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Optimum financial areas: Retooling the governance of global finance

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Abstract

This article analyses the political economy of financial stability under conditions of deep cross-border market integration, adapting the 'joint products' approach of Broz among others. Many argue that financial stability is a public good; we propose that it is inherently excludable and that particular conditions must obtain to ensure it is non-diminishable for all. The difficulties of providing financial stability arise because of the 'club goods' nature of monetary and financial systems. We then propose six institutional preconditions that can stabilise a financial market that is integrated across multiple regulatory jurisdictions. We use case studies of Great Britain, the US and Canada to show how national governments have dealt with these political economy dilemmas to stumble towards similar arrangements to stabilise domestic financial market integration. Three criteria relate to the 'technical substructure' of markets, while three others focus on macro-prudential considerations. Together they constitute necessary and sufficient conditions for the provision of financial stability. These criteria generate political economy obstacles both individually and as an interdependent package but can mitigate the costly dynamics of financial market disintegration in times of crisis. We argue that these criteria can be applied across national boundaries as well as across regulatory jurisdictions within them.

KEYWORDS
capital mobility, club goods, financial geography, financial stability, joint products, market integration, public goods

Despite long experience with both the diversity and common features of frequent financial crises (Reinhart & Rogoff, 2009), humankind seems little closer to resolving the mystery of how to provide financial stability while preserving the dynamism of the financial system. The advent of macroprudential approaches to supervision has not changed the picture fundamentally (Schoenmaker, 2014). Indeed, relatively little in financial governance has changed since the 2007–2008 outbreak of financial crisis and its very long tail in terms of global downturn and troubles in the Euro Area (Baker, 2013; Barredo-Zuriarrain et al., 2020; Helleiner, 2014; Underhill, 2015). Emerging asset bubbles and potentially excessive public and private indebtedness are linked by many to the easy credit born of policies put in place to deal with the 2008 and later Covid-crisis events. As experience in March 2023 with Silicon Valley Bank, Signature Bank, and Credit Suisse has revealed, addressing the problem of future.

Our approach asks the question: under what conditions can economies reap the benefits of financial integration and capital mobility across regulatory jurisdictions without the costs of financial crises—manifest as a subsequent reversal of that same cross-jurisdictional financial integration? Put another way, how can policymakers encourage investors to discriminate between good and bad counterparties in times of crisis rather than engaging in a more generalised flight to safety or a return to home bias? By answering this question, a theory of optimum financial areas (OFA) sheds light on how policy makers can foster the advantages of financial market integration while minimising the risk that market panic will bring all or part of the integrated financial area to a 'sudden stop' (Calvo, 1998).

The article has four parts. The first section distinguishes between financial stability as it relates to the ups and downs of the business (or credit) cycle, versus the disintegration of multi-jurisdictional financial markets, causing one or more of those jurisdictions to experience a 'sudden stop'. This section goes on to explore the collective action dilemmas and the institutions required to hold integrated financial markets together during periods of acute financial instability or crisis. We draw upon and further develop the 'joint products' approach taken by Broz among others (Broz, 1998; Olson, 1965). The literature typically argues that that financial stability is a public good. We argue that the difficulties of providing financial stability for society arise because of the 'club goods' nature of financial systems. This works in two ways: first, regulatory arrangements might provide financial stability to some institutions or stakeholders, but not to others (either 'within' or across jurisdictions: for example, commercial banks versus mutuals or non-bank financials). Second, we propose that—in the context of integrated financial markets—the threat of 'sudden stops' means that those jurisdictions or market segments that experience capital flight are excluded from financial stability as a good. In short, it is only under particular conditions that financial stability in markets that are integrated across multiple jurisdictions is both non-rival and non-diminishable for all. As in the 2008 and subsequent events, the cost of bailouts may be borne by stakeholders or jurisdictions that had little to do with the outbreak of financial instability in the first place.

Section two proposes six 'criteria' that stabilise financial markets that are integrated across multiple regulatory jurisdictions, criteria that overcome the tendency of club behaviour and ensure that financial integration is managed in line with the public interest in stability and the benefits of capital mobility. These institutional arrangements render financial stability non-excludable and mitigate the forces that drive financial market disintegration. Importantly, the criteria we propose do not eliminate the up and down movement in prices and volumes. Hence, they do not eliminate the problem of financial stability altogether. What they do is prevent the sudden withdrawal of capital from one

or more regulatory jurisdictions within an integrated financial market. By implication, 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 necessary to help hold financial markets together that are integrated across multiple jurisdictions, and the synergetic combination of all six should ensure that no jurisdiction experiences a sudden stop as a result of acute financial instability or crisis.

The third section of the article demonstrates through three historical cases of parallel monetary union and financial integration processes both how the criteria work together to support financial markets that are integrated across multiple jurisdictions, and how they nevertheless provoke political opposition both individually and collectively. This section shows how the United Kingdom, the United States and Canadian governments have grappled with the need to develop institutions fulfilling the OFA 'criteria' to underpin financial market integration as their national economies emerged in contrasting institutional contexts. For reasons linked to the political economy of financial (in)stability, none of the examples today properly fulfils all six of the OFA criteria, yet all have managed over time to strengthen financial market integration to varying but relatively high degrees.

These case studies are important for two reasons. The first is that they provide historical parallels for efforts to strengthen financial market integration across national and other regulatory jurisdictions in the European Union. These parallels are not perfect. The European Union does not have the kind of political unity that our case countries possess and neither does it have the same degree of centralised fiscal authority. Nevertheless, the dynamics of financial market disintegration in times of acute financial instability or crisis are very similar, and both political unity and fiscal authority had to be forged over time. The parallel is particularly apt before fiscal policy played any significant role in economic policy in any of our national cases. The parallels are likewise to be seen in the institutional solutions that we find in the EU banking union and capital markets union projects. The case studies are also important because they show that the European Union is not unique in facing political controversy over the institutions that we identify as necessary to underpin financial market integration. Hence, it is hardly surprising that the European Union is not (yet) an optimal financial area—any more than our case countries are.

The fourth section concludes by reflecting on these important considerations and by showing how our approach can be applied to the international domain, which includes the EU. 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. As our cases show, even federal or unitary states fulfil the OFA criteria only imperfectly. Nevertheless, the notion of 'optimality' suggests a direction of travel and so should stimulate better policy.

1 | 'STABILITY', INTEGRATION AND THE GORDIAN KNOT OF FINANCIAL GOVERNANCE

This section seeks to clarify the problem we are addressing with our theoretical framework. First, what do we mean by stability? Second, what does the political economy of the financial sector reveal about why financial stability is so difficult to achieve? These questions admit of two distinct but related discussions: (i) the maintenance of financial integration; and (ii) the issues of moral hazard, 'too big to fail', and capture as specific problems of financial governance in relation to the public good.

1.1 | Financial market integration and 'financial stability'

Much of the existing literature on 'financial stability' is concerned with the broader dynamics that occur when market volatility—meaning ups and downs in volumes and prices—spills over into crisis

(Kindleberger & Aliber, 2005). This problem of financial instability leading to crisis is important in our argument as well. However, as clarified in the Introduction, we focus on the very specific problem that arises when acute financial instability or crisis occurs in financial markets that are integrated across multiple regulatory jurisdictions. Specifically, we are concerned with the moment where external shocks or internal dynamics of the financial sector threaten to break those integrated financial markets apart into distinct jurisdictions as investors flee across jurisdictional boundaries to relative safety, or experience a sudden return of home bias. These flight-to-safety dynamics are important because of the impact they have on those jurisdictions that are left behind.

Hence, while 'conventional' notions of financial stability are important, we are more interested in financial integration and disintegration. Contemporary financial integration consisted of three interrelated and simultaneous developments (Underhill, 1997: 3; 20–21). First, there was a 'de-segmentation' of markets, most notably the distinctions between commercial and investment banking, securities, and debt markets. Particularly where such segmentation was maintained by public or private regulation, this likewise disturbed the club-like relationships between official and private regulatory authorities and their private sector clientele. Second, this greatly increased competition and innovation in this wider financial sector, marketizing historical cartel-like arrangements across financial space. Third, the financial institutions that internalised and responded to these changes began to operate more globally, while national restrictions on capital mobility disappeared. In short, this was a cross-border transnational integration of both firms, market structures, and capital flows.

This financial integration takes place on a continuous spectrum, 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 towards the ideal of perfect mobility. Disintegration moves the other way, as capital retreats back to its home jurisdiction or flees to other safe havens.

Financial market integration is a complex process that involves a broad array of actors in different market segments and regulatory jurisdictions, whether cross-border or not. Governments thus may choose to lower the restriction on cross-border capital flows and to create the conditions for cross-border trade in financial services. With the exception of official transactions, 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 that favour financial integration, then firms should respond to the changed landscape of market incentives much like water responds to a sudden change in the terrain. However, such theoretical predictions do not always work in practice: politicians may relax barriers to cross-border capital flows absent a market response (Feldstein & Horioka, 1980).

The large number of public and private actors involved in financial integration and the continuous spectrum of cross-border financial interaction combine to create a diffuse pattern of agent interaction. Financial integration holds together so long as and insofar as market actors perceive incentives to move capital or maintain investments across borders, financial centres, or market segments; financial integration falls apart (or becomes disintegration) 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, regulatory, 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 (Baele et al., 2013; Giannetti & Laeven, 2012; Vayanos, 2004).

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/jurisdictional capital flows from those that focus on broader macroeconomic conditions or on narrower microeconomic concerns (like country-specific or counterparty risk). Once borders and other barriers are open, capital mobility envelopes participating market systems and their fates become entwined. An economic downturn, monetary policy decision, or a weakened counterparty does not necessarily entail a threat to financial integration although each will likely result in a redistribution of liabilities and assets. Such factors only become problematic for financial market integration insofar as they put the whole practice of cross-border investment at risk and unleash a stampede for liquidity (De Haan & van den End, 2013). In such a context, political will is not enough to resist the forces of disintegration. Instead, policymakers interested in shoring up 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 (Caballero & Krishnamurthy, 2008; Diamond & Dybvig, 1983). The goal of financial governance across regulatory jurisdictions is to render more resilient financial market integration, given the likelihood that market participants (including sovereigns) may fail.

Our theory of optimum financial areas 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 the kind of generalised flight to quality or reassertion of home bias that causes one or more jurisdictions to experience a sudden stop.

1.2 | The 'Gordian Knot' of financial instability

Of course, while we can make a clear analytical distinction between the challenges of addressing financial market stability and shoring up financial market integration, in the real world of policy these things are closely interconnected, and policymakers should want to achieve both goals at the same time. Therefore, we need to build an understanding of policymaking that encompasses multiple objectives. This section first discusses current literature understanding of the emergence of institutions and policies for financial stability as a public good. This is followed by our critical argument that, historically and contemporaneously, financial stability was and is frequently provided for a limited insider club of vested interests and, furthermore, that this makes the problem worse. We therefore begin by focusing on the development of stabilising institutions within a single regulatory jurisdiction and go on to adapt and supplement the 'joint products' approach employed by Broz in his account of contrasting processes linked to the emergence of central banking in the US and UK. We will return to the problem of financial market integration across regulatory jurisdictions later in the section where we demonstrate how democratic accountability began to enhance demand for more inclusive versions of financial stability.

The contemporary debate on financial stability places much emphasis on complexity, yet a stylised understanding of the basic nature of the collective action problem is simple to grasp. Two examples suffice. Firstly, there is a risk–return trade-off across different asset classes, including those across different national economies: safe produces a sorry return, and the more benign the market, the lower those returns are likely to be. The same environment rationalises the build-up of leverage. It becomes perfectly rational for individual investors to seek both greater risk and return. As the frustrations of low returns may induce many do this at the same time, the amount of risk in the financial system may rise and asset bubbles emerge (Minsky, 1982). Secondly, the asset price signals that emerge in this context may enhance inherent procyclical dynamics. The safety of portfolio diversification may soon appear a sucker's paradise as herd behaviour chasing rising asset prices leads to highly correlated risks

across agent portfolios. When these cycles come to an end, debt adds to the distress selling and the collapse of prices may destabilise the banking sector and thus the monetary system.

In short, behaviour that is rational for some is not so for the system as a whole. The result is a dash for liquidity and asset fires sales ensue (Brunnermeier & Pedersen, 2009). Importantly, this dynamic can and does take place across asset classes within a single regulatory jurisdiction. This whole lamentable tale has been related many times (Kindleberger & Aliber, 2005: 22–32). However complex the interplay of investor behaviour, government policy, financial institutions, economic growth and the latest financial innovations, the literature tells us that financial instability is at base a collective action problem. Constraints on agent behaviour are obviously part of the solution.

The standard solution for this disparity between individual and collective rationality is institutions as third-party mechanisms permitting agent co-ordination for mutual benefit (Bates, 1988: 390–1). Where financial instability may have at its origin in, or may place in jeopardy, the finances of the sovereign, the emergence of central banking became historically the classic solution to the problem (Broz, 1998; Goodhart et al., 1994). The emergence of central banking has then frequently been associated with the notion of public goods provision to citizens and other economic agents (Chadha, 2022). While moral hazard may result when market participants take on too much risk in the belief that policymakers and the public will ultimately absorb any related costs in a crisis, this trade-off must be managed through careful institutional crafting.

Bates (1988: 395–6) however astutely observes that the issue cannot rest there. 'The *demanders* of institutions may be unable to secure their *supply*.' Theory goes on to invoke third parties as the solution to the temptations of free riding and perverse incentives, yet unless the proper incentives are in place, there is little to prevent third parties from predatory behaviour. A third party with a vested interest in the outcome is in turn more likely to supply efficient institutions functioning as public goods, yet 'the existence of vested interests does not promote the creation of appropriate incentives (Bates, 1988: 396).' From here the standard argument falls back on Olson's notion of a privileged group with a community of interest providing the public good despite the presence of free-riding: benefits need not be symmetrical (Olson, 1965); the vested interest of banks and the government in financial stability and a functioning monetary system may form a community of interest that underpins the institutional solution to the problem.

Broz (1998: 232–6) takes up this discussion in a critical vein and his solution contrasts with that of Olson, among others: the 'joint products' or 'selective incentives' explanation of the emergence of central banking institutions as third-party providers of public goods that circumvent the problem of free riding. The government supplies a central bank with monopoly privileges, and this is supported by a small insider coalition of creditors in exchange for rents through which this sub-group internalises a substantial share of the benefits of the new institution. The government gains privileged access to finance, and the 'mutual hostages' cartel arrangement eventually and incidentally contributes wider benefits to the public good. This consists of a functioning monetary system, sustainable debt loads, and efficient war-making capacity that a broader public can freely consume, 'thereby resolving the dilemmas that normally constrain the provision of public goods to suboptimal levels' (Broz, 1998: 235–6).

So far so good, yet the model comes under pressure when related to the issue of financial stability as a 'public good' by-product of the operation of the joint products cartel. The rents of the insider coalition skew the incentives away from public goods and towards providing financial stability as an insider benefit. Furthermore, if individual insiders know that they can successfully externalise the costs of the instability their strategies might generate, the temptations of individual rationality and thus of moral hazard may be strengthened considerably.

This leads us to reconsider the issue of moral hazard as well. Notionally, any policy that seeks to address issues of counterparty risk in the interests of enhancing financial stability may generate

moral hazard, with or without our definition of integration. 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 because a process of financial integration is likely to lead to larger and more interconnected financial institutions. However, given that the problem does not disappear, the degree of moral hazard arises from the ways in which regulatory and supervisory systems manage liability and interconnectedness and distribute the costs of potential failure, *not* from a commitment to the stability of financial integration per se.

Furthermore, addressing moral hazard alone will not solve the financial instability dynamics born of (dis-) integration. Addressing moral hazard, like addressing financial stability, depends on the policies and institution that deal with aggregation and collective action because the relationship between moral hazard and instability is different from the 'standard' account in the literature. We argue that the problem intensifies in the presence of the rents of 'exclusionary', club-based financial stability: the collective 'club' rationality of the system becomes more aligned with the risk-taking rationality of individual players precisely because the costs of crises can be externalised successfully. Moral hazard is best dealt with by providing financial stability as a genuine public good in ways that our theory addresses.

Our OFA understanding may be illustrated using Broz's own historical example. Firstly, the Bank of England may have been independent of the government (although as fiscal agent and banker to the sovereign, it was operationally deeply entangled in government finance), but was certainly not independent of its own major 'insider' shareholders and creditors who pushed for the founding of the Bank and its privileges in the first place. Over time the 'Governor and Company' became distinguishable from the small shareholders as none other than the privileged banking elite of the City protected by the Bank's charter and with exclusive access to its monopoly rents and resources in times of crisis. One is reminded that the provision of efficient incentives is inherently problematic when the agents also share in the benefits (Bates, 1988: 396; Holstrom, 1982: 325). In short, the rents were shared by both the government, the 'Company', and the Bank, while the financial instability they might generate could be externalised onto outsiders and the public.

Second, 'insider' or endogenous theories of money (Shubik, 1999) are relevant to the way in which the Bank and its inner circle operated and explain the chronic nature of the financial instability that this produced. As Brunnermeier and Sannikov argue (2014, 2016), 'inside' money means that the distinction between financial assets and liabilities breaks down – all are forms of debt – and thus so does the difference between demand versus supply side players. An 'insider' price of money set by the Bank in turn set the cost of the very leverage that generated money and 'assets' for the cartel in the first place, yielding their fabulous rents. The sovereign and the central bank cartel provided mutual rents based on monopoly issuance that also excluded others. By the same token they *also* created the temptations that fed chronic financial instability. Members all competed for yield (necessarily rivalrous) while holding each other's risky assets, generating latent system-wide risk under apparently stable conditions (Minsky, 1982) and intensifying the sector's 'insider' tendencies.

Thirdly and crucially, they did this in full knowledge that while hardly costless to them, the costs of financial instability would be borne largely by others. Cartel members could rely on the selective deployment of the Bank's resources to survive the very financial turmoil their own incentives created. In this way, financial stability was only very selectively provided and proved to be eminently excludable. Broz himself points this out (Broz, 1998: 248), citing the volatile predicament of country banks outside the magic inner circle of the Bank of England's London cartel. De Cecco's magisterial work on the late nineteenth century gold standard (De Cecco, 1994) makes the same point: the Bank made clear choices between those inside or outside the circle of discount and acceptance houses and cartel banks. The costs of insider-generated instability could be dumped on others.

Importantly, this exclusion exists by dint of regulation and market segments, with or without a cross-border dimension. The regulations define which institutions have access and which do not; they also set out the responsibilities and privileges of the central bank. The Bank aggressively defended its monopoly privileges and used its resources selectively to protect cartel members. In short, the Bank was indeed predatory, using its dominant market position born of issuance monopoly and concomitant position of fiscal agent to dominate and shape the variable geometry of its cartel of client institutions over time. The means employed involved discretionary use of discount rate and repo rates via open market operations as well as of gold and financial flows (Goodhart et al., 1994: 65). There was also aggressive and discretionary use of what came to be called the Lender of Last Resort (LLOR) facility. Thus, while challenger Overend-Gurney (among others) was allowed to fail in 1866, insider Barings in 1890–91 was not (De Cecco, 1994: ch. 5; Hotson, 2017: 106–109). Financial stability outside the inner circle was at best provided incidentally, and when those in the outer orbits of the financial system were able to challenge the market position of the Bank they were brought inside, as in the case of the joint-stock banks in the later nineteenth century (De Cecco, 1994). Meanwhile, the consequences of externalised financial instability were hardly beneficial for the broader public who experienced regular bank failure and a cacophony of private currencies, but the chaos excluded the Bank, the sovereign and the cartel.

It was precisely this shared cartel interest that led to instability—they all had skin in the game. Thus, it seems that the Bank and its inner circle operated far more as a classic economic club wherein the size of the club was relative to the internal benefits and the organisational costs of cohesion (Buchanan, 1965). There were few rents that outshone making money from money. This form of 'insider money' indeed creates a most natural of economic clubs with low organisational costs, easy excludability of outsiders from membership, and *particularly high benefits for members*. The benefits are as endogenous to the club as is money itself. This combination of insider interaction and governance generates both financial instability and the successful transfer of many of its costs to the broader public, even in a democracy.

So how do we proceed from financial stability as a club good as constructed through regulatory distinctions and underpinned by the oligopoly rents of endogenous money (that incidentally produce important side-benefits for the economy as a whole), to the provision of financial stability as integral to our notion of the public good itself? First, we must avoid the separation of the history of the currency from the history of banking (Hotson, 2017: 2), as if banking were about something other than money. If it was not the familiar establishment of 'institutions' as such that led to financial stability as an eventual goal of inclusive public policy, we argue that this was intimately bound up with the emergence of political accountability and, above all *democracy*, that forced these core financial and monetary functions of the sovereign cartel to answer to the needs of citizens (Chwieroth & Walter, 2019a) through different policies.

In this regard we invoke the *new* logic of collective action (North et al., 20092009: 140–142). When the harm caused by the club good of excludable financial stability was linked via 'political open access'[1] to the resulting economic-distributional consequences for the steadily enfranchised, culminating in the Great Depression, the whole nature of financial supervision, lender-of-last-resort, and the operation of the monetary system began to take on the characteristics of public goods (Shaw, 2019) while financial stability began to matter to the broader public in ways that it previously had not (Chwieroth & Walter, 2019b). Political Open Access is the crucial factor in a transformation from private club goods to the emergence of truly national central banking responsible for public good provision. The rules may remain the same, but policymakers are responsible for ensuring that there

[1]The terms for open democratic politics developed in the institutional economics literature; see North et al. (2009).

is equal treatment across regulatory distinctions and for non-financial players as well. The interaction of crisis, the state-finance endogenous money club, and of emerging political open access leads in the right circumstances to a broadening of concerns among policy makers from trying to stabilise the ups and downs in prices and volumes to underpinning the connections between institutions—in this case money-centre banks in London and country banks outside the city—despite their regulatory distinctiveness.

2 | CRITERIA FOR OPTIMAL FINANCIAL AREAS

We now turn to the 'how' of what is to be done and discuss the six criteria for optimum financial areas and their underlying rationale. The criteria we propose are developed and derived directly from the case studies below and the historical practice of national financial governance in dealing with the simultaneous, and related, processes of domestic financial market integration and monetary union. Each country found its own way to an approximate implementation of these criteria as they struggled to extend their concern with financial stability to include the specific problem of underpinning financial integration. As the reader will see, the political economy obstacles to arriving at this common end-point were similar, yet occurred in an order and in ways that were unique to each national case.

We have argued so far that it is important to focus attention on how financial integration and the dynamics of capital mobility interact in moments of crisis, and on who extracts the rents and imposes the costs of instability. 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 (Can Inci et al., 2011; Krishnamurthy, 2009; Pedersen, 2009).

This section introduces our choice of two sets of three criteria that promote the stability of financial geography as defined and outlines how and why they function so. We identified these criteria inductively through historical process tracing. Our strategy was to identify moments in the financial history of our case countries where efforts to respond to acute financial instability or crisis failed to address the problem of capital flight or reassertion of home bias and so left some regulatory jurisdictions exposed to sudden stops. This was easier in the United States and Canada, where states and provinces provided clear jurisdictional boundaries. But we were able to apply the same logic to the British case by looking at the geographic concentration of specific kinds of financial institutions and then combining that with discrete geographic and jurisdictional boundaries—like Scotland and Ireland, or 'city' versus 'country' banks. We then looked at what policymakers did either centrally or in a coordinated fashion across regulatory jurisdictions to try to address what they believed to be the problem.

What we found is that all three of our cases accumulated similar sets of institutional arrangements and policies to address different dimensions of the problem. Each was a combination of institutional and substantive policy innovation. Some of these arrangements strengthened the infrastructure that connects financial market participants across regulatory jurisdictions while others strengthened confidence among market participants that their investments in different regulatory jurisdictions would receive roughly equitable treatment within the same asset classes. We organised those institutional arrangements into six separate functional roles and then identified those policy functions as 'criteria' for holding integrated financial markets together in times of duress.

These criteria will be first defined and then operationalised empirically in this section by analysing their emergence in the context of historical monetary and financial unions. Many of these criteria had been emerging as financial systems matured over time and learned to provide stability for a limited number of players. However, the key point is that they must be both fully developed, fully

co-ordinated across all criteria, and transformed from club good status such that the benefits become properly non-excludable. This requires a conscious shift in the orientation of public policy and in terms of institutional design.

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. 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. centralised 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 stabilisation in times of distress. The issues here concern

i. an inclusive and common framework for financial supervision and prudential oversight that protects the broader public as well as banks;
ii. lender of last resort facilities for financial institutions and, ultimately, the sovereign (monetising debt when push comes to shove);
iii. mechanisms to rationalise expectations in the event of a resolution of either private or public financial entities or both.

Beyond the obvious merits of drawing on the practical historical experience of governance, there are three reasons for selecting these criteria and organising them as we do. The first is functional. These criteria focus primarily on risk management. But they also focus on the policy problem of managing both the flow of capital across (combinations of) market segments, borders, and the cross-border investment stocks that accumulate over time. Those criteria related to the technical substructure of markets seek to minimise 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 recognised and managed as a public good—as with market 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 (Caballero & Krishnamurthy, 2008; Diamond & Dybvig, 1983) as well as ensuring that residual rents and public resources both serve the public goal of non-excludable financial stability.

The second reason has to do with synergies and co-ordination. 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 stabilisation mechanisms. Although there is no unique path to progress, the full achievement of any one additional criterion 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 concerns empirical learning. As our case studies illustrate, national systems of governance that encouraged financial market integration across different competing clubs of 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 and policy framework for financial governance that imperfectly but to a high degree fulfil the criteria we have identified. There was

TABLE 1 Criteria for optimum financial areas.

Function	Criteria	Institutional form
Make market infrastructure more resilient	Common risk-free asset	Currency or sovereign debt
	Central system for sovereign debt management	Treasury or central bank
	Centralised counterparties (CCPs)	Communications network, clearing house, settlement system, depositories
Strengthen confidence among market participants	Common framework for supervision and oversight	Central bank or financial regulatory agency
	Lender of last resort for sovereigns and banks	Central banks or central counterparty
	Predictable resolution of failing institutions	Resolution authority and deposit insurance

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 complex and integrated cross-border markets, to manage counterparty risk and address moral hazard, and that recognise the systemic utilities that are required to underpin the operation of markets. Yet, this incrementalism was part of the problem: residual club behaviour and exclusionary rents remained embedded in new institutions, and the pressures of crisis in emerging democracies were inconsistent in the ways in which they harnessed the old to a newness of purpose. New institutions had to 'see' the problem in new and more democratic ways as well.

Thus, none of these empirical cases yet attains 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 under conditions of non-excludability, each is necessary and the interactive combination of all constitutes a sufficient condition for the achievement of financial stability. (See Table 1).

3 | HISTORY'S LESSONS

This section demonstrates across three national cases how emerging national monetary unions slowly discovered and operationalised 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 (Reinhart & Rogoff, 2009).

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 strengthen financial integration by developing institutions that embed criteria for an optimal financial area. Our theory predicts that as financial integration and capital mobility increases, market agents and policymakers begin to grapple with these problems by creating new systems of governance. Initially they do so in relation to private

interests (e.g. in the financial system) that may oppose the process of reform and the strengthening of governance mechanisms, but above all will engage in exclusionary club rent-seeking. Yet, the costs of financial market disintegration both to governments and to the process of economic development, combined with emerging 'political open access', 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 become important driving forces (Cassimon et al., 2010; Chwieroth & Walter, 2019b).

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 governance.

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 more deeply integrated national financial systems, and these national systems simultaneously developed in a global context. These financial integration processes *also* occurred in symbiosis with the formation of what came to be 'national' monetary unions formed from a range of units. We deliberately chose three 'similar' cases on the dependent variable—outcomes in terms successful provision of financial stability. Specifically, we choose three 'market-based' financial systems with different institutional features but shared historical origins: the United Kingdom; the United States; and Canada (Zysman, 1984). Their shared characteristics are juxtaposed on contrasting institutional features (Broz, 1998): the UK is centralised while the US and Canada are federal with different divisions of powers. Furthermore, and partially as a consequence, each became a monetary union and integrated financial space at a different pace and in different ways.

These 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 Table 2).

3.1 | The United Kingdom

The UK is a prime example of the early 'club goods' 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 (Kynaston, 2017). The Bank initially bore little resemblance to its current 'Central Bank' self. The Bank's £1.2 million in privately subscribed capital was essentially a swap with private creditors 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 independent of the Crown itself, thus containing the impact of sovereign debt on the financial system and economy, but the benefits in terms of stability (not to mention impressive rents) accrued largely to the state and to those with direct access to the Bank.

TABLE 2 Existing OFA institutions.

Criteria	Great Britain	United States	Canada
Common risk-free asset	Pound sterling and Gilts (1833–1844/5)	Greenback dollar and Treasury notes (1914)	Canadian dollar and federal debt (1870)
Centralised Debt Management	Bank of England (post 1694)	U.S. Treasury & Federal Reserve (1914)	Treasury Board /Min. Finance (1867); fiscal agent Bank of Canada (from 1935)
Centralised counterparties	Bankers' Clearing House, CHAPS (post 1864)	Federal Reserve System (1917)	"Gradual from 1867; Bank of Canada accounts and oversight (1935)"
Supervision	FSA and Bank of England (gradual; formalised 1980s)	Multiple agencies (Fed members from 1914; 1930s legislation; ongoing fragmentation)	Office Superint. Fin. Institts. (1996) and Fin. Consumer Agency of Canada (2018)
Lender of last resort	Bank of England (gradual post 1866)	Federal Reserve (poss. for Fed members from 1914; from 1930s depression)	1914 Finance Act; Bank of Canada (from 1935)
Resolution	Bank of England (not formalised until 1980s)	FDIC and ad hoc arrangements (1933 & 1935 bank acts onwards)	1870 Bank Act; Bank of Canada (1935) and Canada Deposit Insurance Corporation (1967)

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. 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 (De Cecco, 1994: 79). 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 (as defined by the Bank itself) 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 inner-circle 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 Scotland had engaged in political union with England in 1707, which by the 1840s became a full monetary union (Chadha, 2022: 20–21). 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 nineteenth 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 of government need on the Bank's reserves during 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 (Chadha, 2022: 18–19). The post-Napoleonic period proved to be one of problematic debt workout, bank failure, financial panic and monetary instability: crisis, in short. Bank failure rendered the notes of private banks worthless; those excluded from the stable orbit of the Bank could only protest, yet there was a clear need for more confidence in the monetary system.

This crisis of confidence 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 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. 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.

Meanwhile, the Bank's role in the markets and its relations with other banking institutions had led to the emergence of a third, as yet exclusive, OFA criterion: a central clearing and settlement system in which the Bank functioned as settlement agent to its circle of finance houses. London interbank clearing had begun in the later 18th century in the Five Bells tavern in Lombard Street, and by the early nineteenth century had evolved into the 'Bankers' Clearing House'. Limited to the London finance and discount houses at first, through access to 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 – a considerable 'democratisation' of several of the criteria as more and more of the public became involved in the erstwhile 'London' financial system. The Bank of England itself joined in 1864, and this development was the direct antecedent of the current CHAPS settlement system.

During this period, clearing was not everywhere the same. 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. 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 (De Cecco, 1994: 99). In this way, the Bank's orbit relative our third criteria encompassed the broader economy, and 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 nineteenth century as the banking system became much larger, more centralised around the 'joint-stock banks', and indeed more national *and* global in reach. More specifically, the Bank's role in this regard emerged as a result of two crucial and potentially systemic banking crises that threatened the City's markets and financial institutions: the collapse of Overend-Gurney in 1866 (but with liquidity provision to prevent insiders from going down), and the rescue of Barings in 1890–91 (De Cecco, 1994: ch. 5). 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 (De Cecco, 1994: 103–126).

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. As the inner circle widened along with the extension of the electoral franchise, the benefits became more widely distributed. As the twentieth century progressed, what had emerged was a broad self-regulatory cartel arrangement that included the Building Societies, led by the Bank, and that was embedded in a set of business practices and conventions constraining the behaviour of its members. These conventions were as central to stability as the lender-of-last-resort facility of the Bank (Coleman, 1996; Hotson, 2017: 4–8; ch. 2).

The informal but powerful system of emergency liquidity provision that was part of this 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. The experience of two World Wars and the Depression that coincided with universal suffrage greatly augmented the responsiveness of the system to popular demands for stability and practice of co-ordination across the six the criteria became more sophisticated—British banks emerged from the Depression unscathed. Nonetheless and perhaps remarkably, until the secondary banking crisis of the 1970s, these relationships and self-regulatory conventions remained informal and were practiced when necessary.

The steady growth of London as a global financial centre and government-driven financial liberalisation in the 1980s would disturb these arrangements profoundly, and financial governance had to be adapted accordingly. Renewed instability under more liberal conditions led to statutory provision from the late 1970s and became more formalised with the Big Bang of the 1980s and the global expansion of the City markets. Imperfections in this system of prudential oversight have been associated with the global financial crisis of 2007, and in the face of panic and bank failures affecting the broader public the resolution regime underwent rapid development unprecedented in UK 20th century financial history. But however impromptu it remains the case that 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. That said, the popular perception that the public pays for bankers' indiscretions intensified and financial stability remains an issue of high political salience.

In sum, the UK's financial system began its three hundred-plus years of incremental fulfilment 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 – all of which ran parallel to the emergence of political open access. 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 nineteenth 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 macroeconomic imbalances. The twentieth century, with two World Wars the Depression, and the nationalisation of the Bank in 1946, saw the steady development of this system into a set of cartelized self-regulatory practices that constrained risk and moral hazard in return for the Bank's resources in times of stress. Liberalisation and global expansion led to the eventual 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 *parallel* to the same popular pressure

on the UK government that led to such distributional policy tools as fiscal transfers. Monetary union worked as long as at least crucial OFA criteria were progressively fulfilled. The club-goods need to stabilise financial market integration came first.

3.2 | The United States

The case of the United States follows similar crisis-protest-governance dynamics but a very different trajectory and order in establishing adherence to the criteria. Establishing institutional leadership and appropriate cartel-like arrangements through which the trade-offs could work – and thus the establishment and co-ordination of the criteria – proved to be much more difficult than in the UK or Canadian case. This had a lot to do with the peculiar workings of federalism in the US. 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 to 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 expansion meant that the US emerged as a monetary mosaic and series of financial geographies shaped by federalism (Broz, 1998) that in the twentieth century increasingly became one (Gorton & Tallman, 2018). 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. 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 twentieth century could one seriously claim that the features of monetary union had been properly developed. Institutional fragmentation also meant that the channels of popular protest and eventual political open access were complex, intersected as they were by the emergence of a high degree of capital mobility and highly decentralised monetary issuance across the territory. The emergence of OFA criteria thus faced considerable challenges.

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 (1791) First Bank of the United States worked well but expired with its initial 1811 congressional mandate (Galbraith, 1975: 81–2). An equally inconclusive Second Bank of the US experiment followed from 1816: renewal foundered on President Jackson's veto and it thus expired in 1836. The United States therefore had a common currency unit—the dollar—but not a common currency, because bank notes were issued by private banks chartered by state governments (Sheridan, 1996). Up to the 1850s, foreign coins formed the majority of the money in circulation (Helleiner, 1999: 315–6). 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 (Galbraith, 1975: 77).

There were literally thousands of different state and private banknotes in circulation (Helleiner, 1999: 310–20; Zelizer, 1999: 83). Understanding which money was worth what was a tall order, and bank failures added to the chaos. 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 (Helleiner, 1999: 320; Zelizer, 1999: 84). 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 (Galbraith, 1975: 78; Zelizer, 1999: 85–7).

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). 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 near collapse of the private clearing system—and financial stability remained elusive as the economy developed and integrated both nationally and globally (Bruner & Carr, 2007). If the crisis of 1907 and popular reaction proved a turning point, it was not until 1914 when the Federal Reserve Board and its 12 regional Reserve Banks opened their doors that the matter was properly settled (D'Arista, 1994). Given the plentiful availability of foreign examples illustrating the benefits of central banking, the U.S. had learned its lessons the hard way (Gorton & Tallman, 2018).

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 independence with the assumption of state debt obligations by the federal Treasury and the First Bank. 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 (Henning & Kessler, 2012). 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 and corresponded to the steady extension of the franchise and political accountability in the country. 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 (D'Arista, 1994: 15). The establishment of the Federal Reserve System was thus the culmination of a long and disjointed process of monetary and financial centralisation.

The establishment of the Federal Reserve was a direct consequence of popular reactions to the panics of the 1890s and of 1907 and a steady democratisation at the federal level. 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 via this nascent 'inner circle' through which these new criteria could work. 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 became the functional equivalent of a central clearance and settlement counterparty (Gorton & Tallman, 2018). 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 (Bernanke, 2000: 44–45). 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. Financial stability was becoming less and less excludable, 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 (Shaw, 2019).

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 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 co-ordinated cartel arrangements of the UK did not emerge, and instability was thus more prevalent.

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, ineffective and open to manipulation and influence from the financial institutions themselves, thus intensifying rent-seeking and moral hazard problems. 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 sub-national 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 (Day, 1993; Mason, 2004). This action strengthened the centralization of U.S. banking authority. It did not, however, completely resolve the dilemmas that U.S. financial regulators had to face. The resolution regime for banks and financial institutions remains fragmented, which remains a potential source of instability (Geithner, 2014).

Federal intervention reached unprecedented levels during the 2007–09 financial panic: the exceptional TARP legislation passed under duress by Congress 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 United States are non-bank corporations. Several forms of trading entities (Special Purpose Investment Vehicles, the infamous SIVs) turned out to be outside the orbit of the system of supervisory monitoring and enforcement. The Dodd-Frank Act of 2010 was then 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 (not banks) continues to plague the economic growth and development of those regions worst affected by the crisis and recession.

3.3 | Canada

At first glance one would expect the Canadian case to share much with that of the United States. Another product of British colonial settlement, Canada likewise 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 provinces and this continued for some time. 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 (1867). In short, scale and diversity might well have dictated problems of co-ordination, institutional fragmentation, and hence persistent monetary and financial fragmentation, yet crucial institutional differences compared to the US led to the early emergence of government-bank cartel-like arrangements that yielded relatively inclusive financial and monetary stability.

Thus, Canada provides in important respects a contrasting case to that of the United States (Bordo et al., 2011). 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 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 cartel-based OFA criteria as instability provided incentives to do so. First, securities markets remained small and regional in relative terms until the late 20th century, if important to Toronto, Vancouver, Winnipeg, and Montreal as financial centres and therefore seldom proved a source of major financial contagion. Second, the country demonstrated a strong long-term commitment to the rigours of the Gold Standard, reinforcing the risk-free nature of government paper and the currency. Third, 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, making crucial bargains and trade-offs with the banks a great deal easier. 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 the popular pressures of emerging political open access 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 (Gilbert, 1999: 27). 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 United States as well as the UK. A range of 'rubbish' coins and notes circulated in the territory (Gilbert, 1999: 28). 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 (British appointed) governors-general of the colony. In the Atlantic provinces (most specifically New Brunswick), similar moves were under discussion.

By the promulgation in 1854 of the 1853 Currency Act in the Province of Canada, '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, thus keeping London happy. The 1853 Act also initiated a Gold Standard regime backed by government securities and gold reserves that provided for a greater degree of stability (Helleiner, 1999: 313). 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 (Powell, 2005: 26), with predictable public reactions. 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 (Gilbert, 1999: 31). 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 both the government and the banks issued notes. Private banknotes were steadily rescinded over time, starting with the larger denominations (Gilbert, 1999: 32). The Bank Act also meant that all banks steadily came under a federal charter, regulation and bankruptcy procedures (Powell, 2005: 27–8). The banking system began a process of steady consolidation across the new country as the frontier massively expanded west- and northwards. The management of 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 fiscal agent (Norman et al., 2011: 19; Perry, 1898/2012). 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 nineteenth century took the lead in providing a well-organised and national system of 10 clearing and settlement system houses (Norman et al., 2011: 11–12, 19). 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, which came along with a growing democratisation of the new nation. 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 (Powell, 2005: 37–39). 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 new Office of the Inspector General of Banks (deposit insurance would have to wait until 1967). By 1926 Canada was back on the Gold Standard.

However, the pressure of war, debt, economic development and eventually depression increased the need to co-ordinate 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 (Powell, 2005: 48). 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 (especially politically sensitive in a Quebec undergoing an independence crisis) and an acceleration of cross-border (continental and global) 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 cartelised regulatory environment that provided ample liquidity and encouraged conservative risk management (Arjani & Paulin, 2013). A market conduct authority, the Financial Consumer Agency (FCAC) was added in 2018.

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. It was further facilitated by the early emergence of a cartelised financial sector and federal powers that made the necessary trade-offs possible.

The experience of war, depression and minor bank failures combined with enhanced democratic responsiveness of the government 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 in 2007–09. Canada arguably fulfils the OFA criteria as well as any national financial system today and better than the other two cases examined here.

4 | 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 even 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 (including regional) level will have to stumble towards the fulfilment of the OFA criteria as well—because stabilising global financial market integration is a policy imperative for democratically accountable governments. Some of that 'stumbling' has already occurred.

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 industrialised economies into developing countries during periods of relative stability only to surge back out again once international market participants lose confidence in developing markets (Calvo, 1998). 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 liberalisation or, where capital markets were already open, to complement liberalised capital markets 'with iron clad rules that make the country resemble a region of a stable country (Argentina's Currency Board experience was a good example)' (Calvo, 1998: 48).

Unfortunately, the 1998–2002 crises in Argentina revealed that purely domestic institutions are not enough. Indeed, it is likely that the effective dollarization of the Argentine economy via the currency board 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' (Calvo et al., 2003: 6). The travails of the Eurozone remind us that the problem is not limited to developing countries. 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 deep cross-border market integration. The closer that 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 establishing the institutional arrangements implied by the criteria for optimum financial areas is a major co-ordination problem as well as being 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 stabilisation 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 instability than compromise on a shared institutional and policy framework. Yet, our analysis reveals that any progress towards 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 centralised counterparties become nodal points for systemic risk. The tension that emerged in 2014 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.

TABLE 3 Clusters of European financial market innovations (proposed or enacted) during the crisis.

Policy innovation	Objective	Status
Make market infrastructure more resilient		
Collateral rules (risk-free asset)	Balance need for access to collateral with quality concerns for lenders, including CSDs and central banks so that participants in different countries (and hence different collateral holdings) have roughly equal access to liquidity.	Mixed tight/loose with exceptions.
Debt mutualization (risk-free asset and debt management)	Mutualize part of national sovereign debt to create a common risk-free asset so that financial market participants in different countries do not have to move their capital across national jurisdictions to make it safe.	Not happened.
Clearing, settlement, depository (centralised counterparties)	Shift transactions from over the counter to central counterparties so that financial market participants in different countries can avoid counter-party-specific geographic risk.	Expanded to most derivative contracts.
Target2 & Target2 for Securities (centralised counterparties)	Use central bank money to facilitate cross-border transactions and to wean borrowers off dependence on banks in order to weaken the bank sovereign nexus and to make cross-border investment as easy as investment within countries.	Expanded to securities markets (and multiple currencies).
Strengthen confidence among market participants		
Single Supervisory Mechanism and Single Resolution Framework (supervision and resolution)	Create a common mechanism for supervising and enforcing compliance with banking regulations in order to enhance the transparency and equivalence of banking conditions across regulatory jurisdictions.	Created with emphasis on risk-reduction and bail-in and possibilities for national regulators to raise local requirements.
European stability mechanism and predecessors (supervision and LoLR)	Create a common resource to finance sovereigns without market access in order lower the risk of disorderly sovereign default.	Limited in size and with conditions.
Securities Markets Program, Outright Monetary Transactions, Asset Purchase Program and CCP location policy (LoLR)	Use central bank transactions to stabilise securities markets and underwrite CCPs in order to stabilise the value of collateralizable assets and to strengthen confidence in central counterparties.	Controversial (SMP, APP), never used (OMT), and rejected by courts (CCP location policy).
Single Resolution Fund and European Deposit Insurance Scheme (predictable resolution)	Provide financial resources to resolve cross-border banks and ensure small deposits in order to weak the bank-sovereign nexus and to increase confidence in national banking systems.	Primary reliance on national resources with some possibility for ESM backstop.

Note: The purpose of this table is to cluster the financial market issues raised at the European level. The list of issues is adapted (and expanded) from the 'financial union' part of the Five President's report (Juncker et al., 2015: 11–12). The more technical issues are analysed in greater detail in Schelkle (2017). The confidence building measures are analysed in the work of Howarth and Quaglia (2013, 2014, 2016) and Gocaj and Meunier (2013).

The debates over prudential oversight, lender of last resort provision and bank (and sovereign) resolution mechanisms are more obvious illustrations of the political economy obstacles because the distributive implications are more self-evident. Governments do not wish to surrender their close relations with home financial institutions; nor do they 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 makes them no more willing to surrender these privileges once the immediate threat of crisis dissipates.

Here the ongoing European debate on banking union is instructive. Most importantly, Eurozone countries have yet to accept the outcome of the Eurozone crisis 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 (see Table 3). Many of the reforms initiated during the crisis 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.

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There is no personal, professional, financial-institutional or other conflict of interest to be reported with respect to this article.

DATA AVAILABILITY STATEMENT

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