Political Science and Director of the Political Economy and Transnational Governance research programme, Amsterdam Institute for Social Science Research, Universiteit van Amsterdam, The Netherlands.

The Theory of Optimum Financial Areas:
Retooling the debate on the governance of global finance

Erik Jones and Geoffrey Underhill[1]

This article develops a theoretical framework for examining the preconditions for stable financial market integration both within and across national economies. The approach builds upon the contribution of the theory of Optimum Currency Areas (OCA) to our understanding of the geography of money. However, we contend that OCA theory misdiagnoses the problem and therefore leads to a policy framework that fails to provide the conditions for financial stability. Instead of setting out the requirements for stable monetary integration, our approach refocuses the analysis on the requirements for the stable integration of financial markets. Specifically, we analyse the institutions that can be used to prevent a costly disintegration of financial markets that have grown together as a result of public policy and private actors. In this way, we use OCA theory as a model to analyse a financial market geography that is different from the geography of money.[2]

This change in perspective from money to finance has important implications for our understanding of growth, development, and the legitimacy of an open economy. The debate about currency integration arose from a concern with the dynamics of macroeconomic adjustment. Proponents of monetary integration expressed a desire to enhance transactional efficiency and to maximize macroeconomic policy autonomy either in the service of Keynesian-style aggregate demand management or through the expansion of an area of macroeconomic stability. Optimum Currency Area theory asks questions that are relevant to these objectives: Under what conditions might a monetary union prove beneficial to particular national economies, and what problems might result of the choice of exchange rate regime? How can (national) economic units best survive the pressures of adjustment that arise from the imbalances inherent in any particular monetary space? In addressing these questions, OCA theory provides us with crucial guidance on how to deal with current account imbalances and other aspects of macroeconomic adjustment that inevitably follow from the fusion of 'separate' national currencies into a monetary union.

[1] This work was conceived originally with the support and contribution of two very talented PhD students at SAIS – Gregory W. Fuller and Neil Shenai. Along the way, it has benefited from the generous feedback of a large number of individuals, including Usama Delorenzo, Jeffry Frieden, Iain Hardie, Madeleine Hosli, Somchai Lertlarpwasin, Marshall Millsap, Michael Plummer, Beth Smits, Masayuki Tagai, Wanwisa Vorranikulkij, and participants in the "Banking and Financial Regulation" workshop held at the Josef Korbel School of International Studies, University of Denver, 15-17 May 2014. The authors wish to acknowledge the enthusiasm, advice and funding of the SWIFT Institute in supporting this research and the funding of the Socio-Economic Sciences and Humanities theme of the European Commission's 7th Framework research programme GR:EEN project (Global Re-ordering: Evolution through European Networks, Grant agreement no. 266809). Feedback from members of the SWIFT Institute Advisory Board was particularly useful in shaping our argument. The research findings and opinions of the authors as well as any errors or omissions remain theirs alone.

[2] We use the term 'model' here in the heuristic sense and not in the formal sense. The OCA literature provides the example upon which we base our own contribution to the literature.

The debate about financial integration has parallel and yet different aspirations. It stems from the desire to improve the allocation of capital and to relax the constraints on the balance of payments. In this context, it poses different questions: Under what conditions can economies reap the benefits of financial integration and capital mobility without becoming exposed to the costs of financial crises and a subsequent reversal of the integration process itself? How can policymakers encourage investors to discriminate between good and bad counterparties rather than engaging in a more generalized flight to safety, generating significant instability in the process? More broadly, how can policymakers prevent the tensions that arise within or across national economies from tearing the financial marketplace apart? By answering these questions, a theory of optimum financial areas (OFA) sheds light on how policy makers can foster the advantages of financial market integration while minimizing the risk that market panic will bring all or part of the integrated financial area to a 'sudden stop'.[3]

The distinction between the OCA theory we use as a model and the OFA theory we are proposing should not be overdrawn. As our case studies demonstrate, the geography of money and the geography of finance overlap in important ways. Financial flows can play a role in macroeconomic adjustment and in the stabilization of the balance of payments; monetary and exchange rate policy can have an influence on the dynamics of financial markets. Moreover, the processes of monetary and financial integration are mutually reinforcing – with implications that are both good and bad. Governments that seek to maximize the growth prospects for their national economies may, under the right conditions, have an interest in pursuing both agendas. The challenge is that any failure on one side – the monetary or the financial – tends to efface progress made on the other.

Despite the complementarities, however, an optimal currency area and an optimal financial area are not the same – any more than monetary policy is the same as banking supervision or macro-prudential oversight. Moreover, as Jerry Cohen has underscored, the geography of money (and so also the geography of finance) does not correspond with policy domains either.[4] Therefore it is important to analyse the problems associated with financial market integration separately from the problems of choosing an appropriate exchange rate regime even if the challenges are similar and inter-related.

The article has five parts. The first section explains how the European financial crisis justifies a reconsideration of the theory of optimum currency areas. Although commentators have been quick to diagnose the crisis as a consequence of monetary integration, the underlying causal mechanisms

[3] Calvo 1998.
[4] Cohen 1998.

do not fit the standard patterns anticipated in OCA theory. On the contrary, the patterns of causality seem to be financial rather than monetary in origin and their influence extends well beyond Europe's monetary union. Rather than seeking to redesign the euro as a single currency, policymakers should focus on enhancing the stability of European financial market integration.

The second section elaborates on what we mean by the notion of stability. The stability that interests us is not the elimination of financial market dynamics or cycles in economic performance. Nor do we imply that financial institutions should never fail. Rather, the goal is to prevent the failure of one or a few institutions from becoming a failure of the integrated financial area as a whole. We therefore use the term 'stability' in relation to 'integration' and not 'currency', 'finance', or 'markets'.

The third section makes the case for six institutional arrangements (or 'criteria') that mitigate the forces that drive financial market disintegration. Again, the volatility that concerns us is not the up and down movement in prices and volumes but rather the withdrawal of capital and the breakup of markets. The criteria are:

i) a common risk-free asset (currency and debt instruments) to use as collateral for liquidity access and clearing as well as a refuge for capital 'fleeing to quality' in times of distress;
ii) a central system of sovereign debt management;
iii) centralized counterparties such as exchanges, clearing agents, and depositories;
iv) a common framework for prudential oversight;
v) emergency liquidity provision that includes lender-of-last-resort facilities for the financial system and the sovereign;
vi) common procedures and orderly resolution mechanisms for financial institutions and public entities.

These criteria have no necessary ordering or priority and while there are functional synergies between them, they are independent from the perspective of policymaking. In this sense, the criteria are optional to the extent that authorities and their constituents are willing to endure the cost of their absence. That said, each criterion is a necessary ingredient of stability, and the synergetic combination of all six may be considered as sufficient to provide stability.

The fourth section of the article demonstrates how the criteria work together to provide for stability. This section provides illustrations from historical examples of how different governments have grappled with the need to develop institutions like those we describe as 'criteria' to stabilize financial market integration. We analyse three national cases: the United Kingdom, the United States, and Canada. None of the examples properly fulfils the OFA criteria, yet all have managed over time to stabilize financial market integration to varying but relatively high degrees.

The fifth section provides a conclusion to the article, applying the approach to the international domain. It begins by taking note of political realities both within countries and among them: what is 'optimal' in terms of market structure or governance is not always possible given prevailing political interests. Even federal or unitary states fulfil the OFA criteria only imperfectly. The same observation would hold for existing monetary unions and the criteria for optimal currency areas. Nevertheless, the notion of 'optimality' may stimulate better policy. The goal is not to advocate utopia; rather, it is to provide a menu of choices together with cost-benefit analysis. The great contribution of the OCA literature was to help policymakers recognize the existence of a trade-off between the rationality of economic adjustment and political sustainability – not just in broad terms, but also on an issue-by-issue basis. We hope to provide similar guidance by gathering lessons from the history of financial crises and assembling them together in a common framework. The fifth section concludes by opening up a broader research agenda. The ambition is two-fold. Firstly, our account of the institutional preconditions for stable cross-border financial integration may not be exhaustive. Second, it is useful to look at financial integration projects both within and across countries and to assess how closely they approximate the criteria for optimality and what might be the consequences of falling short.

The value-added of the framework we propose is that it concentrates the debate on the political economy of finance. We are still a long way from properly confronting the dilemmas of capital mobility in our contemporary period of global integration. The time has come to build a systematic framework for collecting policy recommendations so that policymakers who seek to integrate financial markets either within or across countries do not repeat past omissions or mistakes. Moreover, the timing is propitious. The European Union recently embarked on an ambitious 'capital markets union' project to improve how firms and households access finance in Europe. The thrust of that project is different from the focus for our research, but the two efforts are complementary. If the EU should succeed in achieving its capital markets union, efforts to promote Europe as an optimum financial area will only become more important.

Beyond the Theory of Optimum Currency Areas

The ongoing crisis in Europe provides an opportunity to reconsider the influence of the theory of optimum currency areas on strategies for integrating markets across countries. The crisis also gives us a good reason to focus more attention on capital flows and finance. To explain why this is so, we start with the standard arguments for monetary integration and the notion that a design flaw in Europe's single currency may be the cause of the European crisis. This discussion demonstrates in relation to the example of the euro area how and why OCA theory misperceives the problem and

thus implies policy solutions that are unlikely to provide for financial stability under conditions of capital market integration.

According to OCA theory, countries should irrevocably fix their exchange rates only in the presence of integrated factor markets – meaning markets for labour and capital.[5] They should also do so when prospective participants have high trade-to-output ratios and so seek to enhance the autonomy of macroeconomic policymakers and their insulation from external shocks.[6] Where conditions are less than optimal because of factor market rigidities between countries or when geographic specialization makes countries more susceptible to 'asymmetric' demand shocks, OCA theory suggests that shared fiscal institutions for taxes and transfers can help promote long-run convergence while at the same time dampening the volatility of per capita income.[7] Without such correcting mechanisms, the currency area would be 'unstable' insofar as political leaders in the participating governments would eventually face a shock great enough to convince them to withdraw from the multi-national monetary union and re-establish their own national currencies.

Those countries that adopted the euro as a common currency (the 'euro area' or 'eurozone') have only some of these OCA attributes and to varying degrees.[8] Although labour mobility is an aspirational goal of the European treaties, workers are not mobile enough either within or across countries to absorb sudden shocks to unemployment. Few national economies are highly specialized geographically but business cycles and industrial structures are not closely correlated across countries and they are at very different levels of economic development.[9] Such shortcomings from the standpoint of OCA theory are not unique to Europe. What is unique is that shared political and fiscal institutions are not in place across the euro area to compensate for these shortcomings.[10] While the European Union (EU) provides some institutions to redistribute financial resources across regions, such funds are insufficient in quantity (and inadequately structured) to promote convergence. Instead, national member governments seek to make their economies more similar through open cooperation in market structural reform and by attracting cross-border investment.

The only OCA attribute that European countries share is a relatively high trade-to-output ratio. Nevertheless, when constructing their monetary union European politicians expressed more concern about constraining macroeconomic policymakers at the national level than maximizing their 'autonomy' at the European level; the fiscal policy coordination they implemented is too loose to constitute a meaningful pan-European instrument and the monetary policy framework is tied too

[5] Mundell 1961.
[6] McKinnon 1963.
[7] Kenen 1969.
[8] O'Rourke and Taylor 2013.
[9] Bayoumi and Eichengreen 1993.
[10] Eichengreen 1990, Krugman 1993.

closely to the goal of promoting price stability to afford much in the way of policy discretion. Insulation from external shocks has not improved dramatically either. Although Europe no longer experiences exchange rate volatility between euro countries, the volatility in euro-dollar exchange rates has a powerful and divisive influence on cross-country economic performance.[11]

OCA interpretations of the crisis

This failure to conform to the theoretical preconditions for a stable common currency is widely recognized in the literature; hence many commentators argue that the turmoil in the euro area demonstrates the wisdom of OCA-type considerations.[12] As evidence, they point to the challenge of macroeconomic adjustment now that the performance of national economies has begun to diverge sharply within a common currency. Those countries most affected by the crisis lack the capacity to alter relative prices by devaluing the nominal exchange rate or by allowing it to depreciate against major competitors in international markets.[13] Meanwhile, the euro area as a whole lacks the fiscal instruments to redistribute income either across different levels of economic development or in response to sudden demand shocks and workers are insufficiently mobile across countries for labour markets to absorb the sudden increase in unemployment. Within this context, national economic policymakers face an unenviable choice: either they leave the single currency or they find a way engineer (or endure) a real depreciation of relative unit labour costs through the compression of domestic nominal wages and prices relative to the rest of the euro area and, indeed, the wider world.[14]

The movement in relative cost indicators and current account balances during the first decade of the euro as a single currency appears to confirm the relevance of OCA theory to Europe's current predicament. German competitiveness increased dramatically during the first decade of the euro and countries on the periphery of the euro area moved deeper into deficit in their trade relations with the outside world as the German current account moved into surplus.[15] The cross-country variation in current account performance peaked in 2007; the crisis struck soon thereafter.

Relative cost and current account data seem to confirm the relevance of OCA criteria and yet other indicators present anomalies. To begin with, not all of the countries most affected by the crisis participate in Europe's single currency or even share a common exchange rate regime. The United Kingdom and Poland both experienced the early effects of the crisis; the impact on the UK

[11] Kenen 2002, Honohan and Lane 2003.
[12] Eichengreen 2012, Hancké 2013, Johnston, Hancké, and Pant 2014.
[13] Belke and Dreger 2011.
[14] Wright 2013.
[15] Bibow 2012.

was particularly profound.[16] Iceland, Latvia, Hungary, and Bulgaria also suffered.[17] Recognition of this fact does not obviate concern for OCA-type explanations, but it does suggest that there are wider forces at work beyond the consequences of monetary integration.

Anomalies are also present within the euro area. To begin with, the movement in competitiveness indicators and current account balances is uncorrelated. This can be shown on a case-by-case basis or through structured statistical analysis.[18] The implication is that the causal mechanism behind the European crisis does not operate through the impact of relative price movements on export performance. Governments can still attempt to respond to the crisis through a real depreciation in relative unit labour costs, but that will at best only relieve pressure on the balance of payments; it will not prevent the crisis from recurring.[19] Indeed, data for net balances on real-time gross settlement transactions between individual participating central banks and the network of central banks that constitute the euro area provides a window on balance of payments financing. What it reveals is that both Ireland and Italy experienced balance of payments crises against a backdrop of very small accumulated current account deficits; in 2008 Ireland experienced a sudden shortfall in balance of payments financing even as its current account moved from deficit to surplus.

Again, these anomalies do not vitiate OCA-style interpretations of the European crisis but they do provide an incentive to look for other explanations. Such explanations should pay less attention to exchange rate regimes, levels of economic development, relative labour costs, or current account balances. Instead, they should focus on the other side of the balance of payments: the capital account.

Focus on the capital account

Capital markets do not feature prominently in the OCA literature. The seminal contributions treat capital mobility as part of the broader consideration of factor market integration. To the extent that cross-border capital movements matter, they should facilitate the adjustment of relative prices and so make it easier for countries to share a common currency.[20] Of course not all of the classical writers were equally sanguine about the influence of cross-border capital flows. Some openly worried that such flows could promote volatility.[21] Nevertheless, most of the literature tended to

[16] Daripa, Kapur, and Wright 2013.
[17] Mabbett and Schelkle 2014.
[18] Sanchez and Varoudakis 2013, Tiffin 2014, Wyplosz 2013.
[19] Carmassi, Gros, and Micossi 2009.
[20] Ingram 1959.
[21] Fleming 1971, Corden 1972.

downplay the importance of capital markets for the successful functioning of a common currency.[22] If anything, they highlighted the advantages of irrevocably fixing exchange rates in a world of capital mobility. By having a single currency rather than different national currencies, Europeans could reduce the opportunities for speculation.[23]

A capital markets interpretation of the European crisis would not be bound by the single currency or the theory of optimum currency areas. As a result, it could encompass a wider range of national cases and it would focus on different indicators and causal mechanisms. A capital markets interpretation of the European crisis would also support different policy recommendations. In this way, it might offer an alternative to sustained compression of nominal unit labour costs as a mechanism for inducing competitive real depreciations.

The data to support a capital markets interpretation of the European crisis are found in terms of asset portfolio composition, firm structure, regulatory arbitrage or avoidance techniques and trading strategies. The underlying goal is not export market share but intermediation, yield and leverage. The narrative is that European policy makers liberalized capital markets at the end of the 1980s and began promoting the cross-border trade in financial services as part of the completion of the single European market. Initially, this capital market integration resulted in a consolidation of the banking and non-bank financial industries within European countries. Soon, however, the concentration of activity spread across different parts of the financial sectors and also across countries. Hence Europe witnessed the emergence of an integrated and consolidated financial sector in the 1990s with a shrinking number of large universal banks at its core.[24]

These large multinational and multifunctional financial institutions played a vital role in enhancing the efficiency of European capital markets by moving savings from countries where it was relatively abundant to countries that had unexploited opportunities for investment.[25] Along the way, convergence trading strategies brought long-term nominal interest rates together both inside and outside the single currency, financial innovation made it possible for firms to increase leverage relative to regulatory capital, and carry trading strategies made it easy for even unsophisticated investors to profit from accepting cross-border risk.[26]

The results of European financial market integration were not altogether salutary. The redistribution of liquidity created an adverse selection bias for lenders who could not adequately asses the quality of available assets and it created morally hazardous conditions for borrowers who

[22] Maes 1992, Tavlas 1993, Horvath 2003, Dellas and Tavlas 2009.
[23] Padoa-Schioppa 1987, Kenen 2002.
[24] Posner 2007, Mügge 2010.
[25] Blanchard and Giavazzi 2002, Abiad, Leigh and Mody 2009, Navaretti et al. 2010.
[26] Hardie and Mosley 2007, Hoffmann 2013.

tended to overextend their financial capacities.[27] Nevertheless, most participants felt that the gains from this integrated marketplace outweighed the disadvantages and so European policymakers contented themselves to mark improvements at the margins rather than overhaul the structures for financial supervision.[28]

Financial market disintegration

The results were sustainable so long as financial markets remained integrated – which is to say, so long as financial market participants remained willing and able to accept exposure across countries. European countries quickly fell into crisis however, once financial market participants lost confidence.[29] The first gaps appeared between institutions as perceptions of increased counterparty risk (or uncertainty) caused inter-bank lending to freeze up. Those banks most dependent upon interbank markets to meet their liquidity requirements were the quickest to suffer.[30] The British, Icelandic and Irish banks were near the top of the list. However, losses soon spread to other institutions as the unexpected market conditions and higher cost of liquidity began to eat away at intermediation margins and as the flight to quality sparked a more general pattern of deleveraging and thus the onset of severe financial instability.[31] For the countries of Central and Eastern Europe this meant that they lost access to the internal capital reallocation of the large West European banks – although it would have been much worse if Western banks had withdrawn altogether.[32] It also meant they faced an overhang of foreign currency denominated debt that they could not service without access to foreign credit. Some countries, like Latvia, accepted a huge compression of domestic activity as a superior alternative to currency depreciation. Others, like Hungary, used fiscal instruments to shift the cost of adjustment to foreign currency exposure from households back onto the banks.

In short, the European integration financial marketplace was being torn apart as capital retreated to those jurisdictions seen as havens. The disintegration of European financial markets progressed to the point where the euro faced an existential crisis as a single currency. That point was captured in European Central Bank (ECB) President Mario Draghi's 26 July 2012 speech to the London financial community where he promised to do 'whatever it takes to preserve the euro' and where he

[27] Martin and Taddei 2013, IMF 2013.
[28] Grossman and LeBlond 2011.
[29] Gros 2012.
[30] De Grauwe 2010, Tett 2009.
[31] Beber, Brandt and Kavajcez 2009, Krishnamurthy 2009. The pattern here is not unlike a bank run, but with geographic markets rather than banks being the subject of attack. See Diamond and Dybvig 1983, Pedersen 2009.
[32] Navaretti et al. 2010, IMF 2013, Epstein 2013.

underscored: 'believe me, it will be enough'.[33] Draghi's speech is worth citing at length because of the diagnosis it offers:

> The short-term challenges in our view relate mostly to the financial fragmentation that has taken place in the euro area. Investors retreated within their national boundaries. The interbank market is not functioning. It is only functioning very little within each country by the way, but it is certainly not functioning across countries. And I think the key strategy point here is that if we want to get out of this crisis, *we have to repair this financial fragmentation* [emphasis added].[34]

What connects this financial market fragmentation to the euro as a single currency is the introduction of what Draghi called 'convertibility risk', which is the perceived likelihood that cross-border assets or liabilities will suddenly change denomination because a sovereign participant in the monetary union opts to reintroduce its national currency. The more financial market participants price in a risk to convertibility, the less the euro functions as a common currency. However, Draghi was careful to note that this threat was not the start of the problem; rather it was the culmination. Before the situation became critical, banks stopped lending to one-another and national financial regulators discouraged firms from sending liquidity abroad. In other words, instability in the euro as a single currency was the consequence of instability in financial market integration – and safeguarding the euro was only the first step in addressing the broader challenge of financial market disintegration. What were seen by many European policy makers as the centrifugal forces driven by OCA macroeconomic adjustment dynamics within the euro area were in fact the dynamics of financial crisis operating cross borders regardless of single or national currency.

This experience underscored the importance of closer attention to the pattern of financial market integration.[35] It also opened a debate about how much financial market reform would be required to insulate European economic performance from the consequences of external financial shocks.[36]

'Stability' and Integration

This section seeks to clarify further the problem we are addressing with our theoretical framework. What do we mean by stability? This question admits of two distinct but related discussions: i) the maintenance of financial integration; and ii) the issue of moral hazard and 'too big to fail' as

[33] Draghi 2012.
[34] Draghi 2012.
[35] Sapir 2011, Goodhart 2012, Obstfeld 2013.
[36] Begg 2009.

specific problems of financial governance. As was established in the introduction, we do not focus on the stability of currency zones and the macroeconomic adjustment concerns of OCA theory. The analysis of the previous section encourages us to look elsewhere. We also do not limit our focus to traditional understandings of financial stability. We are not concerned with the broader dynamics that occur when market volatility spills over into crisis.[37] We are concerned with the moment where external shocks or internal dynamics of the financial sector threaten to break financial markets into distinct geographic jurisdictions. That said, any proposal to provide an institutional framework that might prevent the failure of one or a network of interconnected counterparties mutating into a breakdown of financial market integration requires addressing the issue of too big to fail and moral hazard. So the one follows from the other and these issues are taken up in turn. First we contrast stability in relation to monetary versus financial integration, and then we address moral hazard.

Financial integration and 'stability'

The challenge of adding finance into the discussion of OCA theory is that monetary integration and financial market integration are different kinds of processes. Monetary integration is defined in terms of discrete jurisdictional compartments and policy questions. Currency geography is largely national except where reserve currencies are concerned. Exchange rates are flexible, managed, fixed-but-adjustable, or irrevocably fixed. Currencies are inconvertible, they are convertible, or they are locally interchangeable – like Sterling and the Gibraltar pound. We can look for continuities between the various categories and yet the process of monetary integration remains a step-wise movement from one category to the next. Monetary disintegration is a step-wise movement in the opposite direction.

Financial market integration does not work in such a discontinuous way. Instead financial integration takes place on a continuous spectrum of cross-border interaction, marked by the absence of capital mobility at one end and perfect capital mobility at the other. Neither of these extremes is easy to find in practice and most markets sit somewhere in between, where investment capital and financial services cross borders with greater or lesser facility. The process of financial integration constitutes a movement along the spectrum of interaction toward the ideal of perfect mobility; disintegration moves the other way.

Monetary integration also involves a more restricted number of actors than financial integration. Governments determine monetary integration as an act of policy. Governments (or parliaments or central banks, depending upon the constitutional arrangement) decide whether or not to make the currency convertible, what transactions qualify for currency conversion, how the external value of

[37] Kindleberger and Aliber 2011.

the currency will be determined and whether to replace the national currency with some other instrument like a foreign currency or a multinational currency. This may involve consultation with the private sector, but it is a jurisdictional matter: so long as the responsible authorities are willing to accept the consequences, they can commit to operate within any one of the various monetary regimes, ranging from autarchic, non-convertible currencies through different systems for managing convertibility (and therefore also exchange rates) through competing currencies right up to the surrender of monetary autonomy within a shared, multi-national currency. 'Accepting the consequences' is not a trivial matter and the political decision over how much monetary integration to embrace is likely to be controversial both before and after the fact. Indeed, the whole point of OCA theory is to help frame expectations for how this controversy is likely to play out under different macroeconomic circumstances and given the distribution of costs and benefits under different monetary regimes.

The measure of stability in a monetary regime is thus equivalent to the degree of political commitment. The choice of a monetary regime is stable so long as the political will remains to participate. That is why Draghi was so eager to insist that: 'When people talk about the fragility of the euro and the increasing fragility of the euro, and perhaps the crisis of the euro, very often non-euro area member states or leaders, underestimate the amount of political capital that is being invested in the euro.'[38] Following this line of reasoning, the euro is 'strong' – in Draghi's words – because European leaders are committed to it. Instability in a monetary regime arises when that political will begins to waver and as the pressure increases on political leaders to make a different choice. A good example of instability might be when U.S. President Richard Nixon opted to end the convertibility of dollars into gold or when UK Prime Minister John Major pulled the British pound out of the exchange rate mechanism of the European Monetary System in 1992.

Financial market integration is a complex process that involves less clear step-wise choices (though it does involve policy decisions) and it also involves a much broader array of actors. Governments may choose to lower the restriction on cross-border capital flows and to create the conditions for the cross-border trade in financial services, but in doing so governments are only handmaidens for the private sector. Financial and non-financial firms are the primary engines for financial integration because they are the actors that make capital flow and so they are also the actors responsible for the build-up of cross-border investments. This flow of capital may seem mechanistic: once governments create the conditions to favour financial integration, then firms should respond to the changed landscape of market incentives much like water responds to a

[38] Draghi 2012.

sudden change in the terrain. However, such theoretical predictions do not always work in practice: politicians may relax barriers to cross-border capital flows and yet not get a market response.[39]

The large number of actors involved in the market geography of financial integration and the continuous spectrum of cross-border financial interaction combine to create a more diffuse pattern of stability and instability when compared with monetary regimes. Financial integration is 'stable' so long as and insofar as market actors perceive incentives to move capital or maintain investments across borders; financial integration is 'unstable' when perceptions change and financial actors adjust their positions to match the new calculation of costs and benefits or risks and returns in relation to their counterparties across whatever 'border' they perceive, monetary or national, developed versus developing economies, or otherwise. The result can take the form of a flight to quality, a flight to liquidity, a reassertion of 'home bias', or some combination of the three.[40] Because a wide range of factors can influence market perceptions of incentives, it is challenging to isolate those influences that tend to reduce cross-border capital flows from those that focus on broader macroeconomic conditions or narrower microeconomic concerns (like country-specific or counterparty risk). An economic downturn or a weakened counterparty does not necessarily entail a threat to financial integration even if either can result in a redistribution of liabilities and assets. Such factors only become destabilizing insofar as they put the whole practice of cross-border investment at risk. In such a context, political will is not enough to create stability. Instead, policymakers interested in stabilizing financial integration strive to make cross-border capital flows more resilient to adverse changes in country- or firm-specific factors by reducing uncertainty for market participants.[41]

Stabilization, moral hazard and 'too big to fail'

Thus the formula for stabilization is a further point of difference between monetary integration and financial integration. The policy goal in monetary integration is to make the monetary regime more durable by strengthening the participating countries. The policy goal in financial integration is to make financial market integration more resilient given the likelihood that market participants will fail.

The contrast here reveals an important difference in terms of political legitimacy. A monetary union forged at the expense of one of the participants would be hard to justify. Why should one participant have to suffer so that others may prosper? OCA theory helps national politicians avoid having to answer this question. Legitimacy derives both from the normative analysis of aggregate

[39] Feldstein and Horioka 1980.
[40] Vayanos 2004, Baele, Bekaert, Inghelbrecht, and Wei 2013, Giannetti and Laeven 2012.
[41] Diamond and Dybvig 1983, Caballero and Krishnamurthy 2008.

economic welfare and from the positive analysis of rational choice in politics. In keeping with the predictions of OCA theory, more diversified, flexible and adaptive national economies are better equipped to minimize the costs and so maximize the net benefits of participating in a common currency; politicians in more diversified, flexible and adaptive countries are less likely to experience political pressure to change the monetary regime as a consequence. All things being equal, a monetary union comprised of such countries would be more resilient and less prone to defection than a monetary union made of more specialized, less flexible and more rigid countries.

By contrast, the legitimacy of financial integration hinges on the ability of policymakers to stave off the threat of blackmail. Why should taxpayers be made to suffer so that individual market participants can be bailed out? OFA theory helps policymakers construct a system that is resilient enough to absorb or accommodate the collapse or failure of a major participant – whether private sector, public sector, or market infrastructural – without triggering a re-nationalization (or re-localization) of financial relationships. The challenge here is to strike a balance between the systemic dimension of excessive risk aversion on the one hand, and moral hazard in relation to any individual or network of financial institutions on the other. Risk aversion is 'excessive' insofar as market participants stop responding to market incentives and abandon otherwise profitable investments.[42] Moral hazard results when market participants take on too much risk in the belief that policymakers will ultimately absorb any related costs.

Notionally, any policy that seeks to address issues of counterparty risk in the interests of enhancing financial stability may generate moral hazard. Size-plus-leverage of particular financial institutions ('too big to fail') and the enhanced interconnectedness among financial institutions are factors that potentially exacerbate the problem. A process of financial integration is likely to lead to larger and more interconnected financial institutions. Thus our theory of Optimum Financial Areas needs to address moral hazard as a problem. Our argument on this point is straightforward: minimising the risk of moral hazard swings free the goal of stabilising the 'market geography' of integrated financial systems. Moral hazard arises from the particular ways in which regulatory and supervisory systems manage liability and interconnectedness, not from a commitment to the stability of financial integration *per se*.

Criteria for Optimal Financial Areas

We now turn to the 'how' of what is to be done and discuss the six OFA criteria and their underlying rationale. We have argued so far that the crisis of the euro area justifies a theoretical

[42] As Timothy Geithner (2014: loc. 2376) explains: 'Among the defining features of a panic is the fact that markets become less discriminating – more likely to run from everyone rather than try to figure out whose fundamentals seem strong.'

retooling of the debate about financial stability that refocuses attention on the market geography of financial integration and the dynamics of capital mobility. An optimal financial area is thus one where firms deploy capital across borders in response to market incentives and where episodes of market tension do not result in instability manifested in a re-localization of integrated financial relationships.[43] This section introduces and substantiates in relation to the policy failures of the financial crisis in Europe our choice of two sets of criteria that promote the stability of cross-border financial integration as defined in this work. These criteria will be subsequently defined and operationalized empirically in section four analysing their mergence in the context of historical monetary unions.

Each of the two sets of criteria can be divided into three parts – making six criteria altogether. The first set of criteria relates to the technical substructure of markets and serves as an *ex ante* underpinning for confidence in the financial system (see Box 1). This is where we cluster issues related to having:

i) a common risk free asset that serves counterparties as collateral for liquidity access and clearing and as a safe haven in times of distress;
ii) a central system for sovereign debt management such as a fiscal agent or national central bank; and,
iii) centralized counterparties and common procedures for managing the risks of communication, clearing, settlement, and depositories.

The second set of criteria relate to the challenge of the prevention of instability and active market stabilization in times of distress (see Box 2). The issues here concern

iv) a common framework for financial supervision and prudential oversight;
v) lender of last resort facilities for financial institutions and, ultimately, the sovereign (monetising debt when push comes to shove);
vi) mechanisms to rationalise expectations in the event of a resolution of either private or public financial entities or both.

There are three reasons for selecting these criteria. The first is functional. These criteria focus on the policy problem of managing both the flow of capital across borders and the cross-border investment stocks that accumulate over time. They also focus on risk management. Those criteria related to the technical substructure of markets seek to minimize risk in those areas where being 'free' of risk is functionally important – as in 'risk free' assets or sovereign debt management – and to concentrate risk where it can be recognized and managed as a public good – as with market

[43] Pedersen 2009, Krishnamurthy 2009, Can Inci, Li and McCarthy 2011.

infrastructures. Those criteria dealing with prudential oversight, lender-of-last-resort, and resolution focus on creating appropriate incentives for active risk management by market participants.[44]

Box 1: The 'Technical Substructure of Markets'

One of the major goals of our contribution is to emphasize that financial market stability depends less on our contemporary and standard notions of the institutional and policy framework for macro- and micro-prudential oversight than it does on a clear understanding of how and why financial markets actually function the way they do. We need a clear account of the 'mechanism' that underpins how financial markets are 'put together'. The challenge, therefore, is to highlight the most important elements in 'how financial markets are put together' so that they function in a stable fashion. We identify structural features that have shown up time and again as important in contemporary European debates and in our historical case studies. There is of course much more work to be done both in detailing how these technical issues can be resolved in relation to practical examples of functioning systems or ongoing processes of financial integration. There may emerge other issues that should be added to the list. There is also a vast and expanding literature that addresses these matters. The challenge is to bring that literature into the wider conversation about how best to stabilize financial market integration: how does the provision of financial stability interact with the 'mechanisms' of functioning financial markets?

We chose the term 'technical substructure of markets' because we wanted to have a category for what underpins the day-to-day working of financial markets that would encompass everything from currency issue and sovereign debt management to more traditional market infrastructures related to communication, clearing, settlement, depository and the like. The first two 'criteria' we offer can probably be collapsed into one set of concerns about what assets financial actors can use for collateral and as a safe-haven and how these assets are constructed, managed and safe-guarded. We broke this into two criteria – common risk free asset and centralized system for sovereign debt management – because that is how these issues have tended to develop over time and also because in technical terms there is a difference between sovereign debt and the currency, even if in a functioning financial market context these are often seen as interchangeable. First financial institutions adopt a standard for what they will accept and use as collateral, and then public authorities step in to construct an instrument (either a currency or a sovereign debt issue) that meets or improves upon that standard.

Our third criteria relates to market infrastructures for communication, clearing, settlement, and depositories. This also invites further analysis and debate as well. What we find in our case studies is that there is a tendency over time to regard these infrastructures as public goods or utilities. The implication is that there should be some common procedures for managing the systemically important role that such institutions play in an integrated financial market. We do not make the case for common procedures explicitly in this paper. Again, our goal with this paper is to highlight that these technical issues are essential to take into consideration in debates about the stability of financial integration. The next step is to synthesize the existing debate about market infrastructures into a concrete set of policy recommendations for different integrated financial areas. That is the research agenda that we set out in our conclusion.

[44] Diamond and Dybvig 1983, Caballero and Krishnamurthy 2008.

Box 2: Confidence Building and Active Market Stabilization

A second goal of our contribution is to highlight the importance of long-run confidence building measures in addition to efforts at active market stabilization in a crisis. Again, this is a vast literature and so this initial contribution is simply to show how existing analysis can be tied into the broader debate on how we should think about financial stability and its active provision. The range of issues stretches from a common rulebook for financial institutions through lender of last resort facilities to predictable and transparent procedures for debt restructuring and resolution. At this stage we are not attempting to provide detailed optimal design specifications for each of these facilities. That is a subject of ongoing discussion in a wide array of forums and we will develop these specifications as this project proceeds. Rather we want to emphasize that this package of issues must be tackled in a systematic manner and that it must be connected with the more technical conversations about the provision of risk free assets, sovereign debt management, and market infrastructures.

The second reason has to do with synergies. These criteria make sense because of the way they work as a package – both in terms of the technical substructure of markets and in terms of market stabilization mechanisms. Although there is no unique path to progress, the achievement of any additional criteria is likely to complement earlier developments. For example, it is difficult to imagine a common risk-free asset as a 'flight to quality' refuge without central sovereign debt management and lender-of-last-resort facilities. Sovereign debt is too often employed by private institutions as collateral with each other or the central bank to ask questions about it in a crisis.

The third reason is empirical. As our case studies illustrate, national systems of governance that encouraged financial market integration across different sub-national jurisdictions within national boundaries encountered problems of instability on a regular basis. Slowly over time and in different ways they developed an institutional framework for financial governance that imperfectly but to a high degree fulfil the criteria we have identified. There was little in the way of 'off-the-shelf' wholesale borrowing of these arrangements from one jurisdiction to another. Lessons were learned along a national pathway yet all three cases ended up in much the same place in substantive and operational terms. They have all developed mechanisms to prevent the disintegration of market geography, to manage counterparty risk and address moral hazard, and that recognise the systemic utilities that are required to underpin the operation of markets.

None of these empirical cases reaches the ideal of an optimal financial area. In that sense, history reveals that the adoption of OFA criteria remains optional to the extent that one accepts the cost of their absence. But building an institutional framework for financial governance that fulfils all six criteria is the best policy option: we argue that each is necessary and the interactive combination of all constitutes a sufficient condition for the achievement of financial stability.

The 'technical substructure' of financial markets

By 'technical substructure of markets' we mean the institutional and policy framework that incentivises the process of financial market integration across a particular financial geography. Without this 'substructure', financial integration and markets cannot function efficiently.

How did the development of this set of criteria play out in the crisis of the euro area? The European Union anticipated many of the challenges in integrating the technical substructure of markets well before the euro was introduced as a common currency. In 1996, the European Commission created a group under the chairmanship of Alberto Giovannini to bring market participants and policymakers together in order to explore the many challenges in promoting greater technical efficiency in the markets. The Giovannini group issued a series of reports to tackle a range of issues from collateral rules and sovereign debt management to clearing and settlement. Along the way, the Giovannini group made a number of recommendations in order to enhance the operational efficiency of interbank markets – particularly those that provide liquidity against collateral in the form of repurchase agreements (repo markets).

The story about collateral is particularly important. Prior to the cross-border integration of European financial markets, financial institutions tended to rely almost exclusively on their home country sovereign debt instruments as a risk free asset to use in treasury operations to collateralize repurchase agreements or to gain access to central bank liquidity. The most common form of collateral used in cross-border transactions was either United States Treasury instruments for dollar liquidity or German bunds for intra-European borrowing. When faced with the prospect of greater intra-Europe financial integration, market participants were quick to note that the volume of German bunds was too small to provide a sufficient pool of collateral. Hence they argued in favour of an arrangement wherein other national sovereign debt instruments could have a status roughly equivalent to German bunds in order to widen and deepen the pool.[45]

The concession to treat European sovereign debt instruments as roughly equivalent risk free assets for collateralizing both cross-border lending in repo markets and central banking had immediate implications for the liquidity of sovereign debt markets. Even the smallest issues became more attractive to bank treasurers; the larger debts stocks like those in Italy suddenly began to trade very widely. If only 6 per cent of Italian sovereign debt obligations were held by foreigners in 1991, more than 27 per cent was foreign held by the introduction of the single currency. The pan-European functional role for national sovereign debt instruments goes a long way toward explaining both the speed of long-term nominal interest rate convergence across European

[45] Gabor and Ban 2014.

countries and the tight and stable compression of cross-country yields during the first eight years of the single currency.[46]

The problem is that not all European sovereign debt instruments were equally liquid. This new 'technical substructure' began to unravel geographically as the global financial crisis began to have an impact on European markets in mid-2007. Investors began moving out of relatively illiquid assets and into German bunds in an incipient flight to liquidity. The effect of this movement was to increase German bond prices and so raise the spread between German bonds (where yields fell) and other sovereign debt instruments (where yields remained roughly constant). Importantly, however, this initial movement in the flight to liquidity was *not* across sovereign debt instruments per se. Hence the prices (and yields) for sovereign debt in other countries remained the same even as the spread between their bonds and Germany's increased.[47]

That pattern of flight to liquidity began to change in March 2008 when investors first expressed serious concern about Greece. What started as a flight to liquidity soon became a flight to quality. Banks began to shift away from their liquid exposure to Greek sovereign debt instruments and the yield on those instruments began to increase. The shift away from Greece accelerated in October 2008 when the Greek government made a very small restatement of its fiscal accounts and the markets threatened to dump Greek debt entirely in the early winter months of 2009 after Standard & Poor's issued a downgrade. At this point, the concern in the markets was not so much that Greece would default, but rather that successive downgrades by the three main credit rating agencies would push Greek sovereign debt below investment grade. If that were to happen, then the banks would no longer be able to use Greek debt as collateral for central banking operations in the euro area. This would not only decrease the value of the instruments per se, but also impose losses on those illiquid stocks of Greek sovereign debt instruments that the banks use for treasury operations and so must hold to par.

The progression of the Euro area crisis from this original Greek turmoil onward is well known. The starting point was the shift of bank holdings from Greek sovereign debt to German bunds. This was at best always going to be an incomplete process given the nature of bank exposure. A number of banks both within Greece and elsewhere held significant amounts of Greek sovereign debt for use as collateral. Hence, when Greece finally requested its bailout in May 2010, the European Central Bank had to change its collateral rules in order to continue accepting Greek sovereign debt instruments whatever their credit rating. And when the ECB finally refused to accept Greek sovereign debt instruments during the March 2012 restructuring process, it had to make available a

[46] Buiter and Siebert 2005.

[47] This pattern is consistent with that found by Beber, Brandt and Kavajcez (2009) during the period before the crisis. They show that investors are likely to be more interested in liquidity than credit quality in periods of market tension.

new pool of collateral for the Greek financial system. The two largest Cypriot banks were also caught out when Greek sovereign debt lost its 'risk free' status and so had to seek emergency liquidity assistance from the Central Bank of Cyprus against inferior forms of collateral.

The central banks were not the only institutions affected by the deterioration of sovereign debt instruments as risk free assets. Governments struggled to meet their funding requirements in sovereign debt markets and clearing agencies worried about their exposure to losses as well. This created a number of critical junctures where the crisis could move out of control. If a national government faced an investor strike or if national firms found themselves locked out of international markets, the macroeconomic implications would be dramatic. Indeed, in many countries they were. Financial contagion was moving rapidly through a market geography that had initially survived the global financial crisis better than most.

Another concern in this regard is the strong symbiotic relationship between national financial systems and their home country sovereigns. Where government is compelled to issue debt to bail out the banks and the banks are in turn exposed to that debt through their asset portfolios, then perversely efforts to save the banks end up hurting both sides of the rescue operation as new issues of sovereign debt undermine the market prices for existing stocks –imposing losses where the assets have to be marked to market and reducing the value of par holdings as collateral. The banks end up needing more money from sovereigns and the sovereigns end up having more trouble raising funds in private markets. This symbiosis was most evident in Spain during the early months of 2012.

Active market stabilisation

Our second set of 'market stabilisation' criteria involves both prevention (a comprehensive framework for prudential oversight) and active market stabilization measures in a context of market distress (lender of last resort functions for banks and ultimately the sovereign, and a resolution regime).[48] During the crisis, the European response in this regard was to look at ways to shore up the banks, but the treaty framework of monetary union precluded liquidity provision to sovereign debtors whose assets were being dumped by the market with clear consequences for both financial stability and the integration of the market. This same sovereign debt was the backbone of the system of collateral used by the banks to underpin confidence in the financial system. The collapse in confidence in these assets (sovereign liabilities) would lead rapidly to the disintegration of the highly integrated financial area.

[48] Diamond and Dybvig 1983, Caballero and Krishnamurthy 2008.

Thus European efforts to restore confidence in cross border banks would ultimately prove ineffective. The European Central Bank could support financial institutions in distress and did so. The ECB was prevented from offering similar support to sovereigns because of the 'no bail-out' clause in the European treaties.[49] This led to the emergence of a 'doom loop' between national bank rescue and investor confidence in sovereign collateral that could not be broken because national authorities could not on their own raise enough resources to stabilize the banks and they could not bolster confidence in private capital markets. The European Banking Authority also had insufficient supervisory powers. It organized two rounds of stress tests but could not force national governments to resolve failing institutions. Worse, the parameters for the stress-testing exercises proved overly optimistic and the failure of a number of 'passing' institutions made it clear that some more robust framework would be required.

The debate about a European banking union thus crystallized in May and June of 2012 around the necessity to find some arrangement for overseeing and implementing the direct recapitalization of Spanish banks using European resources. The initial focus was on the requirement for a single supervisory mechanism for systemically important financial institutions. This mechanism was bound up with the need to offer lender of last resort facilities to both financial institutions and sovereigns. It was also paired with the requirement to have a common framework for banking resolution including both established procedures and pooled resources. Implicitly, as successive Greek bailouts have demonstrated, such a resolution framework, combined with liquidity support for both banks and the sovereign, should extend to sovereign borrowers as well in order to create more transparency and predictability. As we argue above, the challenge is to do so without creating excessive moral hazard.

There are two points to note. The first is that while Europe has suddenly confronted this complex agenda implied by our criteria, it was not at all the first to do so. These same issues have arisen persistently in other countries. The requirements for stable financial market integration are a common feature of financial market geography. Not every country or region tackles this challenge in the same way, but each gets as close as it can eventually.

The second point to note is that monetary integration is often a part of this same process of providing stability and was intended to be so in the case of the euro area. We accept that integrated financial areas need not choose a single currency as part of their attempt to provide stability – we fully recognise that monetary union comes along with a host of other implications as set out in the theory of optimum currency areas. Nevertheless, our criteria imply that a single currency has

[49] See articles 122-125 of the Consolidated version of the Treaty on the Functioning of the European Union, *Official Journal of the EU*, C 326, vol. 55, 26th October 2012, 98-9.

significant advantages in terms of financial stability. As governments have historically sought means to stabilize integrated financial markets they have also sought to develop a risk-free asset through proper monetary unions along the way.

One of the most important advantages of a monetary union is the relaxation of the intra-regional balance of payments constraint. That is another way of saying there is (potentially) infinite balance of payments financing for intra-regional imbalances. This property was recognized in the US in the 1940s as an automatic property of the inter-district balances between the different Federal Reserve Banks.[50] At the time, the plan was to clear and settle these balances. Over time, however, the governors of the Federal Reserve System learned that the clearing is unnecessary and the settlement is potentially problematic. Negative or positive balances within the system are better left as accounting conventions because these imbalances are simply not attributable to any one or group of 'units': they are attributable to the interactions of the market geography as a whole.[51]

In the European context, intra-regional balance of payments financing is a feature of the real-time gross settlement system for managing cross-border financial transactions (called TARGET in its first iteration and now TARGET2).[52] As the financial crisis struck different parts of the euro area with variable intensity, many policymakers were alarmed by the build-up of liabilities in their respective 'national' central banks. At one point, Bundesbank President Jens Wiedmann even suggested that negative TARGET2 balances should be collateralized. However that presented major problems because any effort to secure negative balances threatened to reintroduce a financial constraint on the intra-regional balance of payments within the single currency, thus intensifying the crisis.

This controversy over TARGET2 reveals a new dimension to the solidarity required for monetary integration: participating countries must accept that parts of the monetary union will be in debt to the rest of the system both in (potentially) unlimited amounts and for (potentially) indefinite periods of time.[53] Such political solidarity is familiar to central bankers who have had to negotiate swap agreements for dollar liquidity with the US Federal Reserve System during the crisis as well. Monetary integration raises the political stakes, but it does not present a problem that is altogether different.

In the end, the commitment by the European Central Bank to purchase 'unlimited' amounts of sovereign debt instruments with a short-term residual maturity from sovereigns in distress proved to be the 'enough' that Draghi promised. Although the ECB President sold this policy as an

[50] Hartland 1949.
[51] Bijlsma and Lukkezen 2012.
[52] Fratzscher, König, and Lambert 2013a.
[53] Fratzscher, König, and Lambert 2013b.

instrument to 'repair the monetary transmission mechanism', it was clear that the ECB was offering to act as a lender of last resort for sovereign debt markets. As a result, bond spreads fell rapidly between distressed country sovereigns and the German benchmark. This mitigated but did not eliminate the fragmentation of European financial markets. Although Draghi was quick to celebrate the success of OMT he was equally quick to admit that a more comprehensive framework would be required to restore European financial integration. Indeed, even eighteen months after OMT was announced, the ECB admitted that European financial markets remained more fragmented than they had been since the start of the single currency.[54]

History's Lessons

This section explores some brief historical sketches of the evolution of financial market integration in three countries and as a pre-cursor to more recent European experience. We demonstrate across three national cases how emerging national monetary unions operationalized our six criteria under conditions of financial integration. The starting point is the observation that financial market integration is relatively new both within countries and between them. Enhanced market liquidity also requires management. The higher the degree of internal and eventually cross-border capital mobility, the more difficult it becomes to achieve financial stability.[55]

The objective of this section is therefore to show how systems of both private and public (or mixed) governance over time increased their capacity to stabilize financial integration by adopting institutional arrangements approximating those we set out as criteria for an optimal financial area. Our theory predicts that as financial integration and capital mobility increases, market agents and policy-makers begin to grapple with these problems by creating new systems of governance. In doing so they are often confronted with private interests (e.g. in the financial system) that oppose the process of reform and the strengthening of governance mechanisms. Yet the costs of instability both to governments and to the process of economic development increases the pressure for new forms of governance, and the eventual requirements of political legitimacy that result from the impact of financial crisis on broader socio-economic constituencies are also important driving forces.[56]

In functional terms, each system gropes its way towards the fulfilment of the OFA criteria in different ways and in a different chronological order. The variations across national configurations may prove enduring. Although the criteria eventually function in a highly interdependent fashion, some do appear to have proved more important than others in the emergence of systems of financial

[54] ECB 2014.
[55] Reinhart and Rogoff 2009.
[56] Cassimon et al. 2010.

governance. Finally, we argue that this process swings free of the ways in which these same monetary unions moved over time to cope with the OCA problems of internal macroeconomic imbalances and their costs to different economic zones of the steadily integrating economy. Adjustment to monetary integration and financial integration are not identical policy issues, even if they are complementary processes.

Case selection is important in this regard. We focus on three country cases, each of which experienced significant episodes of financial market volatility as local financial networks merged into national financial systems, and these national systems developed in a global context. These processes occurred in symbiosis with the formation of what came to be 'national' monetary unions formed from a range of units. Specifically, we choose three 'market-based' financial systems: the United Kingdom; the United States; and Canada.[57] While they share a range of characteristics, including common historical origins, each became a monetary union and integrated financial space at a different pace and in different ways. This yielded contrasting experiences in terms of dealing with the challenges of financial stability and debt management as episodes of instability interacted with the process of reform and improved governance. Thus each moved towards fulfilment of the OFA criteria in a different order and in different ways over time in response to their specific experiences and challenges in terms of financial stability. Still, currently none of the three can be held up as ideal-typical examples of an optimal financial area and their respective difficulties in the face of the global financial crisis stands as testimony to the need for further reform of financial governance. The recent global financial crisis has prompted further reform, but not always in the right direction (see below).

The United Kingdom

The UK is a prime example of the early emergence of several of the most crucial OFA criteria. This process was driven by the needs of the Crown, particularly in relation to the finance of war, and by the demands of trade finance and the growth of merchant and financial capital. Over time as financial markets became more global and complex, the challenges of financial stability became increasingly important. The story begins with the establishment of the Bank of England in 1694. The Bank initially bore little resemblance to its current 'Central Bank' self.[58] The Bank's £1.2 million in privately-subscribed capital was essentially a swap to fund the national debt born of ongoing war. The Bank retained a monopoly in transactions and issuance on behalf of the Treasury. So the first OFA criterion to be fulfilled was a sound system of public debt management

[57] Zysman 1984.
[58] (http://www.bankofengland.co.uk/about/Pages/history/major_developments.aspx#2) accessed 10-03-2014.

independent of the Crown itself, thus containing the impact of sovereign debt on the financial system and economy.

The privately-owned joint-stock and limited-liability Bank could augment its resources and activities by engaging in the business of banking, taking deposits and issuing its own notes in competition with a wide range of other London and 'country' banks that emerged over time. Indeed the Bank was initially the only Bank granted limited-liability status, which guaranteed that it would be the only bank capable of large-scale banking.[59] These resources made it a major player in the markets, and its monopoly on the issuance of government paper that could serve as collateral in the financial system was far from immaterial to this process. As notes were redeemable for gold, the Bank had to maintain sufficient gold reserves and other assets to maintain the confidence of its investors and depositors. Over time, confidence in the Bank meant that it took on an important share of the deposits of other banks, thus developing an interbank market, financial market activities, and functioning as a refinancing facility. London and the market geography of the Bank's orbit thus developed important ties to the rest of Europe. Meanwhile England had engaged in political union with Scotland in 1707, which by the 1840s became a full monetary union. In 1800 there was political union with Ireland, followed by monetary union in 1826. Yet in keeping with our arguments in this article, the integration of financial markets followed a different trajectory from that of the dynamics of currency union. For some time, 'London' remained distinct from the 'country' banking system just as Edinburgh maintained its own national and global market geography. Developments in the 19th century would eventually bring monetary and financial integration processes together.

The demands of war through the 18th century to the end of the Napoleonic period saw the expansion of the national debt to some £850 million in 1815. The pressure on the Bank's reserves of government need in the Napoleonic wars had been such as to lead to a suspension of gold convertibility from 1797 to 1821, thus removing government debt from a range of market pressures in a time of national emergency.[60] The post-Napoleonic period proved to be one of problematic debt workout, bank failure, financial panic, and monetary instability. Bank failure rendered the notes of private banks worthless, and there was a clear need for more confidence in the monetary system. This led to the fulfilment of a second criterion: the provision of a common risk-free asset through the 1844 Bank Charter Act, extended to Scotland in 1845. In reality this function had been emerging over time just as the Scottish banks became progressively more engaged in the London market such that monetary union progressively suited both sets of interests. Key milestones were

[59] De Cecco 1984: 79.
[60] (http://www.bankofengland.co.uk/about/Pages/history/major_developments.aspx#4) accessed 10-03-2014.

the establishment of the Bank's notes as legal tender (1833), but more particularly the growth of confidence in the Bank's management, its notes, in government paper, and as the Bank's position in the interbank markets had grown. But the 1844 Act also gave the Bank a monopoly on note issuance by prohibiting any new private banks from issuing Sterling, so private banknotes dwindled over time in England.[61] Crucially in terms of confidence, the Bank's new monopoly was restricted by the Gold Standard: note issuance beyond the Bank's own capital was strictly tied to its gold reserves, which were in turn linked to international payments. An additional measure to ensure the stability of the currency was the statutory separation of the Bank's issuance and banking activities into two departments.

The Bank's role in the markets and its relations with other banking institutions had led to the emergence of a third OFA criterion: a central clearing and settlement system in which the Bank functioned as settlement agent to the finance houses. London interbank clearing had begun in the later 18th century in the Five Bells tavern in Lombard Street, and by the early 19th century had evolved into the 'Bankers' Clearing House'. Limited to the London finance and discount houses at first, through access the discount window and the deposits that commercial banks and other finance houses held with the Bank, they could count on these as secure sources of liquidity to underpin the risks of clearing and settlement in support of the clearing system. The joint-stock 'country' banks were admitted to the system in 1854 at the same time as the system switched to settlement accounts held directly with the Bank of England. The Bank of England itself joined in 1864, and this development was the direct antecedent of the current CHAPS settlement system.[62] Meanwhile, Scotland had developed its own system of clearing around the Bank of Scotland and Royal Bank of Scotland. They could clear on London through correspondent banks, and in 1886 they opened their own branches in London to clear through the system there.[63] The London Stock Exchange evolved its own parallel system of clearing and settlement, but by the 1890s the Bank was willing to lend to the Exchange to stabilise the system of transactions.[64] The modern-day Bank remains central to interbank clearing and both national and international securities settlement systems.

The key and related function of emergency liquidity provision to the banking system also evolved in the later 19th century as the banking system became much larger, more centralised around the 'joint-stock banks', and indeed more global in reach. More specifically, the Bank's role in this regard emerged as a result of two crucial and potentially systemic banking crises threatened

[61] The Scottish clearing banks to his day continue to issue sterling under the guidance of the Bank of England; the same applies to Northern Ireland.
[62] See http://www.bankofengland.co.uk/publications/Documents/events/payments/settlement.pdf, p. 10 accessed 10-03-2014.
[63] Ibid. p. 12.
[64] De Cecco 1984: 99.

the City's markets and financial institutions: the collapse of Overend-Gurney in 1866 (but with liquidity provision to prevent others from going down), and the rescue of Barings in 1891.[65] Likewise, it was discovered that the Bank's interest rate could be manipulated to affect the level of gold reserves and international capital flows into the City, compensating for balance of payments problems of capital flight in a panic ('5% in the City will draw gold from the North Pole, 10% from the moon').[66] In this sense, early experimentation with what we would now call monetary policy was initially developed as an instrument for ensuring financial stability rather than affecting the rate of inflation, which under the Gold Standard was restricted by controls on note issuance.

The informal but powerful system of emergency liquidity provision slowly evolved in the 20th century into the bank resolution regime and system of prudential oversight that we know today, the last two of the OFA criteria. Until the secondary banking crisis of the 1970s, these relationships and functions remained informal and were practiced when necessary. Statutory provision emerged from the late 1970s and became more formalised with the Big Bang of the 1980s and the expansion of the City markets on a global scale. Imperfections in this system of prudential oversight have been associated with the global financial crisis of 2007, and the resolution regime underwent rapid development at the same time as a result of bank failures unprecedented in UK 20th century financial history. But however impromptu the resolution regime, combined with large-scale emergency liquidity provision, has worked and financial stability was restored in the face of a crisis the scale of which was heretofore unknown.

In sum, the UK's financial system began its three hundred-plus years of incremental fulfilling of the OFA criteria in response to the needs of the Crown, of the banking system, to the process of national economic and financial integration, and to regular episodes of financial crisis. This began with the founding of a public debt management system in the guise of the Bank of England, which established itself as the core of the banking system and financial markets. Arguably this led to the emergence of a common risk-free asset, the notes and government paper issued by the Bank that could be relied upon by the financial system in times of distress. This OFA criterion was confirmed with the 1844 Bank Charter Act and the establishment of the Gold Standard sterling issuance monopoly. In turn, clearance and settlement systems, with the Bank as eventual settlement agent, were established over time.

The internationalisation and growing complexity of the London financial markets in the later 19th century saw the establishment of nascent forms of financial oversight, liquidity provision in distress, and the macro-prudential use of the discount rate to stabilise capital flows and

[65] De Cecco 1984: ch. 5.
[66] De Cecco 1984: 103-126.

macroeconomic imbalances. The 20th century, with two World Wars, the Depression, and the nationalisation of the Bank in 1946, saw the steady development and formalisation of these criteria, including (more or less!) an orderly bank resolution mechanism that proved its worth in 2007-09. The final point is to note that the issues addressed by our OFA criteria emerged before the UK government developed or even thought of such policy tools as fiscal transfers to address the internal adjustment and regional disparity concerns of optimum currency area theory. OCA concerns were largely post-Second World War phenomena; the need to stabilize financial market integration came first.

The United States

The case of the United States follows similar crisis-governance dynamics but a very different trajectory and order in establishing adherence to the criteria. The US began and grew from a series of disparate colonies with very different economies, often with more linkages to the outside world than to each other, to unite through war and henceforth conquer or purchase French, Spanish, Mexican, Russian, and of course aboriginal territories. Thus parallel to the initial integration stimulated by independence from the UK, there was a process of constant geographical expansion. This meant that the US emerged as a series of financial geographies that in the 20th century increasingly became one. Furthermore, the country emerged as and has remained politically a federal entity. The provincial or 'state' level as it came to be called long maintained (and preserves some) prerogatives in the domain of monetary and financial governance, though these have diminished over time. It also meant that the means of institutional co-ordination and the clear establishment of jurisdictional prerogatives were under constant contestation. Despite the aspirations of the federal government and much periodic effort at institution-building, only in the early 20th century could one seriously claim that the features of monetary union had been properly developed. This combination of scale, expansion, diversity, and federalism meant that the United States fulfilled (and indeed fulfils) to a far lesser degree the criteria of an Optimum Currency Area than the smaller, more centralised UK. Given that the economic integration and the emergence of a high degree of capital mobility across the territory also happened over time in a context of institutional fragmentation and highly decentralised monetary issuance, the emergence of OFA criteria also faced considerable challenges but preceded most of the features of the OCA recipe.

Economic integration and financial development took off from the 1850s as industrialisation took root. The consolidation of national monetary and financial governance had to await the 20th century to begin in earnest. It was a long wait characterised by a great deal of monetary and financial instability. Although a system of effective governance has since come to greater fruition,

the fulfilment of the criteria remains to this day less perfect and more variegated than in European historical examples. But as in the UK case, monetary union, sovereign debt management, and the governance of capital mobility (as the banking and financial systems became more integrated and complex) were integral to the provision of growing degrees of stability in financial market integration.

The first step in the fulfilment of the OFA criteria consisted of several attempts to establish a predominant and stable federal currency instrument that could serve as a risk-free asset available for a flight to quality in times of distress. Hamilton's early central bank, the Bank of the United States, worked well but did not last beyond its initial congressional mandate.[67] Beyond that experiment, the United States had a common currency unit – the dollar – but not a common currency, because bank notes were issued by private banks chartered by state governments.[68] Up to the 1850s, foreign coins formed the majority of the money in circulation.[69] Despite a constitutional prohibition on the issuance of any paper currency by state or federal authorities, and a clause restricting coinage to the federal instance, state and private currency note issuance made up a lot of the rest.[70] There were literally thousands of different state and private banknotes in circulation.[71] Understanding which money was worth what was a tall order. The Civil War led to another attempt in 1863 to set up and enforce a single national currency that was also less than fully successful, foundering in constitutional controversy and massive inflation.[72] At last the Supreme Court succeeded in reversing the constitutional ban and established a prohibition on competition with federal currency and coinage, yet this took decades to become effective.[73]

The Gold Standard Act of 1900 definitively established the gold dollar as a national monetary standard (at least until the Great Depression and the global abandonment of gold in 1932).[74] This came as a reaction to serial episodes of crisis, depression, and instability during the 1890s and was a milestone along the road to producing a common risk-free asset that was accepted across the economy. Nonetheless, of itself it failed to prevent the crisis of 1907 – which included a collapse of the private clearing system – and financial stability remained elusive as the economy developed and integrated both nationally and globally.[75] If the crisis of 1907 proved a turning point, it was not

[67] Galbraith 1975: 81-2.
[68] Sheridan 1996.
[69] Helleiner 1999: 315-6.
[70] Galbraith 1975: 77.
[71] Zelizer 1999: 83, Helleiner 1999: 320-10.
[72] Helleiner 1999: 320, Zelizer 1999: 84.
[73] Galbraith 1975: 78, Zelizer 1999: 85-7.
[74] See (Zelizer 1999: 85); a first attempt had been made in 1853 (Helleiner 1999: 313), but this ran into the small problem of the Civil War and the suspension of convertibility; convertibility was re-established in 1879 but problems of stability and confidence remained as gold and silver coinage continued to rival each other whilst their mutual exchange rate remained commensurately volatile.
[75] Bruner and Carr 2007.

until 1914 when the Federal Reserve Board and its twelve regional Reserve Banks opened their doors that the matter was properly settled.[76] Given the plentiful availability of foreign examples illustrating the benefits of central banking, the U.S. had learned its lessons the hard way.

This slow process of developing a viable national currency was linked to the emergence of an adequate system of federal government debt management. The process started soon after the Revolution with the assumption of state debt obligations by the federal Treasury. However, it took almost half a century for the Treasury to establish a clear distinction between national and sub-national debt instruments – with the implication being that sub-national government bonds (states and cities) could default, and they did.[77] Once that rule was established, and federal debt achieved supremacy as the primary risk-free, interest-bearing asset in circulation, the challenge was to link sound debt management to a stable monetary policy.

The establishment of the Federal Reserve System effectively accomplished both tasks at once. The dollar thus became the undisputed national currency, backed by Treasury guarantee. The amount of currency in circulation was determined by the Open Market Operations of the reserve banks and was thus no longer subject to government manipulation. Debt was issued by private placement and eventually Treasury auction with the investment banks as underwriters. Furthermore, the new system allowed the Reserve Banks to purchase any form of notes, bills, bonds, commercial paper or other securities: foreign or domestic, private or public. This permitted intervention in times of distress for the stabilisation of the banking system or, for that matter, public authorities should the Board or individual Reserve Banks so choose.[78] The establishment of the Federal Reserve System was thus the culmination of a long and disjointed process of monetary and financial centralisation

Although practice took time to develop, the 1913 Act had initiated or consolidated two of our first set of criteria: a common risk-free asset was in place along with a sound system of sovereign debt management. Each provided the needed collateral to the rapidly-integrating financial system. Elements of the second set of criteria were also in place (at least potentially) – including intervention mechanisms for times of sovereign (or other public authority) distress. The 1913 Act passed by Congress also permitted banks to hold accounts with the regional Reserve Banks. This provided the means to fulfil two more of the OFA criteria. These accounts came to be used for clearance and settlement in the financial system, and the service was in 1917 extended to non-member banks as well. Despite its decentralised institutional form, the Federal Reserve System thus

[76] D'Arista 1994.
[77] Henning and Kessler 2012.
[78] D'Arista 1994: 15.

became the functional equivalent of a central clearance and settlement counterparty.[79] This replaced the system of private clearing houses that had proved less than robust in a range of crises in the 1890s and early 1900s. The fact that member banks of the Federal Reserve System had accounts with the Reserve Banks also permitted the provision of emergency liquidity to the banking system in times of distress.[80] This excluded the very large number of state-chartered and non-member banks, but it was a start. The experience of massive bank failures during the Great Depression spurred the development of this function: the 1933 and 1935 Bank Acts provided deposit insurance (the FDIC) and initiated a system of systematic prudential oversight that has been extended and improved steadily over time. Yet it was a long time before it could be claimed that a genuinely common framework for financial supervision and prudential oversight was operating in relation to even the large, systemically important banks.

Thus over time, from the Depression to the most recent financial crisis, the powers of the Federal Reserve and other federal agencies in terms of supervision and support in times of financial crisis have increased, and the sophistication of intervention mechanisms have been considerably refined. Yet the system of liquidity provision and prudential supervision remained and still remains far from unified: full banking union there is not. A range of financial institutions remains excluded or under state or other federal agency supervision to this day, wherein co-ordination and monitoring problems continue to plague the efficiency of the system of financial supervision.

The Savings and Loans crisis of the late 1980s revealed how costly this could be to the taxpayer – small savings institutions known as 'Thrifts' were overseen by a variety of mechanisms with competing systems of deposit guarantees that were poorly co-ordinated and in the end, ineffective and open to manipulation and influence from the financial institutions themselves. The simultaneous existence of federal and state-level charters with different mechanisms for deposit insurance, prudential oversight, and banking resolution was a major source of uncertainty. Once the major thrifts got into trouble, they immediately threatened to undermine both state finances and the local economy. Moreover, the longer federal authorities attempted to ignore the problem, the more expensive the eventual bailout became. In the end, the federal government had to create an ad hoc resolution authority to finance the liquidation of failing institutions and to make sure that small (and brokered) deposits were made whole.[81] This action strengthened the centralization of U.S. banking authority. It did not, however, completely resolve the dilemmas that U.S. financial

[79] (http://www.federalreserve.gov/pf/pdf/pf_7.pdf) accessed 10-03-2014.
[80] Bernanke 2000: 44-45.
[81] Day 1993, Mason 2004.

regulators had to face. The resolution regime for banks and financial institutions remains fragmented, which is a potential source of instability.[82]

Federal intervention reached unprecedented levels during the 2007-09 financial panic: the exceptional TARP legislation passed by Congress under duress in 2008 provided the Federal authorities with the required powers and financial firepower to rescue a wide range of large and medium (regional) commercial and universal banking institutions that were linked to the housing market and global securities and derivatives trading. It remains the case that some of the largest financial institutions in the U.S. are non-bank corporations. Several forms of trading entities (Special Purpose or Investment Vehicles) turned out to be outside the orbit of the system of supervisory monitoring and enforcement. The Dodd-Frank Act of 2010 is slowly being implemented with a view to addressing a range of these ongoing difficulties.

In sum, the financial system of the United States fulfils the OFA criteria but only imperfectly – indeed less perfectly than in the case of the UK or Canada for that matter (see below). In terms of supervision and resolution, agency competition was not addressed in the post-crisis reforms. Co-ordination problems among multiple agencies responsible for different sorts of financial institutions remain. The resolution and workout of the public debt problems of municipalities and the states of the Union is essentially treated in the same way as corporate insolvency. The bankruptcy of public agencies continues to plague the economic growth and development of those regions worst affected by the crisis and recession.

Canada

At first glance one would expect the Canadian case to share much with that of the United States. Also a product of British colonial settlement, Canada emerged from separate and economically distinct colonies with their own respective trading links and monetary traditions. Foreign monetary instruments dominated the early economic development of all and this continued for some time.[83] Economic and financial integration developed slowly across a vast and expanding territory that was and remains sparsely populated in relative terms. Canada was also a federal state with important powers attributed to the provincial level. The contestation of federal and provincial jurisdictional prerogatives has been a constant theme of political conflict from Confederation onwards. The country as a monetary union is also very far from fulfilling the conditions of an Optimum Currency Area, and adjustment pressures have hit regions differentially. In short, scale and diversity might

[82] Geithner 2014.

[83] For example, British and US coins circulated in the Canadian provinces even after Confederation, and US coins are still taken at equivalent face value in Canadian retail trade.

well have dictated problems of co-ordination, institutional fragmentation, and hence persistent monetary and financial fragmentation.

Yet Canada provides in important respects a contrasting case to that of the United States.[84] The country moved with a great deal more ease towards fulfilling the OFA criteria and providing financial stability for its citizens. This was so for a number of reasons. One reason had to do with the banking system. Despite a range of small local and regional banks in colonial times, large banks with comprehensive branch networks emerged fairly early on after Confederation. This has since developed into a stable oligopoly of the 'big five' with a small number of regional banks and somewhat more numerous but very local mutual credit co-operatives.

In short, public authorities had a ready banking sector interlocutor for the development of the OFA criteria as instability provided incentives to do so. Securities markets remained small and regional in relative terms until the late 20th century, if important to Toronto, Vancouver and Montreal as financial centres, and therefore seldom proved a source of major financial contagion.[85] Secondly, the country demonstrated a stronger long-term commitment to the rigours of the Gold Standard, reinforcing the risk-free nature of government paper and the currency. Thirdly, the Federal government was endowed by the act of Confederation with greater and clearer powers in relation to the governance of both money and banking, certainly compared to the US case. The federal government also proved willing to use them over time. Finally, these factors were mutually reinforcing. Establishing a national currency was somewhat less than straightforward in political terms but was a far less chaotic and protracted process than in the U.S. case, as was the regulation and support of the banking system. In terms of financial governance, if political agreement between the major banks and the federal authorities could successfully be reached, then responses to the problem of financial instability could be forthcoming with relative ease. Despite persistent resistance on the part of the banks to government encroachment, episodes of crisis and war combined with popular pressures reinforced the federal government's hand in the matter.

Although Canada did not have a single and an unquestioned paper currency issue until the 1940s, the country was not far off the mark of fulfilling the first OFA criterion (common risk-free asset) from Confederation onward.[86] Following the failed but politically destabilising revolutionary movements of the 1830s, what are now Ontario and Quebec were united through the 1840 Act of Union as the Province (colony) of Canada. Much of their foreign trade was with the neighbouring

[84] Bordo, Redish, and Rockoff 2011.
[85] Partly because of the dominance of the banks in finance, and partly because of the proximity of the U.S. markets centered on New York, where Canadians could raise capital on a global scale; earlier, London had fulfilled this function.
[86] Gilbert 1999: 27.

United States as well as the UK. A range of "rubbish" coins and notes circulated in the territory.[87] The first issue was decimalisation versus the British system of pounds, shillings and pence. The colonial master was not at all enthusiastic about this idea. Yet decimalisation happened under the impulse of governors-general of the colony. In the Atlantic provinces (most specifically New Brunswick), similar moves were under discussion.

By the promulgation of the 1853 Currency Act in the Province of Canada in 1854, 'Canada' and New Brunswick had adopted a *de facto* decimalisation of the currency while the sterling system also remained valid for Province of Canada government accounts.[88] The 1853 Act also initiated a Gold Standard regime backed by government securities and gold reserves that provided for a greater degree of stability.[89] When the separate colony of Nova Scotia also opted for decimalisation in 1860 (albeit, and awkwardly, at a different exchange rate to the US dollar and sterling), most of what was to become Canada had adopted a monetary system that was largely compatible. Foreign currencies with the exception of small denomination US dollar coins were steadily removed from circulation.

Meanwhile, during the 1850s and 1860s a string of banks that issued private banknotes failed in scandalous circumstances.[90] This accelerated the move towards a single paper currency standard despite the resistance of the banks that profited from their own issuance activities, not to mention the opposition of the British Treasury.[91] Provincial notes were issued, but Confederation in 1867 was the real breakthrough. The country was now free of UK Treasury opposition, and the federal government had new and impressive powers relating to the chartering of banks and the management of government debt securities: exclusive jurisdiction over currency and banking.

The Bank Act of 1870 (revised 1871) established a federal currency, the Canadian dollar, and notes were issued by both the government and the banks. Private banknotes were steadily rescinded over time, starting with the larger denominations.[92] The Bank Act also meant that all banks steadily came under a federal charter, regulation and bankruptcy procedures.[93] The banking system began a process of steady consolidation across the new country as the frontier expanded north-westwards. The management of the government debt and business was carried out by the Public Debt Division of the Ministry of Finance under the guidance of the Treasury Board (a cabinet committee with a ministerial-level President). It was conducted through the major banks, particularly the Bank of Montreal, which fulfilled some of the functions of a central bank by acting as the government's

[87] Gilbert 1999: 28.
[88] This option was quietly abolished in 1857 (Powell 2005: 25)
[89] Helleiner 1999: 313.
[90] Powell 2005: 26.
[91] Gilbert 1999: 31.
[92] Gilbert 1999: 32.
[93] Powell 2005: 27-28.

fiscal agent.[94] The institutions of the Gold Standard, while frequently harsh in terms of economic adjustment, provided for monetary stability and confidence in government finance and the currency.

Even though some banks were permitted to issue notes until the 1940s, Confederation and its immediate aftermath had seen the *de facto* steady fulfilment of three of the OFA criteria for financial stability. A common risk-free asset with a fixed external value was in circulation, underpinned by the Gold Standard and government securities. The larger banks and the Canadian Bankers' Association in the late 19th century took the lead in providing a well-organised and national system of ten clearing and settlement system houses.[95] Government securities served as collateral to the banking system and the centralised system of debt management was certainly sober despite the considerable needs of the new nation. It helped that the economy was small in relative terms. Common procedures for the orderly resolution of banks were in place, and regulation and moral suasion guided the emerging bank oligopoly in the direction of stability. If anything it was the domestic economy that took the adjustment strain of this sober version of financial management and the largely deflationary Gold Standard.

Something was bound to go wrong and it did: the First World War. The risks to the financial system grew as gold withdrawals induced a rising sense of panic in the run-up to war. Gold convertibility was suspended on the declaration of war, and government borrowing would increase dramatically. The government worked closely with the Canadian Bankers Association and the risks were mitigated through the rapidly passed 1914 Finance Act, which instituted another of the OFA criteria: formal lender of last resort facilities to the banking system that were activated via the Treasury Board.[96] Canada avoided bank failure almost entirely, and this record continued through the Great Depression of the 1930s and well into the post-World War II period. The one banking failure that did occur (Home Bank in 1925) resulted in a new and reinforced system of prudential oversight centred on the Office of the Inspector General of Banks (deposit insurance would have to wait until 1967). By 1926 Canada was back on the Gold Standard.

---

[94] Norman, Shaw and Speight 2011: 19; Perry 2012/1898.

[95] Norman, Shaw and Speight 2011: 11-12; 19. Settlement was from 1927 centralised in the Royal Trust Company of Montreal and clearing and settlement functions were eventually taken over by the new central bank, the Bank of Canada, in 1935. Meanwhile the modest securities markets were cleared through hybrid arrangements involving the exchanges, the banks, and private self-regulatory associations (SROs) of securities dealers. From 1970, these securities markets clearing and settlement arrangements were formalised by statute and centralised in the Canadian Depository for Securities, now a for-profit corporation owned by the chartered banks, the TMX exchange, and the Investment Industry Regulatory Organisation of Canada (an SRO), operating under the oversight of the Bank of Canada and the relevant provincial securities regulators: http://www.bankofcanada.ca/core-functions/financial-system/oversight-designated-clearing-settlement-systems/clearing-and-settlement-systems/ (accessed 19-06-2014).

[96] Powell 2005: 37-39.

However, the pressure of War, debt, economic development, and eventually depression increased the need to centralise a range of OFA functions in a proper central bank. Once the Gold Standard was definitively abandoned in 1931, a new mechanism for exchange rate and monetary policy was also necessary. The Bank of Canada Act was passed in 1934 despite the opposition of the banks and it opened for business in 1935.[97] The new bank brought together debt management, monetary policy, foreign exchange reserves, clearing and settlement functions, and liquidity support for the banks and the sovereign (including the provinces). Federal or 'Dominion' notes were replaced by new Bank of Canada issue, which was followed by the suppression of the last of the private banknotes in circulation. Additions to the supervisory armoury came in 1967 in the form of deposit insurance that was extended to credit unions and mutual societies in the 1980s. Following two small regional bank failures in the 1980s and an acceleration of cross-border financial integration, a new financial supervisor was formed in 1996 combining insurance, banking, and securities markets oversight (with Bank of Canada and Finance Ministry support), the Office of the Superintendent of Financial Institutions or OSFI. Remarkably, Canada experienced no bank failures in the global financial crisis of 2007-09. Canadian banks were not immune to cross-border financial pressure, but they were embedded in a regulatory environment that provided ample liquidity and encouraged conservative risk management.[98]

To summarise, relatively early in its financial history Canada established a common risk-free asset, a system of debt management, and federal bank charters and regulation. This centralisation of functions was driven by the negative experience of monetary pluralism, episodes of financial failures, a desire to build a new and more integrated national economy as the territory expanded from five to ten provinces, and as a result of the new federal powers over banking and the currency. No doubt the close proximity of the US as a salutary example stimulated this process from time to time.[99] The experience of war, depression, and minor bank failures led to considerable refinements in the system, including the establishment of a proper central bank in 1934. But the founding of the Bank of Canada in 1935 represented merely the rationalisation and reorganisation of several of the OFA criteria, not their instigation. As the financial system matured over time, improvements in financial regulation and deposit insurance saw the foundation of new federal agencies and the further centralisation of the architecture of financial stability. These developments made it easier for Canadian officials to deal with interlocking national and global market geographies. Canada

[97] Powell 2005: 48.
[98] Arjani and Paulin 2013.
[99] Indeed one of the principal motivations for uniting the provinces at Confederation was the perceived threat of the post-civil war United States and the negative economic spillover that the war had caused on the other side of the border.

arguably fulfils the OFA criteria as well as any national financial system today and better than the other two cases examined here.

Conclusion: Political Realities and Policy Implications

This article concludes by relating the OFA theory and criteria to the problems of cross-border financial integration, drawing out the policy implications for regional and global financial governance. If policymakers in the national cases we have analysed found it difficult to stumble towards the fulfilment of the OFA criteria, this process is yet more difficult in the international domain. Yet contemporary capital markets are global in important respects and market integration at the (multi-national) regional level is becoming increasingly prominent. This means that within the bounds of political realities policymakers working at the international level will have to stumble toward the fulfilment of the OFA criteria as well – because stabilizing global financial market integration is a policy imperative.

The provision of stability for integrated global financial markets is a familiar problem to macro-economists who study 'sudden stop' dynamics. These are situations where capital flows from wealthy industrialized economies into developing countries during periods of relative stability only to surge back out again once international market participants lose confidence in developing markets.[100] The result is a balance of payments crisis for the developing countries coupled with the prospect of financial collapse and sovereign debt default. The Latin American debt crises of the 1980s were an early illustration of this dynamic; the 1995 Mexican crisis, and the 1997-1998 Asian and Russian crises reinforced the lesson. Historically, the solution for developing countries was either to limit the process of capital market liberalization or, where capital markets were already open, to complement liberalized capital markets 'with iron clad rules that make the country resemble a region of a stable country (Argentina's Currency Board is a good example)'.[101]

Unfortunately, the 1998-2002 crises in Argentina revealed that purely domestic institutions are not enough. Indeed, it is likely that the dollarization of the Argentine economy made matters worse. The Argentine government could not save itself without putting Argentine banks and non-financial enterprises at risk and it could not save the banks without undermining its own fiscal accounts. Once 'some type of debt restructuring became inevitable', international confidence in Argentina evaporated and 'a bank run [in Argentina] materialized as a corollary of the Sudden Stop'.[102] Thus both regional and global systems of financial governance should examine and learn from our analysis of the conditions required to provide financial stability in a context of cross-border market

[100] Calvo 1998.
[101] Calvo 1998: 48.
[102] Calvo, Izquierdo, and Talvi 2003: 6.

integration. The closer regional or global institutions of governance can come to fulfilling the criteria, the greater the degree of stability there is likely to be.

The problem is that each of the institutional arrangements implied by the criteria for optimum financial areas is politically controversial both within countries and between them. The controversies can be subtle, as in the case with those criteria related to the technical substructure of markets, or they can be obvious, as with the criteria for financial market stabilization and the 'who pays' question that is central to distributional conflict over banking resolution. All that matters is that the difference in preferences across actors is great enough that they would rather accept the risk of financial volatility than compromise on a shared institutional framework. Yet our analysis reveals that any progress towards a more integrated financial market geography will make these contrasting preferences increasingly costly.

A shared 'risk free' asset is a good example because it gives a liquidity advantage to whomever borrows with that instrument. The provision of common institutions for clearing and settlement, as well as common provision of depository facilities, is another point of controversy. Such institutions not only require some access to risk free assets in dealing with counterparties from different countries but they also need a backstop of their own insofar as such centralized counterparties become nodal points for systemic risk. The tension that emerged between the Italian government and LCH Clearnet over the use of Italian sovereign debt instruments as collateral is one illustration; the close relationship between Clearstream and Deutsche Börse is another.

The debates over prudential oversight, lender of last resort provision, and bank (and sovereign) resolution mechanisms are more obvious because the distributive implications are more self-evident. Governments do not wish to surrender their close relations with home financial institutions; they do not want to accept conditional liabilities for 'mistakes' made in other countries (but which may indeed be caused by the investment decisions of their own domestic banks); and they do not want to be told how to distribute losses across creditors or how to consolidate their own finances. Of course there are moments when governments have to accept such tutelage during the heat of a crisis. Nevertheless, that fact makes them no more willing to surrender these privileges once the immediate threat of crisis begins to dissipate.

Here the European debate on banking union is instructive. Most importantly, Eurozone countries have yet to accept the outcome as collectively generated through their own deliberate policy of financial market and monetary integration. Collectively generated costs need to be shared if financial stability is to result. Many of the reforms initiated during the crisis and based on the understanding of optimum currency area theory indeed militate in the opposite direction,

reinforcing a per-country architecture that only raises the costs for the vulnerable and diminishes the available benefits of financial integration for all involved.

The reality of controversy, however, does not justify the abandonment of effort and new thinking. Even if countries are unlikely fully to adhere to the criteria for optimum financial areas either domestically or in their regional arrangements, it is still worth identifying both the preconditions for stable financial integration and the costs of non-conformity. This suggests a two-pronged research agenda. On the one hand, it is important to elaborate the criteria for optimal financial integration in greater detail in order to test the contribution of specific arrangements to financial stability. On the other hand, it is important to examine just how closely individual countries or groups of countries approximate the criteria for an optimal financial area. This will not only help policymakers to identify opportunities (and obstacles) to productive reform, but also aid in assessing the implications of inactivity. Governments are free to choose the institutions that best fit their preference but they should do so in full awareness of the attendant risks.

References

Abiad, Abdul, Daniel Leigh, and Ashoka Mody (2009). 'Financial Integration, Capital Mobility and Income Convergence.' *Economic Policy* (April) pp. 241-305.

Arjani, Neville, and Graydon Paulin (2013). 'Lessons from the Financial Crisis: Bank Performance and Regulatory Reform.' *Bank of Canada Discussion Paper 2013-4*. Ottowa: Bank of Canada (December).

Bayoumi, Tamim, and Barry Eichengreen (1993). 'Shocking Aspects of European Monetary Integration.' In Francisco Torres and Francesco Giavazzi, eds. *Adjustment and Growth in the European Monetary Union*. Cambridge: Cambridge University Press for CEPR, pp. 193-240.

Baele, Lieven, Geert Bekaert, Koen Inghelbrecht, and Min Wei (2013). 'Flights to Safety.' *NBER Working Paper No. 19095*. Cambridge: National Bureau for Economic Research (May).

Beber, Alessandro, Michael W. Brandt, and Kenneth A. Kavajecz (2009). 'Flight-to-Quality or Flight-to-Liquidity? Evidence from the Euro-Area Bond Market.' *The Review of Financial Studies* 22:3, pp. 925-957.

Begg, Iain (2009). 'Regulation and Supervision of Financial Intermediaries in the EU.' *Journal of Common Market Studies* 47:5 (November) pp. 1107-1128.

Belke, Asgar, and Christian Dreger (2011). 'Current Account Imbalances in the Euro Area: Catching Up or Competitiveness?' *DIW Discussion Papers No. 1106*. Berlin: DIW (February).

Bernanke, Ben S. (2000). *Essays on the Great Depression*. Princeton: Princeton University Press.

Bijlsma, Michiel, and Jasper Lukkezen (2012). 'Target2 of the ECB vs. Interdistrict Settlement Account of the Federal Reserve.' Brussels: Bruegel (6 March).

Blanchard, Olivier, and Francesco Giavazzi (2002). 'Current Account Deficits in the Euro Area: The End of the Feldstein-Horioka Puzzle?' *Brookings Papers on Economic Activity*, pp. 147-209.

Bibow, Jörg (2012). 'The Euro Debt Crisis and Germany's Euro Trilemma.' *Working Paper No. 721*. New York: Levy Economics Institute of Bard College (May).

Bordo, Michael D., Angela Redish, and Hugh Rockoff (2011). 'Why Didn't Canada Have a Banking Crisis in 2008 (or in 1930, or 1907, or . . .)? *NBER Working Papers, No. 17312*. Cambridge: NBER (August).

Bruner, Robert F., and Sean D. Carr (2007). *The Panic of 1907: Lessons Learned from the Market's Perfect Storm*. Hoboken, NJ: John Wiley & Sons, Inc.

Buiter, Willem H., and Anne C. Sibert (2005). 'How the Eurosystem's Treatment of Collateral in its Open Market Operations Weakens Fiscal Discipline in the Eurozone (and what to do about it).' Manuscript (http://www.willembuiter.com/sov.pdf).

Caballero, Ricardo J., and Arvind Krishnamurthy (2008). 'Collective Risk Management in a Flight to Quality Episode.' *Journal of Finance* 63: 5 (October) pp. 2195-2230.

Calvo, Guillermo A. (1998). 'Capital Flows and Capital Market Crises: The Simple Economics of Sudden Stops.' *Journal of Applied Economics* 1:1 (November) pp. 35-54.

---, Alejandro Izquierdo, and Ernesto Talvi (2003). 'Sudden Stops, the Real Exchange Rate, and Fiscal Sustainability: Argentina's Lesson.' *NBER Working Papers 9829*. Cambridge: National Bureau of Economic Research (July).

Can Inci, A., H.C. Li, and Joseph McCarthy (2011). 'Measuring Flight to Quality: A Local Correlation Analysis.' *Review of Accounting and Finance* 10:1, pp. 69-87.

Carmassi, Jacopo, Daniel Gros, and Stefano Micossi (2009). 'The Global Financial Crisis.' *Journal of Common Market Studies* 47:5 (November) pp. 977-996.

Cassimon, Danny, Panicos Demetriades, and Björn van Campenhout (2010). 'Finance, Globalization and Economic Development: The Role of Institutions.' In Geoffrey R.D. Underhill, Jasper Blom, and Daniel Mügge, eds. *Global Financial Integration Thirty Years On: From Reform to Crisis.* Cambridge: Cambridge University Press, pp. 74-91.

Cohen, Benjamin J. (1996). 'Phoenix Risen: The Resurrection of Global Finance.' *World Politics* 48:2 (January) pp. 268-296.

--- (1998). *The Geography of Money*. Ithaca, NY and London: Cornell University Press.

Corden, W.M. (1972). 'Monetary Integration,' *Essays in International Finance* 93. Princeton: Princeton University (April).

D'Arista, Jane W. (1994). *The Evolution of U.S. Finance: Federal Reserve Monetary Policy, 1915-1935.* London: M.E. Sharpe.

Daripa, Arup, Sandeep Kapur, and Stephen Wright (2013). 'Labour's Record on Financial Integration.' *Oxford Review of Economic Policy* 29:1, pp. 71-94.

Day, Kathleen (1993). *S&L Hell: The People and the Politics behind the $1 Trillion Savings and Loan Scandal*. New York: W.W. Norton & Company.

De Cecco, Marcello (1994). *The International Gold Standard: Money and Empire (2nd Ed.).* Basingstoke: Palgrave Macmillan.

De Grauwe, Paul (2010). 'The Banking Crisis: Causes and Remedies.' In Leila Simona Talani, ed. *The Global Crash: Towards a New Global Financial Regime?* Basingstoke: Palgrave, pp. 10-31.

Dellas, Harris, and George S. Tavlas (2009). 'An Optimum-Currency-Area Odyssey.' *Journal of International Money and Finance* 28, pp. 1117-1137.

Diamond, Douglas W., and Philip H. Dybvig (1983). 'Bank Runs, Deposit Insurance, and Liquidity.' *Journal of Political Economy* 91:3 (June) pp. 401-419.

Draghi, Mario (2012). 'Speech by Mario Draghi, President of the European Central Bank, at the Global Investment Conference in London.' Frankfurt: European Central Bank (26 July).

Eichengreen, Barry (1990). 'One Money for Europe? Lessons from the US Currency Union.' *Economic Policy* 10 (April) pp. 118-187.

--- (2012). 'European Monetary Integration with Benefit of Hindsight.' *Journal of Common Market Studies* 50:S1, pp. 123-136.

Epstein, Rachel (2013). 'When Do Foreign Banks "Cut and Run"? Evidence from West European Bailouts and East European Markets.' *Review of International Political Economy* DOI: 10.1080/09692290.2013.824913.

European Central Bank (2014). 'Integration in European financial markets still improved, but still worse than before crisis, new European Commission, ECB reports show.' Frankfurt: European Central Bank, Press Release (28 April).

Feldstein, Martin, and Charlies Horioka (1980). 'Domestic Saving and International Capital Flows.' *The Economic Journal* 90:358 (June) pp. 314-329.

Fleming, J. Marcus (1971). 'On Exchange Rate Unification.' *The Economic Journal* 81:323 (September) pp. 467-488.

Fratzscher, Marcel, Philipp König, and Claudia Lambert (2013a). 'Liquiditätsmanagement des Eurosystems im Zeichen der Krise.' *DIW Wochenbericht 44*. Berlin: Deutsches Institut für Wirtschaftsforschung (30 October) pp. 3-17.

--- (2013b). 'Target-Salden: Ein Anker der Stabilität.' *DIW Wochenbericht 44*. Berlin: Deutsches Institut für Wirtschaftsforschung (30 October) pp. 19-28.

Gabor, Daniela, and Cornell Ban (2014). 'Fiscal Policy in Financialized Times: Investor Loyalty and Financialization in the European Financial Crisis.' Manuscript (March).

Galbraith, John Kenneth (1975). *Money: Whence It Came, Where It Went*. New York: Penguin.

Geithner, Timothy (2014). *Stress Test: Reflections on Financial Crises*. New York: Crown Publishers.

Gianetti, Mariassunta, and Luc Laeven (2012). 'The Flight Home Effect: Evidence from the Syndicated Loan Market During Financial Crises.' *Journal of Financial Economics* 104, pp. 23-43.

Gilbert, Emily (1999). 'Forging a National Currency: Money, State-Building, and Nation-Making in Canada.' In Emily Gilbert and Eric Helleiner, eds. *Nation-States and Money: The Past, Present and Future of National Currencies*. London: Routledge, pp. 25-46.

Goodhart, C.A.E. (2012). 'Global Macroeconomic and Financial Supervision: Where Next?' In Robert C. Feenstra and Alan M. Taylor, eds. *Globalization in an Age of Crisis: Multilateral Economic Cooperation in the Twenty-First Century*. Chicago: University of Chicago Press for NBER (forthcoming).

Gros, Daniel (2012). 'Macroeconomic Imbalances in the Euro Area: Symptom or Cause of the Crisis?' *CEPS Policy Brief No. 266*. Brussels: CEPS (April).

Grossman, Emiliano, and Patrick LeBlond (2011). 'European Financial Integration: Finally the Great Leap Forward?' *Journal of Common Market Studies* 49:2 (January) pp. 413-435.

Hancké, Bob (2013). *Unions, Central Banks, and EMU: Labour Market Institutions and Monetary Integration in Europe*. Oxford: Oxford University Press.

Hardie, Iain, and Layna Moseley (2007). 'Market Pressures, Membership Conditionality, and EU Accession: Turkey's Convergence Tale.' Manuscript (January).

Hartland, Penelope (1949). 'Interregional Payments Compared with International Payments.' *Quarterly Journal of Economics* 63:3 (August) pp. 392-407.

Helleiner, Eric (1999). 'Historicizing Territorial Currencies: Monetary Space and the Nation-State in North America.' *Political Geography* 18:3 (March) pp. 309-339.

Henning, C. Randall, and Martin Kessler (2012). *Fiscal Federalism: US History for Architects of Europe's Fiscal Union*. Brussels: Bruegel.

Hoffmann, Andreas (2013). 'Carry Trades and Speculative Manias: Evidence from Central and Eastern Europe.' *Journal of Post Keynesian Economics* 36:1 (Fall) pp. 15-29.

Honohan, Patrick, and Philip Lane (2003). 'Divergent Inflation Rates in EMU.' In Richard Baldwin, Giuseppe Bertola and Paul Seabright, eds. *EMU: Assessing the Impact of the Euro*. London: Blackwell Publishing, pp. 65-102.

Horvath, Julius (2003). 'Optimum Currency Area Theory: A Selective Review.' *BOFIT Discussion Papers* 15. Helskini: Institute for Economies in Transition, Bank of Finland.

IMF (2013). 'Central, Eastern and Southeastern Europe.' *Regional Economic Issues*. Washington, D.C.: International Monetary Fund (April).

Ingram, James C. (1959). 'State and Regional Payments Mechanisms.' *Quarterly Journal of Economics* 73:4 (November) pp. 619-632.

Johnston, Alison, Bob Hancké, and Suman Pant (2014). 'Comparative Institutional Advantage in the European Sovereign Debt Crisis.' *Comparative Political Studies* DOI: 10.1177/0010414013516917 (January) 30 pp.

Kenen, Peter B. (1969). 'The Theory of Optimum Currency Areas: An Eclectic View.' In Robert A. Mundell and Alexander K. Swoboda, eds. *Monetary Problems of the International Economy.* Chicago: University of Chicago Press, pp. 41-60.

--- (2002). 'Currency Unions and Policy Domains.' In David M. Andrews, C. Randall Henning, and Louis W. Pauly, eds. *Governing the World's Money*. Ithaca: Cornell University Press, pp. 78-104.

Kindleberger, Charles P., and Robert Z. Aliber (2011). *Manias, Panics, and Crashes: A History of Financial Crises*. Basingstoke: Palgrave, Sixth Edition.

Krishnamurthy, Arvind (2009). 'How Debt Markets Have Malfunctioned in the Crisis.' *NBER Working Paper 15542*. Cambridge: National Bureau of Economic Research (November).

Krugman, Paul (1993). 'Lessons of Massachusetts for EMU.' In Francisco Torres and Francesco Giavazzi, eds. *Adjustment and Growth in the European Monetary Union*. Cambridge: Cambridge University Press for CEPR, pp. 241-269.

Mabbett, Deborah, and Waltraud Schelkle (2014). 'What Difference Does Euro Membership Make to Stabilization? The Political Economy of International Monetary Systems Revisited.' *Review of International Political Economy*. DOI: 10.1080/09692290.2014.916625.

Maes, Ivo (1992). 'Optimum Currency Area Theory and European Monetary Integration.' *Tijdschrift voor Economie en Management* 37:2, pp. 137-152.

Martin, Alberto, and Filippo Taddei (2013). 'International Capital Flows and Credit Market Imperfections: A Tale of Two Frictions.' *Journal of International Economics* 89:2 (March) pp. 441-452.

Mason, David L. (2004). *From Buildings and Loans to Bail-Outs: A History of the American Savings and Loans Industry*. Cambridge: Cambridge University Press.

McKinnon, Ronald I. (1963). 'Optimum Currency Areas.' *American Economic Review* 53:4 (September) pp. 717-725.

Mügge, Daniel (2010). *Widen the Market, Narrow the Competition: Banker Interests and the Making of a European Capital Market*. Colchester: ECPR Press.

Mundell, Robert A. (1961). 'A Theory of Optimum Currency Areas.' *American Economic Review* 51:4 (September) pp. 657-664.

Navaretti, Giorgio Barba, Giacomo Calzolari, Alberto Franco Pozzolo, and Micol Levi (2010). 'Multinational Banking in Europe – Financial Stability and Regulatory Implications: Lessons from the Financial Crisis.' *Economic Policy* (October) pp. 703-753.

Norman, B., R. Shaw and G. Speight (2011). 'The History of Interbank Settlement Arrangements: exploring central banks' role in the payment system.' Working Paper no. 412, Bank of England (June). URL https://www.ecb.europa.eu/home/pdf/research/Working_Paper_412.pdf accessed 19 June 2014.

O'Rourke, Kevin H., and Alan M. Taylor (2013). 'Cross of Euros.' *Journal of Economic Perspectives* 27:3 (Summer) pp. 167-192.

Obstfeld, Maurice (2013). 'Finance at Center State: Some Lessons of the Euro Crisis.' *European Economy: Economic Papers* 493. Brussels: European Commission (April).

Padoa-Schioppa, Tomaso (1987). *Efficiency, Stability and Equity: A Strategy for the Evolution of the Economic System of the European Community*. Brussels: Commission of the European Communities, II/49/87 (April).

Pedersen, Lasse Heje (2009). 'When Everyone Runs for the Exit.' *NBER Working Paper No. 15297*. Cambridge: National Bureau for Economic Research (August).

Perry, J. Roy (2012/1898). *Public Debts in Canada*. Toronto: The University Library/Nabu Press.

Powell, James (2005). *A History of the Canadian Dollar*. Ottawa: Bank of Canada.

Posner, Elliot (2007). 'Financial Transformation in the European Union.' In Sophie Meunier and Kathleen R. McNamara, eds. *The State of the Union: Making History – European Integration and Institutional Change at Fifty*. Oxford: Oxford University Press, pp. 139-158.

Reinhart, Carmen M., and Kenneth S. Rogoff (2009). *This Time Is Different: Eight Centuries of Financial Folly*. Princeton: Princeton University Press.

Sanchez, Jose Luis Diaz, and Aristomene Varoudakis (2013). 'Growth and Competitiveness as Factors in Eurozone External Imbalances: Evidence and Policy Implications.' *Policy Research Working Paper No. 6732*. Washington, DC: The World Bank (December).

Sapir, André (2011). 'Europe after the Crisis: Less or More Role for Nation States in Money and Finance?' *Oxford Review of Economic Policy* 27:4 (Winter) pp. 608-619.

Sheridan, Jerome (1996). 'The Déjà Vu of EMU: Considerations for Europe from Nineteenth Century America.' *Journal of Economic Issues* 30:4 (December) pp. 1143-1161.

Tavlas, George S. (1993). 'The "New" Theory of Optimum Currency Areas.' *The World Economy* 16:6 (November) pp. 663-685.

Tett, Gillian (2009). *Fool's Gold*. London: Little, Brown.

Tiffin, Andrew (2014). 'European Productivity, Innovation, and Competitiveness: The Case of Italy.' *IMF Working Paper, WP/14/79*. Washington, D.C.: IMF (May).

Vayanos, Dimitri (2004). 'Flight to Quality, Flight to Liquidity, and the Pricing of Risk.' *NBER Working Paper No. 10327*. Cambridge: National Bureau for Economic Research (February).

Wright, Thomas (2013). 'Europe's Lost Decade.' *Survival* 55:6 (December-January) pp. 7-28.

Wyplocz, Charles (2013). 'Eurozone Crisis: It's About Demand, Not Competitiveness.' Mimeo (January, http://www.tcd.ie/Economics/assets/pdf/Not_competitiveness.pdf).

Zelizer, Viviana (1999). 'A Distant View: Imagery and Imagination in the Paper Currency of the British Empire, 1800-1960.' In Emily Gilbert and Eric Helleiner, eds. *Nation-States and Money: The Past, Present and Future of National Currencies*. London: Routledge, pp. 82-96.

Zysman, John (1984). *Governments, Markets, and Growth: Financial Systems and the Politics of Industrial Change*. Ithaca: Cornell University Press.