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Systemic risk, macro-prudential regulation and organizational diversity in banking

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Abstract

Since the 2007–2008 global banking crisis, systemic risk has become the central target of policy design in banking regulation in many countries. At the same time, a growing attention has been paid to the systemic importance of bank heterogeneity. The need for diversity has even found its way into official policy documents, both at the European and national level. However, most of the new thinking on the regulatory reforms targeting systemic risk has been conducted within the framework of macro-prudential regulation, which may not be adequate to deal with diversity-related causes of systemic risk. This paper aims, therefore, at contributing to the growing literature on the relationship between systemic risk and banking regulation by (i) explicating the links between systemic risk and banking diversity; (ii) discussing the adequacy of macro and micro-prudential policy instruments to address diversity-related causes of systemic risk in banking; and (iii) laying out a basic framework for diversity-enhancing policies.

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1. Introduction

Since the 2007–2008 global banking crisis, much effort has been dedicated to the understanding of excessive risk in the financial system, and to the identification of those policies that do reduce such risk or may reduce it in the future. A rich public discussion, involving academics, regulators and policy-makers, has ensued – making policy design a very relevant and lively issue for financial regulation, as Bakir and Woo point out in their introduction to this Special Issue (Bakir & Woo, 2017). At the national and international levels there has been both an intense “deliberate and conscious attempt to define policy goals” and work towards connecting these goals to “instruments or tools expected to realise those objectives”, as Howlett et al. define policy design (Howlett, Mukherjee, & Woo, 2015, p. 291). One such policy goal is that of taming systemic risk – which is, usually, broadly defined as the risk of multiple defaults of financial institutions, which have a significant negative impact on the economy as a whole.

Systemic risk is the area where the highest “regulatory pressure” has been felt in the financial industry in the aftermath of the crisis. After the initial response to the crisis, several areas for policy reform have been already identified and acted upon (satisfactorily or not) by governments. They include: addressing the moral hazard problem created by the existence of large financial firms (the so-called “too big to fail” problem) by encouraging banks to de-diversify and reduce their

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size; solving the contagion risk posed by the joint pursuit of investment banking and retail banking activities by mandating the separation of such activities (“ring-fencing”); reducing banks’ individual exposure to risk and fragility by tightening capital and liquidity requirements (especially for large and “systemically important” banks).

For each of these areas or issues, academic and policy discussions have produced an impressive array of instruments that together compose an “integrative policy mix”, “where multiple instruments and multiple governments and objectives are arranged together in complex portfolios of policy goals and means [...], often with a multi-level governance component” (Howlett et al., 2015, p. 297). In financial regulation, the multi-level governance component is obvious, spanning national, European and international regulatory settings.

Systemic risk in finance and banking has thus spawned a new complex of policy goals and instruments that carry a “transformatory potential”, according to Baker; macroprudential regulation “could signal a reversal of the primary regulatory trajectory in the financial sector over the last three decades, of allowing market actors more freedoms to price their own risk.” (Baker, 2013a, p. 418).

However, some evidence seems to suggest otherwise. Initial roadmaps for renewed financial regulation (such as the 2010 Dodd–Frank Act in the United States) have been considerably watered down. As Williams and Conley observe in the North-American context, “the basic regulatory framework – of bank debtor guarantees and regulatory bank capital and liquidity minima (that is, of risk subsidies and compensatory risk taxes) – has been maintained with tweaked parameters” (Williams & Conley, 2014). The very macroprudential reforms at the heart of the “Basel III” agreement similarly represent no departure from the pre-crisis dominant “market-based” approach (Underhill, 2015).

In addition, one key factor of systemic risk in the banking industry has not been yet the object of an adequate policy response. The lack of diversity in banking (by which we mean the lack of heterogeneous organizational forms and business models in national banking systems) has been acknowledged as a critical regulatory issue by policy-makers at national (HM Treasury, 2010) and EU level alike. This new awareness builds on a growing literature on banking diversity and its impact on risk. Yet the only proposed policy measure to stimulate banking diversity, advocated in the documents mentioned above, is the lowering of barriers at entry, while the latter was precisely one of the key pillars of the 1990s wave of regulatory reforms that led to a decline in diversity in the first place. In particular, reforms that liberalized the banking market and led to the elimination or reduction of diversity through the privatization of public banks and the de-mutualization of cooperative banks reduced both the number and the importance of alternative organizational forms within national banking systems.

The inadequacy of current “policy mixes” with regard to diversity-related causes of systemic risk is not very surprising. Not only are policy ideas, in the area of financial regulation, path dependent, as Underhill points out – and prudential regulation certainly conforms to Underhill’s view of it as a “peculiar policy paradigm [that] became embedded in a transnational policy community” (Underhill, 2015, p. 463). Policy instruments – or, rather, “instrument logics”, as Howlett and Cashore call them (Howlett & Cashore, 2009), are, as well, deeply entrenched. Contrary to the view proposed, for instance, by Baker (“we have now entered a phase of first and second order policy experimentation in the development of macroprudential policy”: Baker, 2013a, p. 419), there might be instrumental roadblocks to paradigmatic change in financial regulation. Indeed, the inadequacy of macroprudential regulation to deal with diversity-related causes of systemic risk reveal the key role of policy instruments in shaping policy outcomes (Howlett & Lejano, 2013) and the importance of taking into consideration “instrumental orientation” of policy design (Howlett et al., 2015).

Thus the present study aims at contributing to the growing literature on the relationship between regulation, banking diversity and risk by: (i) establishing a theoretically sound understanding of diversity in banking, and its relationship to systemic risk; (ii) assessing the effectiveness of existing regulatory policies in tackling diversity-related sources of systemic risk – paying particular attention to the limitations inherent to the peculiar choice of instruments associated with macroprudential policy; (iii) delineating some basic proposals for better policy design in financial regulation, in particular with regard to establishing, increasing or maintaining diversity in banking – in light with the spirit of this Special Issue, as emphasized in Section 1 (Bakir & Woo, 2017).

2. Systemic risk and biodiversity in banking systems

2.1. Systemic risk: dimensions and sources

Systemic risk is usually defined in opposition to or by contrast with individual risk, i.e. the risk of individual financial institutions failing (defaulting on their liabilities). The distinction lies in the aggregate nature of systemic

risk, i.e. a risk that manifests itself at the level of the financial system as a whole. Potential individual default events constitute systemic risk to the extent that the defaulting institutions are either so large (or “systemically important”, as they are now called) or so numerous as to disrupt the functioning of the whole financial system.

Systemic risk can thus be understood as a specific kind of market failure in the financial system. However, this specific kind of market failure can occur under a variety of forms, listed by [Allen and Carletti \(2013\)](#) as: banking panics, banking crises due to asset price falls, contagion, foreign exchange mismatches in the banking system. To that list one may add systemic liquidity crises since, as [Van den End and Tabbæ](#) convincingly argue, one key collective problem in banking during the 2007–2008 crisis was liquidity hoarding on the part of cash- or funding-constrained banks – thus transforming individual funding problems into systemic liquidity risk ([Van den End & Tabbæ, 2012](#)). Beyond this variety of forms, there is a broad agreement in the literature to distinguish two dimensions in systemic risk: the time-series dimension and the cross-section dimension (see, in particular, [Blundell-Wignall & Roulet, 2014](#); [Brunnermeier, Crockett, Goodhart, Persaud, & Shin, 2009](#); [Clement, 2010](#)).

The time-series dimension of systemic risk has to do with pro-cyclicality, which consists in excessive growth in assets (and risk) in the “up” phase of the economic cycle, combined with a thinning down of the capital base of financial institutions. So when a financial crisis hits, financial institutions are collectively over-exposed to risk.

The cross-sectional dimension of systemic risk is often reduced to what is called “inter-connectedness” (see, for instance, [Blundell-Wignall & Roulet, 2014](#)): financial institutions are so much connected to each other, that when an individual institution fails, this individual failure will quickly contaminate other institutions through a variety of mechanisms: counterparty risk, asset fire sales, liquidity crisis, etc.

However, for a deeper understanding of the cross-sectional dimension of systemic risk, one needs to separate contagion risks, inherent to inter-connectedness and which may explain the dynamics of a systemic crisis, from asset commonalities, which constitute another cause of systemic risk. The distinction is made, for instance, by [Acharya \(2009\)](#), who models systemic risk by focusing on the degree of asset correlation among financial institutions, and differentiates such correlation from systemic risk arising out of inter-bank contracts. [Allen et al.](#) somehow qualify this argument by showing that asset commonality only creates systemic risk to the extent that it interacts with debt maturity: they argue, indeed, that banks are “informationally linked” through short-term debt contracts ([Allen, Carletti, & Babus, 2013](#)). Further studies by [Acharya and Yorulmazer \(2007\)](#) and [Wagner \(2008, 2010\)](#), discussed below, focus on asset commonalities to explore the tradeoff between individual and systemic risk generated by asset diversification among financial institutions.

A final element of cross-section systemic risk consists in the size distribution of individual risk within the financial system. This is the problem of systemically important financial institutions, often discussed in the academic and policy literature since the outbreak of the 2007–2008 crisis. [Table 1](#) summarizes these various dimensions of systemic risk in financial systems.

2.2. Lack of banking diversity as a source of systemic risk

Since the 2007–2008 global banking crisis, the lack of diversity in banking has been identified as a serious source of systemic risk worth specific regulatory attention. “The need to maintain diversity in the financial services sector” is cited as a potential policy objective for the new Consumer Protection and Market Authority in a 2010 Treasury White

Table 1
 Dimensions and sources of systemic risk.

Dimensions of systemic risk	Sources of systemic risk	Brief description
Time series	Pro-cyclicality	In boom times, financial institutions all grow their balance sheet faster than their capital base
Cross-section	Inter-connectedness	Financial institutions are inter-connected through money markets & payment systems; this makes contagion worse when crisis hits one (well-connected) institution
	Commonality of assets	Financial institutions are exposed to the same asset or asset classes; brutal or large swings in asset prices thus affect multiple financial institutions simultaneously
	Systemically important institutions	Too big to fail: risk is skewed towards large financial institutions which raise a moral hazard problem for regulators

Paper in the United Kingdom (HM Treasury, 2010, p. 32); At the European Union level, a whole chapter of a 2012 report by a High-level expert group on reforming the structure of the EU banking sector (the “Liikanen report”) is dedicated to the various aspects of diversity in banking.

While banking diversity is slowly gaining traction in policy circles, it is also the object of a small but growing academic literature. Cross-sectional heterogeneity has been a concern for scholars of bank efficiency for some time (see, for instance, Berger & Humphrey, 1997); and more recently, pre-crisis works on systemic fragility in banking started shedding light on the relationship between banking homogeneity and systemic risk (see Acharya & Yorulmazer, 2007; Wagner, 2008). But more specific and detailed attention to banking diversity has been paid in the context of post-crisis theoretical developments that propose an ecological approach to systemic risk, promising therefore further advances in our understanding of banking diversity – its nature and its consequences.

The emerging literature on banking diversity develops three types of arguments. The first argument simply consists in acknowledging the existing diversity of banking business models across and within national banking systems, and the fact that these different business models are not equally performing in terms of efficiency, profitability and risk. Such an argument can be found in the official government reports cited above. It is also the object of a comprehensive, comparative study of European banks, with a specific focus on cooperative and savings banks (Ayadi, Schmidt, & Carbó Valverde, 2009; Ayadi, Llewellyn, Schmidt, Arbak, & De Groen, 2010).

The second argument, developed, in part, by Michie (2011), is that diversity is good for the functioning of the (banking) system in evolutionary terms – in other words, as Michie puts it: “In a situation of uncertainty and unpredictability, we cannot know which model will prove to be superior in all possible future circumstances, so we ought to be rather cautious before destroying any successful model” (Michie, 2011).

The third argument is the one that is most relevant for our argument here: diversity is valuable as a guarantee of a stable financial system. In other words, a banking system composed of heterogeneous organizations does better at mitigating systemic risk than a homogeneous banking system, whatever the source of heterogeneity. This point is very similar to the view that homogeneous banking systems suffer from a “too many to fail” problem, whereby an implicit guarantee by regulators “induces banks to herd ex-ante in order to increase the likelihood of being bailed out” ex post (Acharya & Yorulmazer, 2007). More broadly, diversity in the banking system arguably helps decrease systemic risk by decreasing the degree of similarity in banks’ portfolios. Indeed, the 2007–2008 crisis was not caused by the fact that all banks specialized in the same asset class (say, mortgage assets) – rather, it was caused by the high level of correlation between banks’ diversification strategies. As Andrew Haldane pointed out in a famous 2009 speech, individual diversification by banks might lead to a decrease of systemic diversity – and, simultaneously, an increase in systemic risk (Haldane, 2009; see also Michie, 2011). This argument lies at the core of the diversity literature, since it goes beyond the specific identity or type of organizational forms to plead for a more general form of diversity.

But what are the mechanisms that relate (the lack of) banking diversity or heterogeneity, on the one hand, and systemic risk on the other? This question is addressed by a small stream of studies, which treat bank heterogeneity as the degree of asset or income diversification exhibited by various banks. This is certainly a good starting point for understanding banking diversity, given the fact that the degree of asset diversification can be associated with different business models, themselves tied to different bank characteristics (size, governance, ownership, etc.). There are two potential sources of systemic risk from this perspective.

The first one clearly relates to asset commonality. In a 2007 theoretical paper, Acharya and Yorulmazer showed how bank regulators’ potentially conflicting objectives (especially the conflict between a central bank’s crisis prevention role and its crisis-management role) create a “too many to fail” guarantee that “induces banks to herd ex-ante in order to increase the likelihood of being bailed out” (Acharya & Yorulmazer, 2007, p. 2). Banks herd by mimicking each other’s diversification strategies, thus giving rise to a high degree of asset correlation, which constitutes systemic risk.

Wagner (2008, 2010) considers the relationship between bank heterogeneity and systemic risk from another point of view. The problem, Wagner argues, is not diversification per se: diversification does, indeed, decrease banks’ exposure to idiosyncratic risk (i.e. it makes individual banks safer). This implies that less liquidity has to be redistributed in the case of crisis. However, diversification also leads banks to re-optimize their portfolio, inducing them to decrease their liquidity holdings. This, in turn, increases the likelihood of liquidity crises, i.e. systemic risk (Wagner, 2008). Thus asset correlation, according to Wagner, is not problematic: it is linked to diversification, which is “socially desirable” since it decreases individual banks’ risk. What is problematic is that banks hold a “socially inefficient combination of projects and liquidity” (Wagner, 2008, p. 332). In a subsequent study, significantly published after the 2007–2008 global banking crisis, Wagner seems much less sanguine about diversification, arguing

that it has unambiguously negative effects on systemic stability (Wagner, 2010). This second mechanism (which we will call here “systemic liquidity shortage”) is rarely addressed upfront in the theoretical literature about systemic risk. Rather, it is usually treated as an instance of pro-cyclicality – i.e. the build-up of systemic liquidity shortage is seen as a time-dependent characteristic related to balance sheet growth. This second argument or mechanism helps us better identify the strong connections or feedback loops between the various sources of systemic risk. Such connection is highlighted by Allen et al., who identify as an important source of systemic risk the interaction between asset commonality and debt maturity (Allen et al., 2013). This connection appears more clearly (but not exclusively) in relation to banking diversity.

The new concern about the relationship between bank heterogeneity and systemic risk/stability has spurred new work on the ecological dynamics of banking. However, by contrast with the two mechanisms identified above, most of these works focus on inter-connectedness between financial institutions (Beale et al., 2011). This is the case, for instance, of May et al. who, building on research bringing together financial economists and engineering and ecological scholars, emphasize the need for “dissortative networks” and “modularity” (May, Levin, & Sugihara, 2008, p. 894). Table 2 summarizes diversity-related sources of systemic risk identified in the literature.

As appears here, most of the sources of systemic risk identified in the literature can be related to a lack of diversity in banking. The fourth source of systemic risk, i.e. risk skewness caused by the existence of systemically important financial institutions (SIFIs), is superficially associated with an excess, not a deficit, of diversity: the existence of large institutions that concentrate most of the risks in the system, by contrast with a range of smaller institutions that are much less risky. This is why in Table 2 this particular source of systemic risk is not associated with a diversity-related cause of systemic risk. However, when analyzing SIFIs dynamically, in the concrete evolution of (national) financial systems, it becomes clear that the emergence of large banking holding companies results from an exhaustion or a reduction in the diversity of business forms in the banking system.

Most of these arguments have implications for banking regulation. As several authors argue, the relationship between bank heterogeneity and systemic risk present policy-makers with a tradeoff between competition and stability (Acharya, 2009; Allen & Carletti, 2013). In addition, whatever effects asset or income diversification has on individual bank performance and stability (see, for instance, De Young & Roland, 2001), its systemic effects are problematic, too.

However, the relationship between systemic risk and bank diversity is still too little known; this lack of understanding raises additional problems for scholars and policy-makers. First, what are the most appropriate regulatory instruments that are being used or that may be used to dry up diversity-related sources of systemic risk? And secondly, how do we measure and identify banking diversity, or as the growing body of financial ecological works calls it, biodiversity in banking? The first question will be addressed in the next section. The second question is addressed below.

2.3. What exactly is biodiversity in banking?

Once acknowledged as an important issue for its effects on systemic risk, banking diversity, however, still remains very much an enigma. There is no widely shared or accepted definition of bank diversity: does diversity consist in the existence of a variety of bank ownership types, bank sizes, business models? The small, nascent literature on the

Table 2
 systemic risk and bank diversity.

Dimensions of systemic risk	Sources of systemic risk	Diversity-related causes
Time series	Pro-cyclicality	Heterogenous institutions might be individually as pro-cyclical as homogeneous ones, but will likely be less pro-cyclical collectively
Cross-section	Inter-connectedness	Both higher informational and funding inter-connectedness characterize financial institutions with similar business models
	Commonality of assets	By definition, homogenous financial institutions are exposed to similar assets/asset classes
	Systemically important institutions	No direct cause

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ecology of financial systems remains very vague and general as to the specific dimensions and levels (species, individuals) at which biodiversity should be assessed.

By contrast, the recent literature on the relationship between banking heterogeneity and systemic risk, discussed above, mostly focuses on differences in banks' observed behavior, overlooking banks' structural characteristics (Acharya & Yorulmazer, 2007; Wagner, 2008); and treating heterogeneity as a mono-dimensional phenomenon.

But banking diversity is, certainly, multi-dimensional: banks differ in terms of ownership, governance and size, and these differences have to do with distinctive business models and, therefore, behavior as well. Bank-level characteristics such as size and geographical scope are not strong enough guarantees of the maintenance of diversity over time – in other words, small banks can become big fast and local banks can broaden their scope, therefore getting closer to the large banking group held as a (negative) benchmark in the literature on diversity. Similarly, bank ownership and governance and banks' charter, while they may constrain the ability of certain types of individual banks (for instance, mutual banks) to diversify or, more broadly, to align their business models to other banking types (for instance, joint-stock banks), do not prohibit homogenization to take place as a trend – in addition, regulatory reforms in advanced industrial countries over the past thirty years have made it easier for any type of banks to diversify and enter any segment of the credit or savings market. In other words, heterogeneity of bank behavior might result from a combination of characteristics which exhibit causal relations among themselves.

A broader, multi-dimensional understanding of bank diversity is therefore required. This is what Michie and Oughton undertake to do in a recent study (Michie & Oughton, 2013), proposing a composite index of banking diversity, including (i) ownership and corporate diversity; (ii) competition; (iii) balance sheet/funding model diversity; (iv) geographic concentration. The present paper builds on these insights. Despite the flaws and gaps in the emerging but limited literature on banking diversity, one may thus advance the following few claims about banking diversity that may be helpful to adapt banking regulation.

First, banking diversity can be broadly defined as the co-existence of a plurality of business forms within a given banking system. These business forms can be understood as bundles of characteristics pertaining to (i) banks' ownership, legal status and governance system; (ii) banks' size; (iii) banks' observable behavior in terms of (a) the degree of asset and income diversification (or specialization) and (b) the structure of liabilities.

Secondly, the degree of banking diversity can be assessed as the combination between (i) measures of banking market structure (especially, the degrees of competition and concentration within the banking system); and (ii) the effective distribution of banking assets and liabilities across diverse business forms.

Third, there is no one model of banking diversity, valid across time and countries, especially with regard to systemic risk. In other words, banking diversity based on the multiplicity of small cooperative banks collectively holding a sizeable share of banking deposits and loans to significant segments of the economy (roughly, the German model) may have the same effects on systemic diversity as banking diversity based on the existence of a few large cooperative banking groups competing with for-profit banking groups for funds and investment opportunities (the French model). This, obviously, requires a flexible regulatory approach, a requirement that compounds the complexity of banking diversity in the first place.

The next section precisely looks at and discusses the regulatory implications of the previous discussions of banking diversity, in light with the present regulatory concerns with systemic risk.

3. The regulatory responses to systemic risk with regard to banking diversity

3.1. The macro-prudential main road to deal with systemic risk

Despite a growing awareness of problems posed to financial stability by a lack of diversity in banking, regulators and scholars have not come up with corresponding specific regulatory ideas. In the Vickers report in the United Kingdom, the only instrument mentioned to deal with the lack of diversity was the lowering of barriers at entry – which was, arguably a source of *reduction* in banking diversity in the United Kingdom in the 1980s and 1990s! Tellingly, in the only existing survey of cross-country data on bank regulation (the World Bank's Banking Supervision Survey of which, as of February 2016, four iterations have been conducted), none of the 270 survey questions (in the latest, 2011 iteration) refers to banking diversity. There is even an “anti-diversity” bias in the questions asked since they often refer specifically to “commercial banking” (for instance in questions 1.4, 1.7, etc.). Cooperative banks are never

mentioned in the survey, while savings banks are mentioned only *en passant* (in Question 13.1.1, which refers, in the side annotation, to “small savings banks and credit unions”).

The main road to address systemic risk has been, since the 2007–2008 global financial crisis, that of macro-prudential regulation, which has become the alternative solution to the inadequate reliance on micro-prudential regulation (Clement, 2010) and on “unhelpful mainstream macroeconomic models” (Arnold, Borio, Ellis, & Moshirian, 2012). Originally a “missing pillar” of financial regulation (Davis & Karim, 2009), macro-prudential regulation has taken up a key role in the strategy publicly adopted by central banks across countries in recent years.

In a recent article, Hanson et al. defined macro-prudential regulation as “an effort to control the social costs associated with excessive balance sheet shrinkage on the part of multiple financial institutions hit with a common shock.” (Hanson, Kashyap, & Stein, 2011, p. 5; see also Brunnermeier et al., 2009) Macro-prudential regulation has thus been conceptualized, in the post-crisis context, as an adequate response to the collective failure of traditional micro-prudential regulation to address externalities seen as the main causes of systemic risk (De Nicolò, Favara, & Ratnovski, 2012; World Bank, 2012).

The distinction between macro-prudential and micro-prudential regulation was clearly articulated, years before the 2007–2008 crisis, by a senior BIS official: “The distinction between the micro- and macro-prudential dimensions of financial stability is best drawn in terms of the **objective** of the tasks and the **conception** of the mechanisms influencing economic outcomes. It has less to do with the **instruments** used in the pursuit of those objectives.” (Crockett, 2000, Emphasis in the original). Eleven years later, a US regulator, the Financial Stability Board, put it clearly: macro-prudential regulation “uses prudential tools to limit systemic or system-wide financial risk” (Blundell-Wignall & Roulet, 2014).

Thus macro-prudential regulation could be (and has been) constructed, over time, as the recalibration of micro-prudential tools to deal with individual financial institutions’ contribution to systemic risk (by contrast with micro-prudential regulation’s focus on individual bank risk). For instance, capital requirements could be transformed from a micro-prudential to a macro-prudential instrument by reallocating banks’ capital on the basis of an evaluation of each banks’ contribution to overall risk (Gauthier, Lehar, & Souissi, 2012).

An intense scholarly and policy activity has been dedicated, since the 2007–2008 crisis, to the identification of macro-prudential instruments and the (preliminary) assessment of their effectiveness. Table 3 lists the most often cited instruments, classified by objectives.

Comparing Table 3 with Table 1, one notices that a disproportionate part of macro-prudential regulatory effort has been geared towards addressing the pro-cyclical dimension of systemic risk. The problem of asset commonality, although identified by several authors as an important source of systemic risk, is not addressed by macro-prudential policies. As per systemically important financial institutions and inter-connectedness, important tools of regulation (ring-fencing or the Volcker rule) are specifically not of a macro-prudential nature (and will be discussed below).

Table 3
 Macro-prudential regulatory tools and objectives.

Dimensions of systemic risk	Macro-prudential intermediary objectives	Macro-prudential regulatory tools
Time series	Limit pro-cyclicality through capital	Counter-cyclical capital requirements/buffers, time-varying/dynamic provisioning, stress tests
	Limit asset growth	Caps on the loan-to value ratio, caps on the debt-to-income ratio, ceilings on credit or credit growth
Cross-section	Reduce scope for liquidity crisis	Limits on net open currency positions/currency mismatch (NOP), limits on maturity mismatch and reserve requirements
	Limit exposure to volatile capital flows	Limits on net open currency positions/currency mismatch
	Limit skewness of risk distribution (SIFIs)	Capital surcharges on SIFIs, institution-specific limits on (bilateral) financial exposures

Source: Lim et al. (2011), Claessens, Ghosh, and Mihet (2014), and author.

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3.2. Limitations of macro-prudential instruments in relation to banking diversity

There are several problems associated with macro-prudential regulation, as pointed out by Underhill, for instance (Underhill, 2015). In particular, contrary to more optimistic assessments (for example, Baker, 2013a,b), Underhill shows how in practice, the new rules devised within the Basel Committee for Banking Supervision within a macro-prudential framework confirm rather than displace the “market-based” logic inherent to pre-crisis prudential regulation. Similar limitations may be identified with regard to diversity-enhancing causes of systemic risk.

More specifically, the current regulatory focus of (most) regulatory authorities suffers from (a) the inadequacy of macro-prudential policy to address diversity-related sources of systemic risk; (b) the under-development of alternative (complementary) policy tools specifically targeting diversity-related sources of systemic risk.

The first limitation pertains both to macro-prudential regulation in particular and to prudential regulation in general. Macro-prudential regulation ignores diversity-related causes of systemic risk for two reasons. First, macro-prudential tools are tailored to the whole population of banks (or financial institutions in general), regardless of the variety of business models and forms within the banking system. This approach derives both from the prudential nature of the tools (which were, as argued above, “re-calibrated” from micro-prudential tools) and from the behavioral assumptions underlying macro-prudential regulation. Two quotes, by influential studies in the macro-prudential literature, illustrate such assumptions: “In the up-phase of an economic cycle, price-based measures of asset values rise, volatility-based measures of risk fall, and competition to grow bank profits increases. Most financial institutions spontaneously respond by (i) expanding their balance sheets; (ii) trying to lower the cost of funding by using short-term funding from the money markets; and (iii) increasing leverage” (Brunnermeier et al., 2009, p. xvi); “a model based on fire sales and credit crunches suggest that financial institutions have overly strong incentives 1) to shrink assets rather than recapitalize once a crisis is under way and 2) to operate with too thin capital buffers before a crisis occurs, thereby raising the probability of an eventual crisis and system-wide balance-sheet contraction” (Hanson et al., 2011, p. 7).

In both cases, “financial institutions” (“most financial institutions”, Brunnermeier specifies, somewhat more cautiously) are supposed to behave in a similar way and respond to similar sets of incentives. But the empirical evidence available on the actual behavior of financial institutions, within national banking systems, points to very *different* attitudes towards asset/credit growth and risk among financial institutions with different business models: small and large savings and cooperative banks, public or state-owned banks often differ from for-profit, commercial banks in terms of asset or income diversification and the structure of their balance sheet (see Butzbach & von Mettenheim, 2014, for a review). Such differences have an impact on the comparative performance of different types of banks. In particular, recent empirical studies have shown how, overall, “alternative banks” (cooperative banks, savings banks and public banks) (i) have a higher earnings stability over time with respect to commercial banks, measured inter alia by the z-score (Ayadi et al., 2009, 2010; Beck, De Jonghe, & Schepens, 2012; Garcia-Marco & Robles-Fernandez, 2008); (ii) are less likely to default (Beck et al., 2012; Salas & Saurina, 2002); and (iii) have a lower proportion of non-performing loans in their loan portfolio than commercial banks (Beck et al., 2012; Garcia-Marco & Robles-Fernandez, 2008). These differences, in turn, are likely to have an impact on financial institutions’ contribution to systemic risk. For example, cooperative and savings banks are likely to be much less pro-cyclical than their for-profit, joint-stock competitors (Schclarek, 2014).

The second reason for the lack of interest in diversity within macro-prudential regulatory tools or objectives, which is more problematic for an approach explicitly aimed at addressing the causes of systemic risk, is the ignorance of the effects the *structure* of the banking system has on systemic stability. By “structure” we mean, here, the distribution of business models within the system. In other words, according to the literature briefly surveyed in Section 2, the degree of homogeneity or heterogeneity in the banking system matters for financial stability – but it is largely overlooked by macro-prudential regulation. Yet this structure is hugely important. In their study of the Spanish banking system, Carbó Valverde et al. show that the presence of savings banks decreases overall risk in banking systems (Carbó Valverde, Kane, & Rodriguez, 2008). Similarly, Schclarek notes that “the importance of the [counter-cyclical] role of public banks is dependent on the size of this sector relative to the whole financial system.” (Schclarek, 2014, p. 50).

Why, then, ignore the structural effects of diversity on systemic risk? First, because prudential regulation is geared towards the production of incentives towards individual bank behavior. As the World Bank Global Financial Development Report for 2013 (which aims to “re-think the role of the state in finance”) puts it, the key challenge for regulators is to provide bank managers the right incentives to behave well (World Bank, 2012, p. 47). Secondly,

because of a steadfast commitment to competition in policy circles, even in presence of evidence of tradeoffs between competition and stability (see, for instance, [Acharya, 2009](#)). The 2012 World Bank report cited above explicitly stated that state policies should not restrict competition: “The state should promote competition both as a regulator and as an enabler of a market-friendly informational and institutional environment.” ([World Bank, 2012](#), p. 83).

Of course, beyond the internal limitations of prudential regulation, a vast array of factors might explain why the post-2008 crisis environment has not been conducive to a significant upheaval of banking regulation (such that diversity concerns might have been addressed). A political economy approach to banking regulation may thus show how, beyond mere regulatory capture, private sector interests have been able to influence policy and regulation in complex ways, ensuring the toning down of the most far-reaching regulatory changes ([Young, 2012](#)); and how information asymmetries within international regulatory fields favored large international banks ([Lall, 2012](#)).¹ In addition, policy issues have been framed in a way that is more compatible with ongoing concerns of regulators that lack any significant bite on the fundamental causes of the crisis ([Froud, Tischer, & Williams, 2016](#)).

The second limitation of current trends in regulatory efforts aimed at reducing systemic risk is the lack of alternative or complementary instruments targeting banking diversity, beyond macro-prudential regulation. Of course, the literature on regulation and systemic risk does mention the existence of (and the need for) non macro-prudential instruments to abate systemic risk ([Borio, 2010](#); [Lim et al., 2011](#)). Two policy areas are often mentioned: monetary policy and fiscal policy. However, monetary and fiscal policy instruments are directed at either the financial system as a whole or segments of it (for instance, the mortgage market), to avoid the formation of asset price bubbles.

The only aspect of banking diversity that is explicitly contemplated and discussed in the literature on systemic risk and regulation is size, i.e. small versus large banks. As mentioned above, given the importance of the skewness of risk distribution as a dimension of systemic risk, part of macro-prudential regulation is directed at curbing such distribution, especially through a range of instruments weighing disproportionately on large financial institutions. However, these instruments have been conceived to discourage the excessive growth of financial institutions; they are not helpful when addressing the need to have a multiplicity of types of financial institutions within banking system.

The policy measures most relevant for bank diversity are the structural regulations targeting banks’ business models, such as the Volcker rule, the Vickers and Liikanen proposals on ring-fencing (see a recent review by [Gambacorta & van Rixtel, 2013](#)). The basic idea behind these regulations is to sever the link, or insulate, “traditional” retail banking activities from riskier activities pursued by banks on capital and money markets. The similarity with the approach advocated below is that such regulations target banks’ business models, and acknowledge the need for different business models within banking. However, the concern shared by all these policies or proposals has nothing to do with the diversity of banking systems per se – it has to do with what is often (rightly or not) seen as an excessively risky business model in banking, which these policy measures seek to curb.

Overall, neither macro-prudential regulation, nor micro-prudential regulation, nor monetary or fiscal policy, not even the structural measures mentioned above address what we identify here as diversity-related causes of systemic risk. The next and final section delineates tentative steps towards such missing diversity-enhancing policies.

4. Diversity-enhancing policies

4.1. Policy objectives and instruments

In response to the likely effects a lack of diversity in banking has on systemic risk (explored in Section 2), and given the inadequacy of current regulatory tools to deal with it (discussed in Section 3), a return to “structural” banking regulation is advocated here. In line with the simple relationships between diversity and various sources of systemic risk, summarized in [Table 1](#), the overall objective of diversity-enhancing policies should be that of ensuring sufficient diversity within banking systems so as to decrease systemic risk. This final objective can be decomposed into two intermediary objectives: (i) first, diversity-enhancing policies should enable the existence and persistence of different business models (or forms) within national banking systems; (ii) secondly, diversity-enhancing policies should guarantee a minimum degree of systemic diversity between different business models.

¹ Thanks to an anonymous reviewer for pointing that out.

These two intermediary objectives are necessary complements so that banking diversity is enhanced and systemic risk reduced within a banking system. Each objective can be associated with a number of policy instruments/regulatory tools, which mostly (but not exclusively) fall outside the domain of prudential (macro or micro) policies. The first objective can be reached through interventions in the field of corporate law (where banks' legal status falls within ordinary corporate law), ordinary bank regulation (authorization regime) and minimal capital requirements. The aim should be to make sure that banks can exist under various legal and corporate forms in the first place: joint-stock firms, public entities, cooperatives, etc. An example of diversity-enhancing reforms falling under this objective is the 1999 reform of French savings banks, which transformed the sui generis legal status of the *Caisse d'épargne* into a mutual bank. A counter-example might be the recent (2015) decision by the Italian government to facilitate the transformation of large mutual banks (*Banche Popolari*) into joint-stock banks.

As argued in Section 1, banking business models cannot be reduced to ownership structures and legal status: mutual or public banks may end up behaving essentially as their for-profit competitors, as the cases of Spanish savings banks and German public state banks remind us. As a matter of fact, the scholarly literature on business models emphasizes organizational behavior, that is, the “production, marketing, investment and other actions taken by an organization to create and capture value.” (Froud et al., 2016, p. 7). Froud et al. also mention the little attention paid by British regulators to retail banks' business models. There, however, are various regulatory tools regulators and policy-makers may use to make sure that not only a diversity of business forms, but a diversity of business models exists in banking. Tax or regulatory incentives might be used as ways to encourage savings, cooperative or public banks to remain effectively diverse from their for-profit competitors.

The second intermediary objective is more complex in nature and requires a broader array of interventions through multiple regulatory fields: corporate law, corporate taxation, reform of the regulatory framework, financial regulation, competition law. Indeed, the aim here is to ensure a minimum of *effective* diversity within the banking system. In other words, the possibility of having multiple business models within banking is not enough; neither is the effective existence of diverse types that have only a marginal impact on main banking markets. For instance, the United Kingdom counts a few dozen building societies – mutual banks with a retail specialization, prudent lending policies and reliance on retail deposits for their funding. Building societies' business model is at odds with that of the high-street joint-stock banking groups that dominate British retail lending and deposit markets; however, they occupy a very peripheral position within the British financial system, and thus cannot be seen as evidence of effective diversity in that banking system (see Butzbach, 2014).

As emphasized by Michie and Oughton (2013), competition and concentration are key causal factors behind (the lack of) banking diversity. Therefore, diversity-enhancing policies must contemplate interventions in banking market structure to decrease market concentration and reduce the diversity-reducing effects of competition. Various policy tools belonging to different regulatory fields may be mobilized. Favorable taxation of certain banking assets and liabilities might be a way to do this. For instance, in France, the most important liability and source of funding for savings banks is a special savings booklet, the *Livret A*, which benefits from a favorable tax treatment.

To reach these two objectives, policy-makers need to be aware of the multi-faceted nature of diversity and thus adopt a multi-level framework, summarized below.

4.2. A multi-level framework: challenges and implications

In line with the argument put forward above (Section 1), given the multi-level nature of banking diversity, the multiple diversity-enhancing, diversity-maintaining or diversity-reducing regulatory instruments and institutions that need to be adopted to reduce diversity-related systemic risk can be classified in five categories – each category pertaining to what we have identified above as key dimensions of banking diversity:

- i. Bank ownership, status and governance.
- ii. Regulation and taxation of assets and liabilities.
- iii. Regulation and taxation of banking operations, accounting, etc.
- iv. Regulation of banking market structure.
- v. Regulatory framework (institutions and instruments).

The last item is a fundamental component of diversity-enhancing policies. The existence of separate regulatory agencies for various bank types, or of dedicated departments with separate cultures and traditions within single bank regulators, may play a role towards the maintenance of diversity in banking. In the United Kingdom, for instance, the existence of a dedicated regulator (the Chief Registrar, and then the Building Societies Commission) for a century and a half before 2001 certainly helped maintain the cohesiveness and distinctiveness of British building societies. However, the regulatory framework must also take into consideration the role played by self-regulatory bodies, which is variable across countries. In Germany, for instance, a sectoral association, BVR, manages German cooperative banks' deposit guarantee fund and presents consolidated financial statements (since 2003) for the whole cooperative financial sector.

The multi-level approach advocated here raises two challenges: (i) first, the multiplicity of regulatory tools and fields involved; (ii) secondly, the contingency of any diversity-enhancing policy framework on country characteristics of the financial system.

As showed above, the nature of regulatory instruments involved, directly and indirectly, to establish, maintain, increase or decrease banking diversity is very heterogeneous. For instance, banking diversity might be affected by measures pertaining to the taxation of bank liabilities and by the regulation of corporate governance in general. Bank regulators might not be in charge of all the specific instruments involved (for instance, they might not be responsible for changes in company law or financial taxation) – even though it might be expected that they have sufficient knowledge of whatever regulatory aspect of relevance to banking (especially in the presence of dedicated bank regulators, as mentioned above).

The second challenge or difficulty arises from the fact that the quality and dimensions of diversity varies across countries. For instance, diversity in country A might be enhanced by the co-existence of a small group of large joint-stock banks, together with the capillary presence of many small mutual banks, which collectively hold large lending and deposit market shares; while in country B, diversity might be enhanced through the existence of a few large joint-stock and state-owned banks. Thus, any diversity-enhancing framework should be adapted to the particular configuration of a country's financial and banking system.

5. Conclusion

Diversity-enhancing policies respond to a simple argument: the argument that banking diversity matters for systemic stability and that, therefore, enhancing diversity through regulation would help reduce systemic risk in banking. As argued above, a growing literature on banking diversity (or heterogeneity) shows that the lack of diversity has a negative impact on several dimensions of systemic risk. In addition, while the crust of post-2007 crisis regulatory efforts has been within the area of macro-prudential regulation, neither macro-prudential policies nor other policy proposals or regulatory reforms deal adequately with diversity-related causes of systemic risk. A new approach, therefore, is needed.

This new approach, which we call a diversity-enhancing framework for bank regulation, is based on a multi-level understanding of banking diversity; it calls for the use of multiple regulatory and policy instruments across regulatory fields; it is tied to a revamp of the regulatory framework; it needs to be tailored to individual countries' needs and banking structures. These characteristics make the new framework a difficult challenge for banking regulation.

However, the difficulties can be overcome. As a matter of fact, the new approach presented above is not radically new. In fact, it is in part a call to come back to the old-fashioned structural approach to banking regulation – the approach that prevailed until the shift to prudential regulation in most countries in the 1980s and 1990s. As the examples used in the previous section have shown, the instruments and policies advocated here already exist, under one form or another, in many countries with a high degree of banking diversity (such as Germany). Furthermore, this new framework fully fits with more recent approaches in policy design, which advocate a move away from tools to “toolkits” (Howlett et al., 2015).

Two caveats apply to future investigations of diversity-enhancing policies. First, diversity-enhancing policies should be conceived in dynamic, not static, terms. Diversity-enhancing measures can be temporary. The fall in diversity caused by a regulatory reform (for instance, the 1986 British building societies reform) cannot be stopped or reversed by symmetrically-opposed reforms: biodiversity in banking is very much alike biodiversity in the natural world: it takes little time to destroy it but it might take ages to (re) build it. Thus diversity-enhancing policies might be adopted only after diversity-reducing policies are stopped or abandoned.

The second caveat concerns the role and place of regulation. Regulation cannot do everything: diversity-enhancing policies might support and buffer the existence and persistence of diverse business models in banking, but it may not substitute for the initiative of groups or individuals or the broader sets of incentives and institutional constraints that determine the emergence and the growth of alternative business organizations. The framework proposed here thus may incorporate insights from the kind of “critical business model analysis” advocated by Froud et al. (2016). Indeed, the latter emphasize both the importance of business models as the correct unit of analysis to (re) formulate banking regulation; and the critical importance of “political economy” conditions for business models to survive, beyond formal structure and value creation processes: “A business model only survives when the interests of particular stakeholders [...] are sufficiently met.” (Froud et al., 2016, p. 8). Diversity-enhancing policies should thus be placed within a broader context of institutional and social reform.

References

- Acharya, V. (2009). A theory of systemic risk and design of prudential bank regulation. *Journal of Financial Stability*, 5(3), 224–255.
- Acharya, V. V., & Yorulmazer, T. (2007). Too many to fail – An analysis of time-inconsistency in bank closure policies. *Journal of Financial Intermediation*, 16, 1–31.
- Allen, F. A., Carletti, E., & Babus, A. (2013). Asset commonality, debt maturity and systemic risk. *Journal of Financial Economics*, 104(3), 519–534.
- Allen, F., & Carletti, E. (2013). What is systemic risk? *Journal of Money, Credit and Banking*, 45(1), 121–128.
- Arnold, B., Borio, C., Ellis, L., & Moshirian, F. (2012). Systemic risk, macroprudential policy frameworks, monitoring financial systems and the evolution of capital adequacy. *Journal of Banking and Finance*, 36, 3125–3132.
- Ayadi, R., Schmidt, R. H., & Carbó Valverde, S. (2009). *Investigating diversity in the banking sector in Europe. The performance and role of savings banks*. Brussels: Center for European Policy Studies.
- Ayadi, R., Llewellyn, D., Schmidt, R. H., Arbak, E., & De Groen, W. P. (2010). *Investigating diversity in the banking sector in Europe. Key developments, performance and role of cooperative banks*. Brussels: Center for European Policy Studies.
- Baker, A. (2013a). The gradual transformation? The incremental dynamics of macroprudential regulation. *Regulation and Governance*, 7(4), 417–434.
- Baker, A. (2013b). The new political economy of the macroprudential ideal shift. *New Political Economy*, 18(1), 112–139.
- Bakir, C., & Woo, J. J. (2017). *Introduction to the special issue. Politics and Society*.
- Beale, N., Rand, D. G., Batten, H., Croxson, K., May, R. M., & Nowak, M. A. (2011). Individual versus systemic risk and the regulator’s dilemma. *Proceedings from the National Academy of Sciences of the United States of America*, 108(31), 12647–12652.
- Beck, T. H. L., De Jonghe, O. G., & Schepens, G. (2012). *Bank competition and stability: Cross-country heterogeneity. Discussion Paper 2012-085*. Tilburg University, Center for Economic Research.
- Berger, A. N., & Humphrey, D. B. (1997). Efficiency of financial institutions: International survey and directions for future research. *European Journal of Operational Research*, 98(2), 175–212.
- Blundell-Wignall, A., & Roulet, C. (2014). Macro-prudential policy, bank systemic risk and capital controls. *OECD Journal: Financial Market Trends 2013/2*.
- Borio, C. (2010). Implementing a macroprudential framework: Blending boldness and realism. *BIS Speech July*.
- Brunnermeier, M., Crockett, A., Goodhart, C., Persaud, A., & Shin, H. (2009). *The fundamental principles of financial regulation. Geneva report on the world economy* (vol. 11). London: ICBM, Geneva, and CEPR.
- Butzbach, O. (2014). Alternative banks on the margin: The case of building societies in the United Kingdom. In O. Butzbach & K. von Mettenheim (Eds.), *Alternative banking and financial crisis* (pp. 147–168). London: Pickering and Chatto.
- Butzbach, O., & von Mettenheim, K. (Eds.). (2014). *Alternative banking and financial crisis*. London: Pickering and Chatto.
- Carbó Valverde, S., Kane, E., & Rodriguez, F. (2008). Evidence of differences in the effectiveness of safety-net management of European union countries. *Journal of Financial Services Research*, 34, 151–176.
- Claessens, S., Ghosh, S. R., & Mihet, R. (2014). *Macro-prudential policies to mitigate financial system vulnerabilities*. IMF Working Paper 14/155.
- Clement, P. (2010, March). The term ‘macroprudential’: Origins and evolution. *BIS Quarterly Review*, 59–66.
- Crockett, A. (2000). Marrying the micro- and macroprudential dimensions of financial stability. *BIS Speeches*. 21 September.
- Davis, E. P., & Karim, D. (2009). *Macroprudential regulation: The missing policy pillar*. Brunel University National Institute for Economic Research Working Paper No 211.
- De Nicolò, G., Favara, G., & Ratnovski, L. (2012). *Externalities and macroprudential policy*. IMF Staff Discussion Notes 12/05.
- DeYoung, R., & Roland, K. P. (2001). Product mix and earnings volatility at commercial banks: Evidence from a degree of total leverage model. *Journal of Financial Intermediation*, 10(1), 54–84.
- Froud, J., Tischer, D., & Williams, K. (2016). It is the business model... Reframing the problems of UK retail banking. *Critical Perspectives on Accounting*. (in press).
- Gambacorta, L., & van Rixtel, A. (2013). *Structural bank regulation initiatives: Approaches and implications*. BIS Working Paper 312.
- García-Marco, T., & Robles-Fernández, M. D. (2008). Risk-taking behaviour and ownership in the banking industry: The Spanish evidence. *Journal of Economics and Business*, 60(3), 332–354.

- Gauthier, C., Lehar, A., & Souissi, M. (2012). Macroprudential capital requirements and systemic risk. *Journal of Financial Intermediation*, 21, 594–618.
- Haldane, A. G. (2009). *Rethinking the financial network*, Speech delivered at the Financial Student Association. Amsterdam.
- Hanson, S. G., Kashyap, A. K., & Stein, J. C. (2011). A macroprudential approach to financial regulation. *Journal of Economic Perspectives*, 25(1), 3–28.
- HM Treasury. (2010). *A new approach to financial regulation: Judgement, focus and stability*. London: TSO.
- Howlett, M., & Cashore, B. (2009). The dependent variable problem in the study of policy change: Understanding policy change as a methodological problem. *Journal of Comparative Policy Analysis: Research and Practice*, 11(1), 33–46.
- Howlett, M., & Lejano, R. (2013). Tales from the crypt: The rise and fall (and rebirth?) of policy design. *Administration & Society*, 45(3), 357–381.
- Howlett, M., Mukherjee, I., & Woo, J. J. (2015). From tools to toolkits in policy design studies: The new design orientation and policy formulation research. *Policy and Politics*, 43(2), 291–311.
- Lall, R. (2012). From failure to failure: The politics of international banking regulation. *Review of International Political Economy*, 19(4), 609–638.
- Lim, C., Columba, F., Costa, A., Kongsamut, P., Otani, A., Saiyid, M., et al. (2011). *Macroprudential policy: What instruments and how to use them? Lessons from country experiences*. IMF Working Paper 11/238.
- May, R. M., Levin, S. A., & Sugihara, G. (2008). Ecology for bankers. *Nature*, 451(21), 893–895.
- Michie, J. (2011). Promoting corporate diversity in the financial services sector. *Policy Studies*, 32(4), 309–323.
- Michie, J., & Oughton, C. (2013). *Measuring diversity in financial services markets: A diversity index*. SOAS Center for Financial and Management Studies Discussion Paper no 113.
- Salas, V., & Saurina, J. (2002). Credit risk in two institutional regimes: Spanish commercial and savings banks. *Journal of Financial Services Research*, 22(3), 203–224.
- Schclarek, A. (2014). The counter-cyclical behaviour of public and private banks: An overview of the literature. In O. Butzbach & K. von Mettenheim (Eds.), *Alternative banking and financial crisis* (pp. 43–50). London: Pickering and Chatto.
- Underhill, J. (2015). The emerging post-crisis financial architecture: The path-dependency of ideational adverse selection. *British Journal of Politics and International Relations*, 17(3), 461–493.
- Van den End, J. W., & Tabbae, M. (2012). When liquidity risk becomes a systemic issue: Empirical evidence of bank behavior. *Journal of Financial Stability*, 8, 107–120.
- Wagner, W. (2010). Diversification at financial institutions and systemic crises. *Journal of Financial Intermediation*, 19, 373–386.
- Wagner, W. (2008). The homogenization of the financial system and financial crises. *Journal of Financial Intermediation*, 17, 330–356.
- Williams, C. A., & Conley, J. M. (2014). The social reform of banking. *Journal of Corporation Law*, 39, 459–895.
- World Bank. (2012). *Global financial development report 2013: Rethinking the role of the state in finance*. Washington, DC: World Bank.
- Young, K. L. (2012). Transnational regulatory capture? An empirical examination of the transnational lobbying of the Basel Committee on Banking Supervision. *Review of International Political Economy*, 19(4), 663–688.