

Financial innovation: economic growth versus instability in bank-based versus financial market driven economies¹

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1. Introduction

The impact of financial development on economic growth is an important public policy issue. A key issue is whether financial development spurs economic growth, or even is a prerequisite for economic growth? As is by now well established, financial development is an important facilitator of economic growth. Having well functioning financial institutions (and markets) is considered important for the economy at large and the financing of corporations in particular. Also financial instruments – as manifestations of financial development – can be of considerable importance. In particular, some financial instruments are explicitly designed to facilitate underlying real transactions. For example, commercial letters of credit are an indispensable part of import-export transactions. These instruments effectively guarantee payment upon delivery of goods which make exporting companies willing to let go of their goods. The dramatic contraction in world trade during the financial crisis may have been fuelled by the collapse of banks and hence their ability to provide credible guarantees.

The question to this paper is therefore not whether financial development is important for economic growth. It obviously plays a role. The question is what this role exactly is, and particularly how to look at the proliferation of financial innovations which appear to have become the most visible manifestation of financial development in recent times. Financial innovations seem an inherent part of financial development, but has the unprecedented level of financial innovation in the last decades been good for economic growth? No readily available answers come to mind. Obviously, when looking at the last few years with the economic crisis at the center of our attention, it seems hard to argue that recent innovations like subprime mortgages and their repackaging in marketable securities has been good for economic growth. But also this is not carved in stone.

In this context, I also seek to address what differential impact can be expected in bank-based versus financial market driven economies.

¹ I thank participants in the The Hague AWT meeting on Finance and Innovation (February 1, 2010) for comments. Particular thanks go to Paul van Diederer, Luc Soete, Rens van Tilburg and Paul Tang.

What appears to be true is that the financial sector operates as a business in itself rather than just a facilitator for the ‘real’ economy. Stiglitz puts it succinctly: “the financial sector has become an end in itself rather than a means to an end” (Stiglitz, 2010). This might not be surprising, and is hardly new. The financial sector is a commercial profit-seeking activity driven by high-powered individuals. As we know from agency-theory, individuals (at least in part) are driven by self-interest and that may deviate from the collective interests of society. Hence, financial institutions look for profitable opportunities, and those may not coincide with choices that optimally facilitate the real economy. I will argue that particularly the proliferation of information technology has facilitated much more rapid changes in strategies and actions of financial institutions adding friction to their privately optimal actions and the interests of society. The severe disruption in the 2007-2009 financial crisis clearly points at such behavior.

Equally importantly, the financial sector at large might gain true power and influence in society, and even some crowding-out of other economic activities may occur. OECD statistics are in this context interesting. They show a substantial increase in direct contribution to GDP coming from financial services in recent decades (OECD, 2009). If crowding-out plays a role, this direct contribution could be at the expense of their facilitating role. A manifestation of this is that banks give less priority to their relationship-oriented business (e.g. SME lending) and more to transaction-oriented banking. But also more indirect types of crowding-out are possible. An example of the latter is that the most talented students in period 2003-2007 increasingly chose for careers in banking, and often pure transaction banking (predominantly present in investment banking). This could be interpreted as a crowding-out of talent at the expense of the real economy. Similarly, the boom in the financial sector during those years diverted massive resources to this sector. For example, many countries came to see the financial sector as a growth engine of their economies and chose to allocate scarce public resources to subsidizing this sector. In my own country – The Netherlands – for example substantial public investments were made to improve the attractiveness of the country as location for financial services firms. To the extent that these investments were at the expense of other sectors, a true crowding out has occurred. In this respect, also the enormous lobbying power of the financial services sector is noteworthy.²

² Financial institutions may go for self-preservation. For example, any player in the financial sector might seek to become a power bastion by itself, try to be indispensable and become self-serving.

Nevertheless, the literature rationalizing the role of financial markets and financial institutions essentially has the financial sector serve as facilitator. It facilitates businesses in their funding needs, allows for diversification, and serves as liquidity provider. The financial sector either acts as broker (e.g. passing through money by bringing together buyers and sellers of securities, or helping firms raise money in the financial markets), or as asset transformer (e.g. intermediating liquidity risk by transforming (more) liquid liabilities in term loans). The latter distinction is particularly relevant because financial systems are often characterized as either being bank-based (continental Europe) or financial market driven (US, UK). In the former, bank financing is dominant while direct funding from the financial market plays a more important role in the latter. The distinction is not as sharp as the dichotomy might suggest, e.g. more than half of US businesses is bank-financed; hence no system is fully market or bank-driven. But the distinction is relevant, and an important question is whether the more recent proliferation of financial innovations might impact those systems differently. In particular, financial innovations have intertwined banks and financial markets and this, as I will argue, might have impacted bank-based and financial market driven economies differently, and could have implications for stability.

A fundamental feature of recent financial innovations is that they typically are aimed at augmenting marketability. Such marketability can augment diversification opportunities, yet can also create instability. Facilitating marketability is a core element of the most noteworthy innovations that have become infamous during the 2007-09 financial crisis (securitization resulting in securities like CDOs, ABCP, and CDS). An important observation is that marketability is not always good. The mere fact that something becomes tradable can undermine commitment. For example, mortgages that become tradable might undermine the incentives of the originator to monitor the quality of borrowers. Or, more fundamentally, when markets exist for all kinds of real assets of a firm, a firm can more easily change direction of strategy. This might be good, but could also lead to lack of commitment (and staying power), more impulsive decisions and possible herding. The latter refers to the tendency to follow current fads.³

³ In banking herding is particularly worrisome because it could create systemic risk. Meaning, when all institutions make the same bets, risk exposures become highly correlated and a simultaneous failure of institutions becomes more likely.

The organization of the paper is as follows. In section 2, I first add some further thoughts to the link between financial development and economic growth.

Section 3 focuses on bank-based versus financial market driven economies. Part of the discussion here is to uncover the role that banks play in the economy. How does this relate to the role that financial markets play? That is, how to compare bank-based to financial market focused economies? These questions are important from the perspective of analyzing the link between financial development and economic growth, and more specifically for the role that more recent financial innovations play.

The dichotomy between a bank-based system and a financial market-driven economy appears to have been weakened. In particular, recent innovations like securitization have made banks' assets more marketable and increased the sensitivity of banks to financial market developments. Banks have thus become a more integral part of financial markets. This observation will turn out to be important because the stronger links between banks and financial markets might well have destabilized banks. Securitization – a type of financial innovation⁴ – is at the root of this. This brings me to the question what impact financial innovations – as manifestation of a more advanced financial development – have. This might challenge the largely positive view of financial development.

Nevertheless, as I will first show in section 4, there is a core literature that convincingly argues that financial innovations can – in principle – contribute to economic growth. An important element of this is the discussion in the modern finance literature on the 'spanning' that innovations can facilitate. That is, financial innovations can help complete markets, and this could augment social welfare. However, more recently, a more negative image has come up. Financial innovations could have a destabilizing impact; the financial crisis of 2007-09 is arguably a manifestation of this.

Section 5 asks the question what causes innovations to be potentially value destructive. This asks for an understanding how innovations come about. What drives the creation of new financial innovations? A fundamental feature that comes up here is the marketability that recent financial innovations typically aim for. As already eluded to, this marketability may have a dark side and create instability.

⁴ To be more exact, securitization could be seen as a process innovation. The asset backed claims that it creates and that are being sold to investors could be called financial innovations.

Section 6 seeks to put these insights together particularly by comparing the implications of financial development and innovation for the more bank-based economies of continental Europe to those for the financial market driven economies of the UK and the US.

2. Financial development and economic growth

An interesting question about the relationship between financial development and economic growth is one of causality. Arguably, one could say that this is even the key question in much of the older literature, and one with strong controversies. On the affirmative side, John Hicks (1969) and Joseph Schumpeter (1912) see a strong causal link from financial development to economic growth. Yet, other eminent economists, most notably Joan Robinson (1952) and Robert Lucas (1988), are very much skeptical about this causality and argue that financial development largely *follows* economic development. This is not an innocent controversy.

Most notably, in recent discussions (see for example Buiter, 2009) it is argued that modern macro economics – e.g. the Dynamic Stochastic General Equilibrium (DSGE) type of models – do not give much of a role to the financial sector. Since Robert Lucas is one of the founders of these class of models, this might not be surprising. What it means is that these models largely ignore the financial sector and issues related to financial development cannot readily be analyzed in such models (let alone things related to financial innovations). As a caveat, one should not take the critique on the DSGE models to the extreme; some efforts have been made to include financial mechanisms like the financial accelerator (Bernanke and Gertler, 1990).

Nevertheless, in light of the recent financial crisis, questions are raised about the desirability to enrich these models by giving a distinct role to the financial sector. It might help add understanding to the functioning of the economy, and possibly affect policy implications that would follow from such models. The lack of importance of the financial sector in macro-economic research (not surprisingly) also shows up in recent textbooks.⁵

⁵ Central to much of the work in macro economics are the real business cycle theories and new-Keynesian theories. Following recent textbooks like Galí (2008) and Mankiw (newest edition of his macroeconomics textbook just now being published, 2009) one notices that the financial sector does not play a role in their treatment of business cycles and new-Keynesian theories. Apparently insights developed by Greenwald and Stiglitz (1987 and 1993) on the real world implications of asymmetric information in financial markets, and insights coming from Bernanke and Gertler (1990) on the effect of capital market imperfections on the monetary transmission mechanisms (and the banks' role in the allocation of credit) have not reached main stream textbooks.

A more fundamental view at the importance of financial development could help. In a frictionless (perfect) world financial development is not important. In such world no impediments to an optimal resource allocation exist. What that really means is that information and transaction costs are non-existent. That is, firms have a frictionless access to finance, diversification can be accomplished at no cost, so can the enforcement of contracts and the behavior of firms being financed. Financial development matters because all these things are not automatically satisfied, or rather never satisfied; improvements are always possible and this is what financial development could add to.

The lack of focus on financial development in macro-economics is therefore a direct artifact of the lack of frictions that it perceives. This has created a dichotomy with micro economics that has very much focused on imperfections. In terms of being relevant for policy this has made macro economists somewhat ineffective. In particular, they may have not given enough support for an institutional design (including regulation) that can contain the imperfections (i.e. incentive problems) that micro economists did focus on.

In any case, the suggestion that financial development plays a secondary role is surprising in light of the strong links between economic and financial development that were already observed many years ago. Goldsmith (1969), for example, concludes based on data over the period 1860-1963 that periods of more rapid economic growth go hand in hand with an above average rate of economic development. Strictly speaking, this says nothing about causality, but neither does it refute a potentially important (leading) role for financial development. In an extensive review of all relevant pre-1995 work Ross Levine concludes that “A growing body of work would push even most skeptics towards the belief that the development of financial markets and institutions is a critical and inextricable part of the growth process and [would push those skeptics] away from the view that the financial system is an inconsequential side show, responding passively to economic growth and industrialization” (Levine, 1997; see also Levine 2005).

In more practical terms, the consensus that has formed views financial development as an important facilitator of economic growth. What has emerged is that economic growth may need simultaneous financial development. This conclusion has translated into the understanding that lack of speed of adjustment in the financial sector might hinder economic growth. The concern is then that sudden real economy needs may not be met because the

financial sector might only slowly adjust to the needs of the real economy. This is an interesting question because it bypasses the discussion about causality. That is, even if real economic developments are leading, the financial sector development determines whether the real economy can continue its growth path. A sequentially (over time) shifting causality between economic growth and financial sector development then follows. From this perspective, it would seem obvious that financial development is good. As we will see, this is not always the case.

An issue that is not, or barely discussed in the financial development and economic growth literature is the type of financial development, i.e., institution-based (say, banks) versus market based (financial markets) financial development. This issue, I will address next.

3. Fundamentals of bank versus capital market dominated economies.

The standard view is that banks and markets compete, so that growth in one is at the expense of the other (e.g. Allen and Gale (1995, 1997), and Boot and Thakor (1997a,b)). In this context Deidda and Fattouh (2008) show theoretically that both bank and stock market development have a positive effect on growth, but the growth impact of bank development is lower when there is a higher level of stock market development. What this shows is that dynamics of the interaction between banks and markets can have *real* effects. How banks and markets interact is therefore of great interest.

There is evidence that banks and financial markets not just compete, but also are complementary. For example, the close monitoring role of banks might facilitate timely intervention. This feature of bank lending is valuable to the firm's bondholders as well. They might find it optimal to efficiently delegate the timely intervention task to the bank.⁶

Another manifestation of potential complementarities between bank lending and capital market activities is the increasing importance of securitization. Securitization is an example of unbundling of financial services and a more recent example of financial development. It is a

⁶ To play this role well, banks may need senior status. Seniority makes them willing to act tougher. To see this, observe first that the unsecured other debtholders need to be compensated for their subordinated status. This is directly related to the work on bargaining power and seniority, see the work of Gorton and Kahn (1993) and Berglof and Von Thadden (1994). The complementarity between bank lending and capital market funding is further highlighted in Diamond (1991), Hoshi, Kashyap and Scharfstein (1993) and Chemmanur and Fulghieri (1994). See Petersen and Rajan (1994) and Houston and James (1996) for empirical evidence, and Boot and Thakor (2010) and Freixas and Rochet (2008) for recent overviews.

process whereby assets are removed from a bank's balance sheet, so a bank no longer permanently funds assets when they are securitized; instead, the investors buying asset-backed securities provide the funding. Asset-backed securities rather than deposits thus end up funding dedicated pools of bank-originated assets. Securitization decomposes the lending function such that banks no longer fully fund the assets, but continue to be involved in other primal lending activities, e.g. monitoring and servicing the borrowers. A potential benefit of securitization is better risk sharing. The proliferation of securitization may however also be induced by regulatory arbitrage, e.g. as vehicle to mitigate capital regulation, see later.

Central to the extensive academic work on securitization is the idea that it is *not* efficient for originators to completely offload the risks in the originated assets. The originating bank needs to maintain an economic interest in the assets to alleviate moral hazard concerns and induce sufficient effort on the originating bank's part in screening and monitoring. What this implies is that even with securitization, banks should not become disengaged from the assets they originate. Banks still continue to provide the services involved in screening and monitoring borrowers, designing and pricing financial claims, and providing risk management and loan servicing support. As such, securitization preserves those functions that are at the core of the *raison d'être* for banks. This militates against the notion that securitization effectively lessens the importance of banks.

As the sub-prime crisis of 2007 has shown, this development was not without problems. The structure of real world securitization transactions appeared to have taken a rather fragile form. In particular, it is important to note that much of the securitization leading up to the crisis involved the financing of long-term assets with short term funding, which induced substantial liquidity risk; e.g. as in asset-backed commercial paper – ABCP conduits. While this liquidity risk was sometimes mitigated by liquidity guarantees (e.g. stand-by letters of credit and other refinancing commitments), the underwriting institutions often underestimated the risks involved and overstretched themselves.⁷

Recent events clearly point at the sub optimality of such strategies. Originating institutions behaved as if they retained minimal residual risk. As a consequence, monitoring incentives may

⁷ Most noteworthy are the bankruptcies among German Lander banks that were involved in providing liquidity guarantees. Risks were further elevated by enormous leverage in the securitization process.

have been compromised (see Mian and Sufi, 2007).⁸ The eagerness of banks to securitize claims – and keep the “repackaging machine” rolling – may have also adversely impacted the quality of loans that were originated through a dilution of banks’ screening incentives due to lower retained residual risks (e.g. sub-prime lending). Credit rating agencies have played an important role in this process as well. Their willingness to provide favorable ratings clearly helped in growing this market, see Box 1.

Box 1: Gatekeepers, de role of credit rating agencies

A positive view of credit rating agencies is that they play a similar certification role (in the financial market) as banks do with bank loans.⁹ As rating agencies become more sophisticated and reliable, the certification role of banks diminishes in importance, causing bank borrowers to migrate to the capital market. In this sense, rating agencies intensify the competition between banks and markets. But they also pull banks into the capital market. For example, banks originate loans that they securitize, and then seek ratings for the securitized pools from rating agencies. The ratings, in turn, facilitate the ability of banks to sell (securitized) asset-backed securities in the capital market. Rating agencies then play a role as gatekeeper (Coffee, 2002).

This rather positive interpretation of rating agencies, and does by the way not really address the question about stability. Rating agencies are clouded somewhat by recent negative publicity. In the 2001 crisis surrounding Enron, rating agencies were accused of being strategically sluggish in downgrading. More recently, they have been blamed (in part) for the sub-prime crisis in which they were allegedly too lenient in rating the senior tranches in securitization transactions. Allegations have been made about conflicts of interest for rating agencies arising from the fact that structured finance is (was) a source of ever-increasing income for them, which then corrupts their incentives for accurately rating the issuers involved in structured finance (Cantor, 2004; Partnoy, 1999). In this context, Coffee and Sale (2008) point at the naiveté to think that reputation building incentives alone would keep credit rating agencies in check.

Of particular concern are the so-called “rating triggers.” For example, some debt contracts may dictate accelerated debt repayments when the rating falls. The consequences of such accelerated debt repayments might, however, be so severe as to cause rating agencies to become reluctant to lower the ratings of those borrowers in a timely manner. Complications also arise from the role played by the so-called “monoliners.” These are insurers who traditionally guaranteed municipal bonds but now also guarantee the lowest-risk (best) tranches in securitization transactions. These insurers became virtually indispensable in the sense that the viability of many forms of securitization was predicated on this type of “reinsurance.” However, the ability of the monoliners to issue credible guarantees (and

⁸ Securitization is facilitated in part by credit enhancement, including partial guarantees by the arranger of a securitization transaction (and/or he holds on to the most risky layer of the transaction). In the recent credit crisis, this disciplining mechanism broke down; residual risk with the arranger appeared minimal, and were often framed as liquidity guarantees to off-balance sheet vehicles without appropriately realizing the inherent risks. That is, banks, while they might have believed that risk was off-loaded, often had been underwriting the liquidity risk in securitization transactions by, for example, guaranteeing the refinancing of commercial paper in ABCP transactions via standby letters of credit. Such guarantees have generated profits for banks, but also created risks, as illustrated by the losses incurred by banks in the recent sub-prime crisis. The marketability of securitized claims has also been facilitated by accreditation by credit rating agencies (see Boot, Milbourn and Schmeits (2006)). The role of rating agencies has been called into question with the 2007-2009 subprime lending crisis.

⁹ Datta, Iskandar-Datta and Patel (1999) show that the monitoring associated with bank loans *facilitates* borrowers’ access to the public debt market. This certification role of banks therefore complements what rating agencies do.

hence their role in securitization) depends on these institutions themselves having AAA ratings. This potentially generates an indirect chain-reaction mechanism for rating agencies. In rating (and monitoring) the monoliners, rating agencies affect the viability of the securitization market. Thus, the impact of rating agencies is both direct (rating securitization tranches) and indirect (rating the monoliners). The potential failure of such monoliners has (had) a significant effect on the value of various structured finance products and induces an additional chain reaction among players active in the structured finance market, including investors. This further underscores the increasing interlinkages in the financial markets. Rating agencies appear to have provided little stability, and might even have elevated instability.¹⁰

The 2007-2009 financial crisis brought securitization almost to a grinding halt. However, the risk-diversification that securitization can accomplish appears to be of more than just ephemeral importance. Thus, I expect securitization to reemerge, albeit possibly in a form that entails lower levels of liquidity risk, as well as lesser moral hazard in screening (loan underwriting standards) and monitoring. A caveat is that some of the activity in securitization may have been induced merely by capital arbitrage, in which case its social value may be rather limited; the new Basel II capital requirements – and particularly the so-called Basel III amendments – may diminish such regulatory arbitrage.

Another effect of the interaction between banks and markets is that as markets evolve and entice bank borrowers away, banks have an incentive to create new products and services that combine services provided by markets with those provided by banks. This allows banks to “follow their customers” to the market rather than losing them. There are numerous examples. For instance, when a borrower goes to the market to issue commercial paper, its bank can provide a back-up line of credit in order to guarantee refinancing. Securitization of various sorts is another example in that banks not only originate the loans that are pooled and securitized, but they also buy various securitized tranches as investment securities. The impetus for such market-based activities grows stronger as interbank competition puts pressure on profit margins from traditional banking products and the capital market provides access to greater liquidity and lower cost of capital for the bank’s traditional borrowers. As a consequence, there is a natural propensity for banks to become increasingly *integrated* with markets, and a sort of unprecedented “co-dependence” emerges that makes banking and capital market risks become

¹⁰ Other concerns are related to the oligopolistic nature of the industry, and the importance that ratings have due to regulation. The latter includes the exclusivity given to a few rating agencies via the “Nationally Recognized Statistical Rating Organization” (NRSRO) classification, somewhat weakened in the 2006 Credit Rating Agency Reform Act, but also the inclusion of external ratings in the new Basle II capital regulation framework. See also U.S. Senate (2002).

increasingly intertwined. This could make banks more willing to engage in lending and hence improve access to financing, but also points at potentially a higher level of instability. One conclusion that I will draw is that this improves access to finance under ‘normal’ circumstances, yet makes access more volatile and subject to the boom-and-bust nature of financial markets. This comes back in the next section.

4. *Understanding the pros of financial innovation*

The notion that financial innovation is good for economic growth is based on the idea that such innovations will improve the allocation of capital. In the words of Fed Chairman Ben Bernanke, “The increasing sophistication and depth of financial markets promote economic growth by allocating capital where it can be most productive” (Bernanke, 2007). This sounds politically correct, and by its very generality difficult to refute. However, more specificity is needed. What can precisely be good about financial innovations? In a first best world where information is available to everybody, and everybody is capable of fully discerning all relevant attributes, financial innovations could help complete the market, i.e., facilitate a complete set of Arrow-Debreu securities. This is the typical ‘spanning’ argument; financial innovations are good because they help complete the market.¹¹

As a more or less immediate corollary, financial development (and financial innovations) might help improve the allocation of capital. In more simple terms, a complete market allows individuals to optimally hedge, or smooth, their income over time. Given this higher level of predictability that results, they can abscond of their money for longer periods of time facilitating more long-term investments.

Similarly, the tradability of debt and equity in financial markets allows investors to liquefy their holdings at any point in time (i.e. by selling their holdings to other investors) and helps in diversifying risks. Also this helps firms in obtaining long(er) term financing. This also helps explain the introduction of limited liability in equity-type contracts. This facilitates trading, and in doing so allows investors to liquefy claims on otherwise long-term investments

¹¹ A complete market means that investors or consumers can ‘contract’ on any conceivable future state of the world, and in doing so create an optimal allocation. In the context of hedging for example such complete market allows investors to neutralize whatever state-contingent risk they may face. What this means is that investors can tailor the state-dependent pay-offs to their precise preferences. Please note that one cannot automatically assume that introducing new securities in incomplete markets that give investors greater ‘spanning’ opportunities is by definition value enhancing. Elul (1995) shows that adding a new security has “almost arbitrary effects on agent’s utilities”.

(Michalopoulos, Laeven and Levine, 2009). Liquidity therefore is valuable, yet, as we will see, can simultaneously have some negative repercussions. More specifically, in a world with imperfections, agency and information problems lead to potential distortions that can show a dark side of liquidity.

Financial innovations also valuable for other reasons...

New securities are sometimes introduced to help overcome information asymmetries. For example, in the costly-state-verification literature it is shown that firms may have access to loans because these can be provided at relatively low cost. The idea is that an equity type claim would suffer from a lemon problem: outsiders would not be able to assess the value and hence refuse to provide funding since the firm could try to exploit a too optimistic view among potential investors about the firm. As put forward in Akerlof's (1970) famous paper, investors would be naive to buy a firm's equity at an average price because only the below average firms would happily be willing to sell the equity at that price. Investors thus face a problem of adverse selection and the market may break down.

Note that things might not be that bad if there is a very low cost in verifying the true state of nature which would help enforce the ensuing obligations. That is, if the lemon problem can be easily overcome by verifying the true state at relatively low cost equity financing might be available. However if the verification cost is high this may not work. A debt claim may now help since with debt (contrary to equity) verification is not always needed. That is, if debt is repaid (interest plus principal) there is no need to verify. If it is not repaid (or only in part) one needs to verify whether there is indeed a lack of resources. Having a debt contract in conjunction with a third party (bankruptcy court?) that can impose a stiff penalty on the firm if it falsely claims insufficiency of funds solves the misrepresentation problem. Unless the debt is issued by a very risky firm the anticipated costs of verification are limited since in most cases the firm can and will repay (and no verification is needed). Note that in the case of external equity there is no fixed payment and verification is always needed. The upshot of this is that a debt security can be seen as a value enhancing innovation to help facilitate access to funding (see the earlier contribution of Gale and Hellwig, 1984; and also Tirole, 2006).

The literature on financial innovation – also referred to as the security design literature – has come up with various approaches to mitigate problems of information asymmetry. One that also rationalizes debt as a valuable security is Boot and Thakor (1993). They show that if

information production costs are not excessive, introducing debt in the capital structure of firms could encourage information production in equity financial markets. This would then via trading in the financial market get prices closer to the underlying true value. The idea is with debt in a firm's capital structure, the equity becomes riskier, but importantly more information sensitive. Hence, the value of producing information about the firm goes up, more information is produced as a result, and prices are pushed towards their real value (see also Fulghieri and Lukin, 2001). All this would be good for resource allocation because mispricing is mitigated.¹²

Others have argued that a rights issue – again a financial innovation – could help solve the lemon problem. With a rights issue existing shareholders get the right to buy the newly issued shares. In essence, if only existing shareholders buy the new shares that a firm wants to issue, the pricing is not that important. Why? Observe that when shares are issued at a price that is too low, new shareholders get a windfall gain at the expense of existing shareholders. With a rights issue (in principle) the new shares go pro rata to the existing shareholders; gains and losses are now in one and the same hand, i.e. internalized by the same group of investors. A rights issue may therefore allow the firm to raise new equity while a 'normal' equity issue would have been infeasible because of a lemon problem. This is important because it highlights that existing shareholders may continue to provide financing. In a different context this is also what happens with venture capital financed firms; this typically involves a small group of investors.¹³

The security design literature provides several other examples of financial innovations that could resolve particular agency- and asymmetric information problems. For example, convertible bonds could give bondholders protection against risk-seeking behavior by shareholders. The idea is that in a situation where a lot of debt already exists, new debt financing might not be available because it might induce shareholders to favor excessive risk. That is, their leveraged claim gives them an enormous upside potential if risks work out,

¹² Hennessy (2009) shows that firms may issue securities that are less information sensitive if the Akerlof (1970) lemon problem is very severe. In that case, risk and information problems are overwhelming and trying to carve out a relatively safe claim might be the only hope for obtaining external finance.

¹³ Note that this may not work in the presence of (too much) debt. With, what is called, debt overhang new equity even from existing shareholders may not be forthcoming because it would give debtholders a windfall gain. This is the case particularly when the coupon on existing debt is fixed. It is also quite prevalent in banking where a government guarantee effectively makes debt available at low cost, while the guarantee is not priced. This induces risk taking behavior and could make banks averse to raising new equity because it would benefit the government (i.e. lower the value of the guarantee).

while the down side is born by the debtholders. With convertible debt, debtholders will share in the upside if risks work out (i.e. conversion will then occur). This will make matters somewhat more balanced because shareholders no longer exclusively get the upside which discourages risk taking. Thus equity-like financing might possibly be available.

In all these theories financial innovation is something good; it tries to mitigate or resolve a particular friction and (ultimately) benefits the underlying real activity. Other motivations for introducing financial innovations include regulatory arbitrage and minimizing transaction costs. Whether this is good or bad depends on the particular context. For example, innovations designed to bypass regulations (regulatory arbitrage) could be good if one considers those regulations not desirable. But assuming that the regulation involved has merit, say capital requirements imposed on banks, innovations that are only aimed at bypassing them should probably be viewed negatively. Reducing transaction costs as rationale for financial innovations can often be viewed more positively. If certain frictions – transaction costs – impede the optimal allocation of capital then innovations that reduce these seem optimal.¹⁴ In this positive interpretation, innovations like credit default swaps (CDS) and collateralized debt obligations (CDO) would promote an optimal allocation of capital by reducing the cost of diversifying and reallocating risk. However, as Posen and Hinterschweiger (2009) note during the period 2003-2008 the growth in OTC derivatives outpaced that of real investment by a factor of twelve (300 versus 25 percent). And after 2006 real investments stagnated while OTC derivatives grew arguably faster than ever. While this does not preclude that the proliferation of these financial instruments provided benefits also later in the boom, the negative effects on the robustness of the financial system – as observed in 2007-2009 – tend to refute this.

I now turn to the dark side of financial innovation.

5. Innovations might be problematic...

Johnson and Kwak (2009) state that a financial innovation is only good if it “enables an economically productive use of money that would not otherwise occur”. This statement makes it clear that financial innovations do not necessarily add value. This might particularly be the case when information asymmetries are present.

¹⁴ Tufano (2002) summarizes other motivations for introducing financial innovations along these lines.

When information asymmetries are present and particular contingencies are not contractible, having complete markets is infeasible.. This happens when contingencies are not verifiable, and/or too costly to verify. Introducing a financial innovation might now have a much darker motivation. For example, introducing financial innovations might be intended to fool market participants. An example might be the Dutch or UK market for life insurance products. On several occasions structural misspelling has occurred with as common denominator: the presence of an excessive variety of product innovations that share one characteristic: complexity in conjunction with obscurity of costs relative to potential benefits.¹⁵

Financial innovations would then tend to worsen the allocation of capital. The more recent advances in securitization could be interpreted that way too. Initially securitization could have allowed for a wider access to investors, reduced funding costs and hence improved lending opportunities for banks. As stated earlier, this may well have been value enhancing. There is a logic in fulfilling the demand for high investment grade securities by packaging mortgages, and selling the low risk portion to (distant) investors. As long as the originators of the loans keep the more risky layer, they would still have a strong incentive to screen loan applicants and monitor them. What happened subsequently is less benign. It is clear that lending standards weakened. In part this had little to do with securitization. The housing boom in the US seduced lenders in granting higher mortgages. As long as prices kept rising, loans could always be refinanced and/or sales of underlying houses would cover the outstanding mortgages. Where securitization did come into the picture is that the insatiable appetite for AAA paper in the market pushed financial institutions into a high gear repackaging mode, ultimately lowering standards even further. Also, in a desire to issue as much AAA paper as possible, the more risky tranches of securitization structures were repackaged again, and more AAA paper was squeezed out. All this packaging and repackaging led to very complicated securities. When the market finally started questioning the sustainability of the housing boom, the arcane securities were suddenly out of favor.

Financial innovations often cause harm by reducing transparency, and this might be deliberate. The earlier example about life insurance – as stated – might be a good example

¹⁵ Gabaix and Laibson (2006) analyze how producers (e.g. financial services firms) can exploit uninformed consumers by misrepresenting attributes. In Carlin (2009) complexity is added to discourage information production, intended to facilitate expropriation of investors.

about that. While securitization did create arcane products (the sequentially repacked claims), the objective of securitization might not have been to create this lack of transparency. The arcane nature of the end product might have been a side effect of the sequential repackaging that was driven to ‘squeeze out’ as much triple-A paper as possible. In practice this may still have had the same effect: some market participants got fooled in trusting the quality of this highly rated paper (and the willingness of rating agencies to grant such high ratings did help, see also Box 1).

The more fundamental observation – and the one already mentioned in the previous section – is that securitization is a financial innovation that intertwines banks with financial markets. Financial markets are however subject to booms and busts, or better heavily momentum driven. As long as momentum was there, the market’s appetite could not be saturated, and much money could be made by putting the ‘repackaging machines’ in higher and higher gear. The important observation is that recent financial innovations are typically linked to financial markets, and financial markets have this boom and bust nature.

Marketability and excessive ‘changeability’ key...

Securitization has opened up the bank balance sheet. Many bank assets have potentially become marketable. This marketability is typically seen as something positive, but the links with the financial markets that this has created has made banks potentially more vulnerable vis-à-vis the volatility and momentum in financial markets. Moreover, marketability means that existing activities and risks can be changed almost instantaneously. Since financial markets go through cycles and are subjected to hypes, the banks’ decisions might become more momentum driven. This adds further instability.

Elsewhere (Boot, 2009), I frame this ability to change things almost instantaneously as a move to more ‘footloose corporations’. What I mean by this is that corporations (or banks for that matter) due to the proliferation of financial markets and the increased marketability of their operations (creating a transaction orientation) become uprooted, meaning lose a degree of fixity and stability. This discussion is also related to the general corporate governance question on the rights of shareholders and the role of private equity investors in particular. While different opinions exist, typically it is considered important that management has some mandate (i.e. elbow room) vis a vis shareholders. In related work by Boot, Gopalan and Thakor (2008), the emphasis is on the need of having some stable shareholders. The liquidity stock markets provide

may cause ownership to be changing all the time such that no stable and lasting link with shareholders comes about. This could make firms even more sensitive to financial market pressures. In Box 2 I provide a brief summary of the key insights of the Boot (2009) study.¹⁶

Box 2: Footloose corporations: the instability coming from financial markets

The uprooting of firms – footloose corporations – is a reinforcing process. The financial market perspective tends to result in excessive volatility and instability within firms, which damage the social fabric. Companies have accentuated this by giving in to the pressures from those same financial markets. They are tempted to organize themselves in such a way that they become divisible; instead of striving for internal synergies, they have created separate, easily accountable units. And yes, that further erodes the social fabric and so leads to even more transactions, which in turn continue to fuel the process of decomposition. And so a kind of vicious circle forms.

At the same time, such a process can be seen affecting the behavior of both senior management and employees. As soon as the CEO lets his position be dictated by the fickleness of the financial markets, he becomes like a (temporary) mercenary of the financial market. He either has momentum or he does not. It is all or nothing, with the concomitant increase in the turnover of senior executives. This results in the boardroom’s effective alienation from the rest of the organization, undoubtedly accompanied by numerous transactions, and again it is the social fabric of the organization which suffers. All those transactions, plus the alienation – whether real or only perceived – of those supposed to be running the company, encourages the rest of the workforce to give in to calculating self-interest. “What’s in it for me?,” they ask themselves. Their ties to the organization more or less collapse to solely their financial remuneration contract. Self-serving behavior then becomes the norm. For instance, they start to overly invest in developing marketable skills – those of use to any employer – rather than abilities specific to the company itself. And so another vicious circle is created.

The key challenge facing businesses is to recognize these self-reinforcing processes and to counter those effectively. Leadership requires vision, and it is essential that management creates elbow room to maneuver. A mandate is key. The reality is that management can claim this mandate. For shareholders, notwithstanding everything that has been said, it is very difficult to intervene. It is management’s own fixation with highly visible share prices and with the circus of analysts and consultants which underlies its capitulation to the financial markets.

From: Boot (2009).

More on the dark side of marketability

Creating liquidity and opening up markets, i.e, trading possibilities, is typically seen as something positive. But this is not always the case as follows from the previous section. One application is the context first investigated by Amar Bhide (1993). His insight was that the liquidity of stock markets is typically considered a virtue, yet may have a dark side in that fully liquid stock markets encourage diffuse ownership, and this may undermine monitoring incentives. Hence corporate control over managers might be lax inducing inefficiencies. In other words, monitoring incentives typically require a larger and enduring stake in a company,

¹⁶ The dark side of liquidity and possibility for quick changes in asset allocation is related to the work of Myers and Rajan (1998) who emphasize that the illiquidity of bank assets serves a useful purpose in that it reduces asset substitution moral hazard.

yet this is at odds with liquidity. This suggests a trade-off between liquidity and a more enduring presence by committing not to sell. In subsequent research Bolton and Von Thadden (1998) have shown that stock market liquidity may benefit from the simultaneous presence of a few block holders. That is, having some proportion of shares freely traded but not all, may help create liquidity in the freely traded shares in part because the market knows that some investors have a more sizable and permanent (minority) stake that gives them an incentive to monitor. In this way some agency problems at the level of the firm might be mitigated. This is in line with the earlier discussed work of Boot, Gopalan and Thakor (2008) who focus on the pros and cons of (lack of) stability in the shareholder base particularly in the context of exchange listed firms.

The costs of liquidity and/or marketability can be further emphasized in the context of financial sector stability. This can be linked to securitization (see earlier), but also to the stability of investment banks vs commercial (relationship oriented) banks. Traditional relationship oriented banks seem incentivized to build up *institutional* franchise value. Individuals are part of the organization as an entity, and not readily identifiable as individual stars. In other words, the value created is fixed to the organizational entity and not portable as part of individuals.

Investment bank on the other hand, seems more based on the individual star concept with high marketability of individuals. As a consequence, less institutional franchise value is build up; individual franchise values dominate. If this the only difference then the relationship banking institution has implied value, while the investment bank has little implied value, and hence Keeley (1990) analysis would suggest that an investment bank would take lot of risk, while the franchise value of a commercial bank would help curtail its risk taking.

Historically investment banks have solved this marketability problem (and potential lack of institutional franchise value) by having partnerships. The partnership structure has two dimensions that jointly resolve the risk taking problem and marketability (and star phenomenon):

- a partnership means that bankers have their personal wealth tied up in the business – they own the equity claim themselves.
- Simultaneously, the partnership structure means that the equity is not (optimally) marketable.

The latter implies that ‘stars’ cannot take their money out, or only at a reduced value. Implicitly, this also means typically that franchise value is created this way, and this value is transferred over time (to future partners). Interesting examples exist where institutions have made changes that have destroyed this structure. For example, in an initial public offering (converting a partnership in a listed shareholder owned company) the current partners effectively expropriate all franchise value that has been build up over time. Even worse, once the partnership is gone, stars are no longer ‘under control’. Their financial interest is no longer tied to the firm. This elevates risk and reduces stability.

One way of interpreting the developments in banking is that even in commercial banking more of the business has become marketable, and the ‘star’ phenomenon may also come up there. In any case partnerships among major financial institutions are no longer common. Changes, whether in the form of financial innovations (products), processes (securitization) or institutional changes (the demise of a partnership in lieu of an exchange listing with marketable equity) all work in the same direction. They make things footloose and in doing so could undermine stability. These links between marketability and financial sector stability (and the real economy) are important in the context of evaluating financial development and financial innovations.¹⁷

6. Putting it together: what to conclude?

What has been shown is that financial innovations can be good from the perspective of completing markets, as well as from a perspective that focuses on overcoming asymmetric information and agency problems. Nevertheless, a much more negative picture can be drawn. Innovations might be designed to fool market participants, and in doing so cause serious harm (see Henderson and Pearson, 2009). The instability that they might cause is arguable even more worrisome. This red flag is related to the earlier observation that financial innovations often make things (e.g. banks!) intertwined with financial markets, and that those financial markets are subject to booms and busts, or better heavily momentum driven. The question

¹⁷ Another important link is to the work in economics that emphasizes that creating markets and trading opportunities might not necessarily be good. It could for example create time-inconsistency problems and complicate the feasibility of otherwise (ex ante) optimal commitments. In this context, the work of Jacklin (1987) is noteworthy. He showed that introducing trading opportunities at the intermediate point in time could destroy the liquidity insurance feature of demand deposit contracts in the Daimond-Dybvig (1983) framework.

then is when do financial innovations destabilize things, as securitization might have done to banks.

It is very difficult to come up with conditions that help us distinguish between value enhancing and value destroying innovations. My discussion on the value of partnerships points at the need for some ‘fixed points’, not everything can be fluid. Marketability definitely has a dark side; it potentially causes severe instability.¹⁸

When we take a bigger picture and focus on innovation in the financial sector not just in the product sense but also in processes and institutional structure more can be said. Recall that the type of innovations encompass products (financial innovations in the strict sense), processes (securitization) and institutional changes (e.g. the demise of a partnership in lieu of an exchange listing with marketable equity). The institutional structure at the most aggregate level was discussed in section 3 where bank-dominated versus capital market dominated economies were discussed. As I emphasized, financial innovations in the product sense are often linked to financial markets, and effectively bring bank-dominated intermediation closer to the financial market.

What has not been discussed is that bank-based systems versus market-driven systems might also deviate in terms of their openness to real innovations. There is a body of work (e.g. Rajan and Zingales, 2001; Boot and Thakor, 1997a) that argues that being bank-based gives too much power to existing institutions and businesses at the expense of new activities and initiatives. This could retard real innovation and renewal.¹⁹ A bank-based system is more conservative, particularly more incumbent oriented, and hence less able to take advantage of new opportunities. This suggests a trade-off between a more volatile market-based system and a less innovative, yet possibly more stable banking system.

In work by Allen (1993), Carlin and Mayer (2002), and more recently Herrera and Minetti (2007), the message is that truly path breaking innovations are better facilitated in financial market dominated economies (like the US), while bank-dominated economies could possibly be better in accommodating more gradual innovations. In Allen (1993) this is linked to the information aggregation role of financial markets that might be crucial for assessing unknown

¹⁸ Other thoughts on instability and financial innovation are provided in Shiller (2008), Loayza and Ranciere (2005) and Brunnermeier et al. (2009). See also Frame and White (2002) on the difficulty of evaluating the added value of financial innovations.

¹⁹ See also Bekaert, Harvey and Lundblad (2005), and Levine and Zervos (1998).

path breaking innovations. In Herrera and Minetti (2007), the arguments are more linked to the reasoning in Rajan and Zingales (2001) in that a bank may want to obstruct path breaking innovations that may render its information about the firm obsolete (i.e. the bank may seek to preserve its hold-up power over the borrower). Carlin and Mayer's (2002) empirical results seem to support these observations.²⁰

Following the overview of findings in my 2007 study for the OECD (Boot, 2007) focusing on The Netherlands, a bank-dominated nature of the financial sector would then translate into difficulty of financing more radical innovations. Given the information induced switching costs (hold-up problems), SME firms may face constraints on availability of financing, and this would particularly show in those cases where collateral is not readily available. Again this would be in more innovative firms. The focus on incumbents that a highly concentrated bank-dominated system can induce would be most apparent with (newer) high growth firms and SME's.

The level of product (e.g. CDS) and process financial innovation (securitization) observed in the recent past have definitely affected the institutional landscape. The long-term implications for the structure of the banking industry are not yet clear. More concentration is definitely a possibility. Whether the financial sector becomes more or less bank-dominated is not clear either. What the new equilibrium looks like and what the implications are for potential financing frictions are (e.g. the ones mentioned just above) is therefore an open issue.

I have emphasized potential complementarities between banks and financial markets. On the positive side one could say that financial innovations have possibly strengthened these complementarities. One could however easily draw a more negative conclusion. In the 2007-09 financial crisis European banks have arguably been hit most. One interpretation is that the European financial sector started combining the worst of both worlds: it continued to be bank-driven with its negative effects on renewal and entrepreneurship, yet these very same banks became intertwined with financial markets and as a consequence volatility increased and the benefits of stability disappeared.

²⁰ Van Tilburg (2009) includes further references and observations.

This is clearly linked to the observation that financial innovations are to some extent opportunistic. They are part of a more open financial system. This gives potentially more instability but also allows for more immediate possibilities to take advantage of opportunities. What comes out of this paper is that we need to (learn to) deal with the instability that marketability brings. The proliferation of marketability clearly has a dark side. Particularly the continental European bank-dominated financial sectors need to find a new equilibrium in this fluid world.

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