

# Competition and Stability in Modern Banking: A Post-Crisis Perspective

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## **Abstract**

Competition has been suppressed for extended periods in banking and when it has been unleashed, financial stability has suffered. This paper elucidates the relationship between competition and stability in modern banking, with particular attention to the impact of digital technologies, and derives the policy consequences for regulation and competition policy.

**Keywords:** shadow banking, fintech, digital technology, crisis, run, regulation

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## 1. Introduction

In this paper, I examine the link between competition, stability, and the development of unregulated banking activity. The aftermath of the crisis has revived old issues and posed a host of new questions about the relationship between competition and financial stability, as well as between competition policy and regulation in banking. Competition has an important bearing on all the perceived failures associated with banking and the financial system, such as excessive risk-taking, credit overexpansion, exuberant growth, and bank misconduct. However, we should not forget that competition is also a key driver of efficiency. A recent case in point is the potential disruption of the banking sector by digital technology and fintech competitors. This development has the potential to put pressure on competition and stability in the financial system. New ways of providing financial services to customers could have a negative effect on the profitability of traditional banks. However, they could also lead to a more cost-effective and efficient banking system with better terms for customers.

Banking has been transformed from branches (brick and mortar) to information technology (hard information replacing soft), and highly specialized human capital. Banks and markets have become intertwined, with a higher proportion of intermediary activities becoming market-based. Banks face increased competition from other intermediaries in their core business. Indeed, shadow banking provides a competitive check on banking, but has also induced instability. A question is whether the digital disruption with new players such as *fintechs* and *bigtechs* will impair stability. In historical perspective, regulation has not been able to tame financial innovation and regulatory arbitrage, and the regulatory cycle of liberalization, crisis, re-regulation, and regulatory failure has continued. The question is whether we will ever learn to avoid this cycle.

I argue that competition is unequivocally socially beneficial, if regulation is adequate. However, a trade-off exists between competition and financial stability along some dimensions, due to regulatory failure, and it can be alleviated through better regulation. The increase in competition brought by the disruption of digital technologies will be no exception to his trade-off. The upshot is that regulation has to rise up to the challenge.

This article is organized as follows: Section 2 provides a very brief history of financial crises. Section 3 deals with the transformation of banking, focusing on the rise of shadow banking and financial innovation. Section 4 provides a selective overview of competition and stability in modern banking. Section 5 develops the need to coordinate prudential regulation and competition policy. Section 6 provides concluding remarks.

## **2. A brief financial history of crises**

Competition has been perceived as a source of instability in banking and the sector has been regulated tightly over extended periods, in particular after the Great Depression. Indeed, banking crises have followed liberalization episodes (Kaminsky and Reinhart, 1999). The emergence of unregulated banking activity, ranging from investment trusts, mutual funds, and more recently, securitization, has been often behind the development of instability and financial panics and crises. An example of this is the development of the Panic of 1907, which originated in New York.<sup>2</sup> The failure to corner the market for stock of United Copper Company in October 1907 triggered a panic, as banks that had lent money to the cornering scheme suffered runs, leading to the failure of Knickerbocker Trust Company, New York City's third-largest trust, and the subsequent spread of bank runs to regional banks across the country. The panic was directed at trust companies because of the high risk in trust portfolios, lack of access to the clearinghouse (recall that at the time the Federal Reserve had not been established), and lower reserves against deposits. This led the New York Stock Exchange to fall almost 50% from its peak the previous year. J.P. Morgan pledged capital and convinced other New York bankers to do the same in order to resolve the crisis.<sup>3</sup> This contingency led to the creation of the Federal Reserve.

Following the Great Depression, deposit insurance was introduced and the control of moral hazard was achieved using the activity restrictions of the Glass-Steagall Act and deposit rate regulation. Banking was regulated very tightly for a long period, but the development of

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<sup>2</sup> See Moen and Tallman (1992).

<sup>3</sup> In exchange J.P. Morgan got the acquisition of part of Tennessee Coal Iron by US Steel, approved without enforcement of the antitrust Sherman Act.

money-market mutual funds in the 1970s led to the potential instability of banks (because they could not remunerate sufficiently deposits). This development initiated a liberalization process, which was punctuated by the S&L crisis in the US and several banking crises worldwide.

In the run up to the 2007-2009 crisis, securitization and the huge development of shadow banking both on the asset and liabilities sides contributed to the situation. One hundred years after the development of the Panic of 1907, in October 2007, Northern Rock suffered a bank run after news that the bank had approached the government for liquidity support, becoming the first British bank since 1886 to fail due to a bank run. Before the crisis, Northern Rock had a business model based on a heavy reliance on wholesale financing and it suffered a modern run on the interbank market (distinctive from the queues of depositors trying to recover their money).<sup>4</sup>

In short, the lack of regulatory control of shadow banks in the past has provoked instability and induced crises. Let us see review in the next section how liberalization and technological change have transformed banking and how banks have responded to the challenge.

### **3. The transformation of banking**

#### **3.1. The changing banking business: liberalization, technological change, and shadow banking**

The banking sector has been exposed to profound technological and regulatory changes in recent decades, with a large expansion of the financial sector culminating in the crisis of 2007-2009. The trends that have characterized the banking sector are, among others, a movement toward a more market-based banking system, an increase in competition and securitization, and the rise of shadow banking and new competitors (such as *fintech* firms of late). Deregulation and liberalization, together with advances in information and communication technologies (ICTs), transaction processing, and saving options, have

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<sup>4</sup> Rochet and Vives (2004) provide a model of such bank runs.

profoundly influenced and determined this evolution. Banks have become more service-oriented and have faced competition from other intermediaries in their core business.

Shadow banks perform the functions of banks (maturity, credit, and liquidity transformation), but mostly in an unregulated way and, in principle, without the umbrella of a lender of last resort or public sector guarantees. Shadow banking decomposes the retail-deposit-funded and held-to-maturity lending conducted by traditional banks, into a more complex wholesale-funded securitization-based lending process. It includes shadow asset banks performing maturity and liquidity transformation (e.g., special investment vehicles and conduits investing in asset-backed securities and financed by commercial paper and repos) and shadow liability banks (e.g., money market funds that invest in commercial paper and repos). Shadow banks may obtain gains from specialization. For example, nonbank finance companies can be more efficient than traditional banks because of specialization and economies of scale in the origination, servicing, structuring, trading, and funding of loans.

Liberalization lifted controls on deposit rates and banking investment activities, leading to an increasingly globalized and integrated financial sector. The liberalization process that started in the 1970s in the US and up until the 2007-2009 crisis resulted in a large increase in financial intermediation. For example, when expressed as a percentage of GDP, financial assets of intermediaries in the US and the UK reached around 8.7% and 8.5% of GDP in 2007, respectively, from less than 5% in the late 1970s.<sup>5</sup> This increase in the size of the financial sector was helped by the growth of nonbanking institutions and unregulated banking activity. The share of financial intermediary assets held by depository institutions in the US has fallen sharply since financial deregulation, especially between 1980 and 2000, from around 63% in 1950 to around 33% in 2014, with the percentage falling below 30% from 2000 to 2007. In the eurozone, there was also a decrease from 64% in 1999 to around 51% in 2013. In the US, shadow banks account for around 50% of lending, while in the eurozone, they accounted for 25% in 2014. Banks have not lost in absolute terms; rather, they have given up market share in favor of the new intermediaries. In the United States, banks' relative

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<sup>5</sup> See Figure 2.1 in Vives (2016).

decrease is very strong, but it has stabilized, and banks have regained market share since the crisis, while in Europe the relative decrease has continued since 2003.<sup>6</sup>

To sum up, banks have seen their market share eroded but have proved resilient on the face of new competitors.

### 3.2. Financial innovation, shadow banking, and *fintech*

Thanks to liberalization and technological change, financial innovation created new products and delivery channels, boosting productivity, fostering economic growth, and creating new competitors for several segments of the banking business, as documented by Vives (2016, section 2.1.2) and Goetzmann and Rouwenhorst (2005). Nevertheless, while financial innovation has supported a higher efficiency in transactions and helped to diversify risk, it has also distorted incentives, allowed regulatory arbitrage, and augmented systemic risk. Beck et al. (2014), for example, provides a study of thirty-two countries for the period 1996-2006, finding that financial innovation is associated with higher levels of sector growth volatility, idiosyncratic bank fragility, and bank losses during the recent crisis. Countries with market-based financial systems, more competitive banking systems, and tighter regulatory frameworks tend to have stronger benefits, but also larger costs of financial innovation.

ICTs have brought innovation such as ATMs and online banking. More recently, however, a change in the use of technology to provide new services and business models is developing with the rise of the so-called fintech sector. Fintech may be understood as the use of innovative information and automation technology in financial services. New digital technologies automate a wide range of financial activities and, potentially, may provide new and more cost-effective products in parts of the financial sector, ranging from lending to asset management, and from portfolio advice to the payment system. Big data and the increasing use of artificial intelligence (AI) and digital technology are transforming the banking business and have the potential to disrupt established financial intermediaries, and banks in particular. It is, however, still too early to predict exactly how the industry will evolve and

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<sup>6</sup> See Section 2.2.2 in Vives (2016).

how it will affect the traditional banking sector. In China, for example, which is the largest fintech market, only amounts to 0.2% of the total capital market (Demertzis et al., 2017).

The application of new techniques could result in lower financial intermediation costs and improved products for consumers. Indeed, several studies have found that online origination technology allows fintech outlets to provide more convenience for their borrowers, and that fintech firms better screen potential borrowers using improved statistical models based on big data.

Buchak et al. (2017) show that fintech firms accounted for close to a third of shadow banking loan originations in the US mortgage market at the end of the period of study 2007-2015. They also estimate that fintech firms performed significantly better when setting interest rates, as these explained more of the variation in prepayment outcomes across borrowers for loans of fintech firms than for those of non-fintech intermediaries. Furthermore, ease of online origination appears to allow fintech lenders to charge higher rates, particularly among the lowest-risk, and presumably least price-sensitive (but most time-sensitive) borrowers. The increase in regulatory burden on traditional banks, in terms of raised capital requirements and legal scrutiny, explains about 55% of shadow bank growth in the period 2007-2015, and 35% of this dynamic is explained by the use of financial technology. Shadow bank lenders have expanded among borrower segments and geographical areas, such as high-risk, low-creditworthiness Federal Housing Administration (FHA) borrower segments and low-income and high-minority areas, in which regulatory burdens made lending more difficult for traditional, deposit-taking banks. Buchak et al. (2017) also find that traditional banks have a somewhat lower shadow cost of funding and provide higher quality products than shadow banks, but still lose market share because of their increased regulatory burden. In this way, shadow outlets profit from the situation and rely on both explicit and implicit government guarantees, since by 2015 about 85% of their mortgage loans were sold to Government-Sponsored Enterprises (GSEs) after origination. This fact points out that entry into the intermediation business with new technologies will very much depend on how regulation and government guarantees are applied.

We see thus that the impact of new technologies is very much mediated by regulation and the presence of government guarantees. New entrants and digital technologies will augment competitive pressure but may also allow to price discriminate more effectively. The response of incumbent (traditional) banks may be either to prevent the entry of newcomers or accommodate them and share the market. As an example, in the case that a new entrant may want to offer complementary or differentiated services but would have to rely on the payment infrastructure of the incumbent bank, the latter may have incentives to raise the cost of entry. It could do so by degrading the interconnection with the incumbent's infrastructure. Conduct of business/access regulation of infrastructure by incumbent banks will prove crucial in this respect. In contrast, a new entrant may want to provide services to specific segments of the population, such as technology-savvy or even unbanked consumers, so an incumbent might want to behave as a "peaceful fat-cat" in order to protect the profitability of its large customer base. The point is that the behavior and strategies of both incumbent and fintech firms will have an effect on how the sector develops. The strategies will depend on whether investment makes a company tough or soft in the competition and whether competition involves strategic substitutes or complements. For example, accommodation or partnership with entrants will work if the cut in revenues to established banks for each purchase with a fintech platform is more than compensated by an increase in aggregate transactions. The consequences for the profitability of incumbent banks will depend on the strategies adopted and this will have consequences for stability, as we will see in the next section.

#### **4. Can we have both competition and stability in banking?**

The standard full information competitive paradigm does not apply to banking because it features the whole range of market failures: asymmetric information, market power, externalities, and consumers and investors who are subject to behavioral biases. All these factors induce a misalignment between private and social objectives in banking. Thus, even though competition is a source of efficiency in general, its increase will improve social welfare only if the other sources of market failures are controlled and eliminated. Both regulation and competition policy should consider this fundamental fact. In particular, increasing competitive pressure may backfire by boosting instability through two channels:



(1) by increasing incentives to take risk and raise failure probabilities (asymmetric information market failure), and (2) by exacerbating coordination problems between depositors/investors and fostering runs/panics (an externality market failure). We look at the literature relating to each of these in turn.

#### 4.1. Competition and incentives to take risk

Generally, banks have excessive incentives to take risks in the presence of *limited liability* (for shareholders and managers) and *moral hazard* (non-observable risk on the asset side). The problem is particularly acute for banks close to insolvency and/or bankruptcy. Indeed, limited liability implies that banks will take excessive risk on the asset side, unless the bank's risk position is observable and can be assessed. A bank, in this situation, can increase neither its market share nor its profits by taking more risk, because investors will be aware of it and will demand compensation. However, if there is deposit insurance with premia independent of risk (flat) or implicit insurance with bailouts and too-big-to-fail (TBTF) policies, the disciplinary effect of the market is destroyed since this insurance eliminates the incentives of investors—whether depositors or debt holders—to monitor banks.

Modern banking has an increased capacity to take risk and compete more fiercely, since a higher proportion of activities are market-based. The movement from soft to hard information and from retail deposits to wholesale finance may generate more instability. Hard information erodes traditional relationship banking (mostly based on soft information), and increases the weight of trading in banks' balance sheets, since codifiable information makes business more scalable. The result is that a larger scale of operation more than compensates lower per-unit profits. New competitors are able to use hard (codifiable) information and erode the traditional bank-customer relationship.<sup>7</sup>

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<sup>7</sup> We are very far from the response of J.P. Morgan to Samuel Untermyer in the Pujo Committee in 1913:

Untermyer: *Is not commercial credit based primarily upon money or property?*

J.P. Morgan: *No, sir. The first thing is character.*

U.: *Before money or property?*

J.P.M.: *Before money or anything else. Money cannot buy it... A man I do not trust could not get money from me on all the bonds in Christendom.*

Regarding the effect of rivalry on risk-taking, it has been documented that intense competition may worsen the problem of excessive risk taking, as profits provide a buffer and increase the bank's charter or franchise value (Keeley, 1990). In a dynamic setting, where a failing bank may be shut down, market power enhances the discounted value of its future profits, making the institution more conservative. That is, a bank with more market power enjoys higher profits and has more to lose if it takes more risk, fails, and its charter is revoked. Therefore, it prefers not to take risks.<sup>8</sup> Beck et al. (2013) find, on average (for 79 countries in the period 1994-2009), a positive relationship between a bank's market power (Lerner index) and their stability, as measured by the bank's distance from insolvency. However, the charter value effect may be more limited in banks more exposed to trading, since they may have incentives to bet retail franchise value in the market (Boot and Ratnovski, 2016).

In addition, intense competition aggravates the asymmetric information problem and leads to riskier portfolios and higher failure probabilities. More rivalry may reduce incentives to screen and monitor borrowers as the bank has fewer informational rents (Allen and Gale, 2004). In addition, more rivalry can increase the chance that bad borrowers obtain credit by limiting the screening ability of each bank due to the winner's curse problem. This is so since more competition worsens the adverse selection problem that a bank faces when giving a loan, as a higher loan rate set by a bank tends to worsen the quality of firms accepting the loan. A borrower will accept a higher loan rate posted by a bank only after facing rejections by other banks that set lower rates. Therefore, this borrower will have, on average, a low creditworthiness (see e.g., Broecker, 1990; Riordan, 1993; Márquez, 2002; and Hauswald and Márquez, 2006). In the case of digital lending platforms that match demand and supply of funds, scale is important since these platforms make money out of fees, rather than interest margins, and operate with high fixed costs and low marginal costs. The platforms need to attract both sides of the market and will tend to charge more the less elastic side, in this case the borrowers. Higher fees may then attract worse risks aggravating the adverse selection problem.

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<sup>8</sup> See e.g., Allen and Gale (2004), Hellman et al. (2000), and Matutes and Vives (2000).

On the other hand, there is evidence that better finance terms for firms may induce entrepreneurs to exert more effort, thus increasing the return on their investment (this is a risk-shifting effect), as seen in Caminal and Matutes (2002), and Boyd and De Nicoló (2005).<sup>9</sup> This effect of a more competitive loan market works in favor of stability. As a result, there is a U-shaped relationship between competition and the risk of bank failure. Indeed, lower rates reduce the banks' revenues from non-defaulting loans (a margin/charter value effect). When the number of banks is small, the risk-shifting effect dominates, and when the number of banks is sufficiently large, the margin effect dominates (Martinez-Miera and Repullo, 2010). The U-shaped relationship has been documented empirically by Carbó-Valverde et al. (2013), Fernández de Guevara and Maudos (2011), and Jiménez et al. (2013).

#### Market expansion and credit oversupply

One of the alleged causes of the subprime crisis of 2007-2009 is the overexpansion of mortgage credit to people who later had trouble paying back the loans. This phenomenon can be traced to selection problems in the credit market. Informational asymmetries between banks and borrowers, and across banks, generate adverse selection problems. When markets expand, new borrowers with unknown characteristics enter the market, as in the run up to the 2007-2009 crisis. Dell'Ariccia and Marquez (2006) show that when the proportion of unknown borrowers is low, banks will screen borrowers by demanding a high collateral requirement. However, when this proportion is high, as when there are more new projects in the market, banks will require no collateral. The reason is that when the proportion of new projects increases, the distribution of borrowers applying to each bank improves (that is, there is favorable selection, since the proportion of borrowers with projects rejected by other banks has decreased). In this situation, banks lower collateral requirements to compete and increase market share. In short, when the proportion of borrowers with unknown characteristics in the market is high, banks will relax lending requirements, reduce screening, offer contracts with no collateral requisites, and expand credit. This results in deteriorating loan portfolios, lower

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<sup>9</sup> In Wagner (2010), the effect is reversed when banks can adjust their loan portfolios, since when borrowers become safer, banks take on more lending risk.

bank profits, and larger probabilities of a systemic crisis. It explains why situations or policies that generate an influx of borrowers, like an expansionary phase of the economic cycle or generous housing allowances, may end up generating crises and instability, with banks more vulnerable to aggregate shocks.

With regard to competition, an increase in rivalry may have similar effects to the influx of new borrowers, inducing an incumbent monopolistic bank to switch from screening to pooling of loan applicants in order to keep its market share and exploit its informational advantage, as shown by de Meza and Webb (1987). Mahoney and Weyl (2014) point out that the riskiest customers in the housing market are the least likely to seek credit and are attracted only by the generous offers of low down payments and teaser starting rates that banks use to attract more profitable customers. In a situation of favorable selection, where the marginal borrower is a worse credit risk than the average borrower, fierce competition is detrimental to welfare.

Other factors that reinforce risk taking are behavioral biases of consumers toward over-borrowing (e.g., Heidhues and Koszegi, 2010; Grubb, 2015), and loose monetary policy. The behavioral biases survive competition since the rents generated by unsophisticated consumers distort the competitive process. Furthermore, when liquidity is abundant, loan officers have incentives to be lax in lending, and loose monetary policy will thus lead to overexpansion of balance sheets and excessive risk taking, as shown by Diamond and Rajan (2012), Acharya and Naqvi (2012), and Dell’Ariccia et al. (2014).

#### 4.2. Competition and coordination problems

Competition may increase coordination problems between investors by increasing the strategic complementarity of their actions, leading to illiquidity for banks and increased systemic risk. For example, when a weak entity competes to attract funds under deposit insurance, it elicits an aggressive response from other banks, which also increase their deposit rates, reduce margins and hence raise systemic risk. Ultimately, runs can happen independently of the level of competition; however, more competitive pressure does worsen coordination problems of investors/depositors by increasing the degree of strategic

complementarity of their actions. This raises potential instability and the probability of crisis, the range of fundamentals for which there is coordination failure, and the impact of bad news on fundamentals (Vives, 2014).

Matutes and Vives (1996) show how, even though monopolies may suffer a run, an increase in rivalry raises the probability of failure. In a model that combines Diamond's 1984 banking model with a differentiated duoplistic structure à la Hotelling, they show how depositors' expectations in the presence of diversification-based economies of scale determine the probability of a bank failing endogenously. The presence of a coordination problem between depositors (much as with networks externalities) does not depend on market structure and leads to multiple equilibria. However, an increase in rivalry raises the probability of failure in an interior equilibrium of the depositor's game, where banks are direct competitors and have positive market shares. Deposit insurance eliminates the coordination failure of depositors and vertical differentiation among banks; and in that case, competition boils down to the usual Hotelling competition market with a unique equilibrium. Insurance at fair rates enhances rate competition and raises the probability of failure when banks are direct competitors; and insurance may preclude the realization of diversification economies when the market outcome has some inactive banks. The consequence is that deposit insurance does not necessarily raise welfare. Deposit insurance, however, extends the market when it is not fully covered; in short, it has an ambiguous welfare impact.

Egan et al. (2016) provide a test of a model related to Matutes and Vives (1996) with US bank data for the period 2002-2013, and confirm that systemic expectational contagion with banks linked through competition for a pool of deposits leads to multiple equilibria. Across equilibria, the survival probabilities of banks and deposit interest rates differ substantially. Instability of a bank spills over to other banks via competition for deposits. The demand for uninsured deposits—but not for insured ones—declines with the financial distress of the bank. A distressed bank offers high-insured deposit rates, since the deposit insurance fund will bear the cost of failure, and the rival banks also offer higher rates to compete with the distressed bank. This in turn raises the distress probability of the rival banks.

An example of coordination problems is the run on the shadow banking system in 2007. This can be seen as a *double run* initiated by a collapse of shadow asset banks (structured investment vehicles -SIV- and conduits investing in mortgage-based securities, financed by commercial paper and repos) contaminating, via a repo run, shadow liability banks (Money Market Mutual Funds that invested in the repos and commercial paper. The run was triggered by accumulating bad news about subprime mortgages (bankruptcies and earning warnings from originators, downgrading of ratings for residential mortgage-backed securities [RMBS] and collateralized debt obligations, and losses for hedge funds). Those were reflected in a sharp decline in 2007 in the ABX family of indexes (which had been launched in January 2006 to track the evolution of RMBS). The accumulated bad news reflected in the ABX indexes culminated in the panic of August 2007, when BNP Paribas froze redemptions from a fund. A spike in interbank rates followed, and the market for asset-backed commercial paper (ABCP) collapsed. As short-term financing of SIVs and conduits dried up, bank sponsors intervened and absorbed many of these vehicles onto their balance sheets.

The decline in the ABX indexes was a rallying point for investors to run for the exit. The phenomenon can be explained by studying the determinants of the co-movements of the actions of the investors (i.e., the degree of strategic complementarity of investors' actions). Strategic complementarity increases when public information is more precise. The effect is reinforced if the asset side of a financial intermediary is opaque, as in the typical SIV, and the information of private investors is poor (Vives (2014)). Then, a strong public signal (like the ABX indexes) will significantly increase strategic complementarity and fragility. Indeed, the release of the ABX indexes increased the precision of public information about RMBS and therefore strategic complementarity in the actions of investors in SIVs and conduits in a context where balance sheets were fragile with excessive short-term leverage. To compound the problem, fire-sale penalties became high during the crisis. All these effects contributed to enhanced strategic complementarity that, together with increased competitive pressure, resulted in augmented fragility.

In summary, competition can affect stability both through the asset and liability sides of the balance sheet of a bank by, respectively, impairing profitability and eroding the charter value

of a bank and by accentuating the co-movement of the actions of investors. Let us check in the next section how prudential regulation and competition policy have to interact in this context.

## **5. Prudential regulation and competition policy**

In advanced economies, prudential regulation and safety nets have been put in place to preserve the stability of the banking system. Prudential regulation includes entry requirements and fit-and-proper rules to conduct banking business, capital and disclosure requirements, and supervision. The introduction of competition in banking was accompanied by the introduction of several other policy changes, including checking risk taking with capital requirements, allowing banks to rely on their own internal models to assess and control risk, and including disclosure requirements for financial institutions in order to increase transparency and foster market discipline. The 2007-2009 crisis put the whole scheme into question.

A piecemeal approach to prudential regulation will not work (Vives (2014)). This is because capital, liquidity, disclosure requirements, and macro-prudential ratios must be considered together, also taking into account activity restrictions, if there are present. Indeed, both capital and liquidity requirements work toward controlling the probability of insolvency and illiquidity, and they have to be set together. If assets are opaque and investors conservative, liquidity requirements should be tightened in the presence of higher disclosure levels or strong public signals. In this case, this would allow a lessened solvency requirement to keep the same probabilistic tolerance to insolvency and illiquidity. However, solvency requirements must be strengthened and liquidity requirements untouched in the face of increased competition to keep the same regulatory tolerance levels.

An example of the first instance is provided by the run on SIVs in 2007. In this situation, with an enhanced public signal (ABX indexes) that could serve as a rallying point to induce runs, the regulator should have increased liquidity requirements to limit early liquidation of assets (and relaxed capital requirements somewhat since they are partially substitutable). The Financial Stability Board (FSB) review on shadow banking 2016 (FSB, 2017a) stated that

more effort was necessary to ensure that disclosure requirements were adequate for the market to absorb any news in a timely manner and make informed investment decisions. This would reduce “the chance of a sudden loss of confidence that may lead to runs.” Here again Vives (2014) analysis implies that the FSB should link enhanced disclosure with enhanced liquidity requirements.

Many crises provide an example of the second instance where capital charges should have accounted for the degree of rivalry, with tighter requirements in more competitive situations. Had this rule being followed, the probability of occurrence of crises, such as the S&L crisis in the 1980s in the US or the 2007-2009 crisis, would have decreased. One implication is that competition policy that eases entry and increases contestability by lowering switching costs and improving transparency may have to be accompanied by tougher prudential requirements.

The competition-stability trade-off in the face of imperfect regulation implies the need to coordinate regulation and competition policy. Regulatory design has to take into account the intensity of competition. For example, capital charges should account for the degree of friction and rivalry in the banking environment, with tighter requirements in more competitive situations. This would have decreased the probability of occurrence and/or lessened the impact of crises such as the S&L crisis in the 1980s in the US or the 2007-2009 crisis, which were preceded by a long period of deregulation together with decreased bank capital. One implication is that competition policy that eases entry and increases contestability by lowering switching costs and improving transparency may have to be accompanied by tougher prudential requirements.

I illustrate the need to coordinate competition policy with prudential regulation with three examples. First, the prudential authority, by imposing restrictions on the actions of banks, may in fact make competition more effective in delivering consumer and investor welfare in a range of situations. Market-based banking, where the market may have a natural oligopoly structure, provides a first example. In this case, a policy to force restructuring may not be effective and activity restrictions to control risk-taking may be needed as well. A second



example is when banks bid for deposits, exploiting deposit insurance, inducing other banks to respond, and increasing systemic risk, as we have seen above. In this case, the prudential authority may limit this excessive competition by capping deposit rates in a prompt corrective action frame. The extreme case is when distressed banks approach insolvency and the trade-off between competition and stability is greatest; then those banks should be tightly regulated and their activities restricted. The potentially superior measure that imposes risk-sensitive deposit insurance premia on entities may be difficult to implement in terms of calibration, particularly if premia have to include a component reflecting the contribution to the systemic risk of the entity. The entities may also be able to circumvent the charges by offering products that are not formally insured but may be implicitly. A third example is when, in expansions, banks have incentives to over-lend and consumers to over-borrow. In this case, prudential rules limiting the amount of a mortgage loan that can be given as a percentage of the value of the house, or consumer protection rules restricting the choice that intermediaries can offer consumers may be in order. They represent a restriction of competition among banks but avoid credit oversupply and the build-up of risk in the real-estate sector.

Second, prudential regulation (and supervision) along with competition policy have to work in tandem so that the former does not impose a barrier to new entrants (e.g., fintech outlets), but still keeps a level playing field in terms of regulating the same functions equally.<sup>10</sup> Light regulation of shadow banks (including fintech, to encourage entry), when coupled with housing subsidies, will increase systemic risk (recall that GSEs in the US dispose of close to 90% of mortgage loans of shadow banks). The challenge for regulators and governments is to find effective regulatory environments and policies that promote innovation and a level playing field between incumbents and new entrants while preserving financial stability.<sup>11</sup>

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<sup>10</sup> The European approach to deal with the fintech sector is to have the same rules and supervision for the same services independently of who is providing them. However, current regulation and supervision is geared toward institutions rather than products and services. One reason is that institutions may fail, generating systemic problems. The present tendency to regulate new services provided by fintech is to offer a “regulatory sandbox” in order for fintech firms to experiment without the heavy regulation of the banking sector, and for regulators to discover the best way to keep the activities safe.

<sup>11</sup> So far, the Financial Stability Board (FSB, 2017b) did not find reason to worry about financial stability at this stage. It pointed out that there is an enhanced prospect for systemic problems arising out of operational risk and cyber risk with fintech activities.

Third, consumer protection comes to the forefront<sup>12</sup> and should be coordinated with competition policy since they both aim to improve the welfare of consumers and investors. In the UK, the Financial Conduct Authority (FCA) deals both with competition and consumer protection issues in the banking sector, while in continental Europe consumer protection in banking is typically dealt with by the prudential authority. The latter approach is a source of conflict of interest since there may be tension between the benefit to the consumer and financial stability.<sup>13</sup>

In brief, the trade-off between competition and stability implies the need to coordinate prudential regulation and competition policy. The impact of digital technology and new entrants present new challenges to both policies to keep a level playing field among competitors and protect consumer interests.

## **6. Concluding remarks**

Banking should not be protected from competition. Indeed, competition in banking is good for society provided that regulation and supervision are adequate, as it fosters efficiency and provides new services, weeds out inefficient institutions, and limits rent-seeking in the sector. However, regulators should be cautious about the development of shadow banking and unregulated banking activity, as it can have pervasive effects on systemic risk and instability. Governments and regulators should also take note of the potential effects that the rise of fintech (and the entry of bigtech firms such as Amazon and Google) may have on the banking system. There is a delicate balance between fostering entry and keeping a stable banking sector. A potential danger is that incumbents' profits are eroded they will try to compensate by taking more risk.

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<sup>12</sup> This is so, lately in particular with regard to data privacy and cybersecurity where the tendency is to give customers more control of their data (e.g., the Payments Services Directive II [PSD II], the General Data Protection Regulation in the EU, Open Banking in the UK, and commercial banking aggregator models in the US).

<sup>13</sup> A typical example of the tension is how a high margin for a banking product may be looked at favorably by the prudential regulator but unfavorably by the consumer or competition one.

There exists a trade-off between competition and financial stability along some dimensions due to regulatory imperfections or regulatory failure. However, well-designed regulation may alleviate the competition and stability trade-off; unfortunately, it is highly unlikely to eliminate it. There is ample room for regulation to improve the alignment of social and private incentives, and better regulation and resolution should allow for more competition while not hurting stability. To start, regulation should take into account the interactions between the different instruments used, and in light of a residual competition-stability tradeoff, coordinate prudential regulation and competition policy. Capital requirements should be strengthened in more competitive environments, such as when new competitors enter the market, and liquidity requirements augmented with higher disclosure levels. Other key elements of better regulation may be the elimination of hidden subsidies that distort competition, both to incumbents and entrants (in particular in the housing market), and the establishment of regulatory measures that take into account the observable risk positions of financial institutions (for example, in deposit insurance premia).

All this is necessary to keep the increased risk-taking capacity of modern banking in check, while society profits from technological advances and rivalry in the provision of financial services.

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