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Financial Structure, Economic Growth and Development

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Abstract

Financial intermediaries and markets can alleviate market frictions through producing information and risk sharing in different ways. In practice, the structure of financial systems can be bank-based or market-based, varying across countries. The influence of financial structure on economic growth is dependent on the overall development of the real economy and institutions. The association is also different during crisis periods and non-crisis periods. Market-based systems tend to have an advantage for financially dependent industries in good times but are a disadvantage in bad times. The recent rapid growth of shadow banking benefits economic growth but also poses additional risks to the financial system and real economy.

Key words: Banks, Markets, Shadow banking, Economic Growth

1. Introduction

The relative advantages and disadvantages of different structures of the financial system for economic growth have been a long-debated issue in economics. On the one hand, Hamilton (1781) argued that “banks are the happiest engines that ever were invented” for spurring economic growth. Gerschenkron (1962) underlined the crucial role of universal banks in German industrialization between the middle and end of the nineteenth century. Similarly, Calomiris (1995) compared the American and German systems of investment between 1870 and 1914 and argued that the German system was superior. Moreover, Kennedy (1987) claimed that the failure of British financial

intermediaries to behave as German universal banks did hamper British economic performance in the late nineteenth and early twentieth centuries. On the other hand, Bagehot (1873) and Hicks (1969) claimed that financial markets played an important role in the UK's Industrial Revolution.

Our starting point is the observation that different financial systems have evolved in different places through time. As a result, there are differences across countries in the level of financial system development and its structure. The basic functions of the financial system, however, have remained constant through time and across countries. What differs across countries is the quality of the functions provided by the financial system to the economy, which indicates its level of development. In the following section, we will discuss the main functions of the financial system and emphasize the differences in the quality of services provided by banks and markets to the economy. The importance of banks and markets in fulfilling their functions indicates their structures, which are defined as the mix of financial markets, institutions, instruments, and contracts that prescribe how financial activities are organized at a particular date (Levine 1997, 2005). To evaluate whether one system has performed better than another over time, it is important to understand how the financial systems are structured, and the determinants as well.

In the literature, the classification of the financial system typically follows a binary approach (Fohlin, 2012). It often focuses on the dependence of savers and firms on banks or capital markets and draws a distinction between countries with market- and

bank-oriented systems. Bank-oriented systems are those displaying high levels of bank finance, equity holding by banks, long-term relationships, close monitoring and active corporate governance by banks. Typically, bank-based financial systems correspond to countries in which commercial banks are mainly universal. In contrast, market-oriented financial systems support large, active securities markets, and firms use market-based financing. In market-based financial systems, banks are very often specialized with an important group being investment banks. This oversimplified characterization provides only a partial picture of the financial system, so some authors classify the financial system as relationship-based or arms-length systems, which captures the degree of separation between investor and firm (Rajan and Zingales, 2002).

In theory, every country has one type of financial system, which falls into one of the distinct categories. In practice, however, the distinction between bank- and market-oriented systems or arms-length and relationship-based financial systems is difficult. The rapid changes in the financial industry in recent decades have further complicated the distinction. In reality, there is no clear-cut distinction between financial systems, and the classifications fit only in a rough manner empirically.

Figure 1 shows a comparison of the development of the domestic banking sector versus equity markets between the years 1975 and 2014 by comparing the five-year averages 1975-79 and 2010-14 for the UK, the US, Germany and Japan. It shows that during those years, the structure of the financial systems in these countries has changed significantly. The banking sector has been growing very fast in the UK, while

the market has been rising in Germany and Japan, although Germany and Japan remain predominantly bank-based. It can also be seen that the financial sector had been growing faster compared to the real economy in developed countries in the last two decades. Goldsmith (1969), McKinnon (1973) and Shaw (1973) found a strong relationship between the financial development of a country and its subsequent economic growth. Although subject to ample qualifications and countervailing views, the preponderance of evidence suggests that both banks and markets matter for economic growth (Levine, 2003). However, in a recent study, Cecchetti and Kharroubi (2015) present evidence that there is a negative relationship between productivity and financial sector growth. Moreover, they report that the causality is likely to run from financial sector growth to real economic growth. These two findings suggest improving the level of financial system development may be good only up to a point, after which it becomes a drag on real economic growth.

Since the 1990s, the financial systems in developed countries have undergone profound changes. The importance of traditional banking intermediation from deposits to loans has declined, whereas capital markets have developed considerably through many new financial innovations (Hartmann et al., 2003). Consequently, a large number of authors expected a convergence of the structure of the financial system in developed countries (Rajan and Zingales, 2002). Figure 1, however, shows that while this has occurred to some degree, it has not been uniform. There has been some shift from a bank-based to a market-based financial system in Germany and Japan, and in the US,

the system has become more market-based, but in the UK, the reverse is true. Care must be placed in interpreting the UK figures, however, because it has grown as an international financial centre for banks during this time.

Why the differences in the structure of the financial system have prevailed across countries is not well understood. A substantial body of literature tries to explain the differences across countries from different perspectives, including law, politics, and culture. In addition, a number of papers have argued there is a positive nexus between financial system development and economic growth. In recent decades, there has been a rapid growth in financial innovations, such as securitization, which increases the reliance of banks on capital markets as a source of finance. This trend not only leads to the growth of financial intermediation outside the banking system but also has important implications for the role of banks in financial markets. Consequently, the structure of the financial system is now more complex than it used to be. These changes may benefit the general economy by increasing credit availability and reducing the cost of capital, while at the same time, they may make the financial system more fragile and further amplify economic volatility, as mentioned in the financial crisis of 2007.

Against this background, this chapter explores the comparative roles of banks and markets in the financial system for economic growth as well as the recent growth of non-bank financial intermediaries (or shadow banking), the causes and consequences of crises, and other potential factors, including law and politics behind the financial structure and economic development nexus.

Financial intermediaries and markets depend critically on contractual institutions. Therefore, this review is closely related to several recent surveys on law and finance. Beck (2013) offers a literature review on the role of financial deepening in economic development through the lens of the role of government and regulation. He distinguishes between the policy view that relates financial development to an array of policies and institutions, the historical view that relates financial development to historical and cultural factors, and the political view that explains the financial development using political conflicts and decisions. Beck and Levine (2003) provide a selective review of research on the role of legal institutions in financial development, while Beck (2010) surveys a large historical and empirical literature on legal institutions explaining cross-country variation in economic development.

The remainder of this chapter is organized as follows. In the next section, we present the literature on the function of the financial system, whereas we will focus on the role of banks and markets in the economy. In Section 3, we discuss both the theoretical and empirical literature on financial structure, growth and crises, and the recent growing literature on shadow banking as well. Section 4 reviews the literature that tries to establish factors determining the structure of the financial system. Section 6 concludes.

2. The Role of the Financial System

A well-functioning financial system allows the allocation of resources within time and space, which has several positive effects on real economic development. There exists an extensive literature on this topic that has been summarized by Levine (1997). According to Levine (1997) financial markets and intermediaries can influence economic growth in five different ways. Firstly, more savings will be mobilised. Secondly, a better supply of information will lead to a better allocation of resources. Thirdly, there will be better opportunities for monitoring managers. Fourthly, it will become easier to trade, hedge, diversify and combine risks. Fifthly, transactions concerning goods and services will be facilitated. Although both financial markets and intermediaries can fulfil all these functions of the financial system, there are significant differences how they perform in practice. These differences exist especially in solving the information problem and risk sharing.

2.1 Producing information and monitoring

An argument that is often put forward in favor of bank-based systems is that financial intermediaries are, in principle at least, better able to acquire and process information about the activities of borrowers. One important problem is that borrowers may use funds in ways that are not always in the interest of lenders. As the acquisition of information is costly, the individual savers (lenders) may not have the ability to collect information on the possible investments of the borrowers. Therefore, at least hypothetically, bank-based systems have a number of advantages in terms of acquisition of information about borrowers. Banks often have a long-term relationship

with their borrowers, which should result in repeated interactions. Consequently, a bank might have better access to borrower-specific information that allows better screening, monitoring of loans, as well as enforcement of repayment of obligations, particularly in countries with weak contract-enforcement possibilities. The relationship between the bank and the borrower is often regarded as an advantage of bank-based systems that allows banks to recoup the advantage of economies of scale.

Diamond (1984) develops a model of delegated monitoring and shows that they are committed to monitor borrowers by promising the lenders a fixed return. If the banks do not monitor, they will not be able to pay the promised return to lenders (depositors). Diamond's model explains the incentive to act as a delegated monitor and produce the information necessary for an efficient allocation of resources. As a result, banks may significantly improve the efficiency with which capital is allocated in the economy.

Baliga and Polak (2004) show that one difference between bank-based and market-based systems is the degree to which creditors monitor firms. Using an equilibrium model, they study whether firms borrow using either monitored or non-monitored debt and show that multiple equilibria may exist. In particular, the bank-based equilibrium has large lenders as well as large firms and monitored finance. In contrast, the market-based equilibrium has more, smaller firms with unmonitored and traded debt. They show that the market based system can persist only if it is efficient, while a bank-based equilibrium can be sustained even when it is inefficient.

Consequently, Baliga and Polak (2004) suggest that there is no need for policy intervention to encourage bank finance, yet there may be a need for policies aimed at the development of secondary financial markets.

Russ and Valderrama (2012), however, argue that banks needing to acquire information and monitor borrowers results in higher marginal costs of bank lending. In contrast, in market-based systems bonds are acquired by a dispersed pool of investors who cannot commit to monitor the activities of the issuers. If investors cannot observe the borrower's action unless they pay for monitoring costs, there exists a free-rider problem with many small investors who do not want to bear these costs. As a result, it may be that no one monitors the borrowers. This is commonly referred to as "unmonitored" lending and is a feature of market-based systems.

This problem can be solved through the information producing role of financial intermediaries. As information about investment opportunities is not free, financial intermediaries may find it worthwhile to produce such information. Boyd and Prescott (1986) show, however, that there is an information asymmetry that occurs prior to contracting and investing, resulting in an adverse selection problem. Each agent is endowed with a technology to evaluate projects, that is, the technology can determine agent type. Ex ante information production can alleviate the adverse selection problem. Indeed, Boot and Thakor (1997) also develop a model of financial system architecture and show that there are three types of informational problems. The first is that the information about the future projects that a firm has access to is incomplete, whereas

outside investors can gather information about these possibilities. The second problem is that lenders cannot identify the level of risk of the borrowers' investments. The third problem is the likelihood that borrowers will invest in a risky project. Using a theoretical model Boot and Thakor (1997) show that the first problem can best be solved by financial markets, and the second and third problems can be best solved by financial intermediaries.

Similarly, Allen (1993) argues that banks and financial markets are fundamentally different in the way they process information. Financial markets aggregate from a wide range of disparate sources, whereas banks depend primarily on their own assessments. As a consequence, markets dominate when technologies are new, complex and rapidly evolving, while banks are inherently conservative. Therefore the prediction is that stock market-based economies will embrace new technologies, while bank-based economies will be less dynamic. In a later study, Allen and Gale (1999) show that when people have diversity of opinions and there is genuine disagreement about the optimal decision, financial markets potentially perform better than intermediaries. Essentially they ask the question whether financial markets or banks are better at financing projects that involve new technologies. They find that for projects with new technologies, investors are more likely to have diversified opinions based on the different prior beliefs. Consequently, market-based financial systems are often seen as better in promoting innovation and the investments in new/riskier technologies. In line with this, Chakraborty and Ray (2007) construct a dynamic model,

whereas a firm may borrow using monitored bank loans (bank finance) or non-monitored sources like bonds and equities (market finance) or a combination of the two. They show that financial structure is shaped by investment technology, whereas market-based systems are more conducive to riskier investments.

2.2 Risk sharing

Another important function of a financial system is to achieve optimal allocation of risk. It is often argued that financial markets are well suited to achieve this aim (Allen et al., 2015). Traditional financial theory assumes that the set of assets is given and focuses on efficient risk sharing through exchange at a given point in time (Greewood and Jovanovic, 1990; Devereux and Smith, 1994; King and Levine, 1993). In this setting risks can be traded and more risk-averse people hold less risk than people who are more risk tolerant. In the end each investor holds a relatively small amount of any type of risk. King and Levine (1993) show that this type of cross-sectional risk diversification can stimulate innovative activity and promote investment in growth-enhancing projects for sufficiently risk averse agents because trading risks through markets can induce a portfolio shift toward projects with higher expected returns. Consequently, traditional financial theory essentially argues that financial markets are well suited to achieve cross-sectional risk sharing.

Allen and Gale (1997, 2000) point out that traditional financial theory has little to say about hedging non-diversifiable risks. They show that cross-sectional risk

sharing does not eliminate macroeconomic shocks that affect all assets in a similar way. It is shown that such risk can be averaged over time in a way that reduces their impact on individual welfare through intertemporal smoothing by banks. It requires building up reserves of safe assets when the returns on bank' assets are high and running them down when they are low. In this way banks can reduce the impact of risks over time on depositors' welfare. Allen and Gale (1997, 2000) show that the opportunities for engaging in intertemporal smoothing are very different in market-based and bank-based financial systems. They demonstrate that incomplete financial markets, on the one hand, may not allow effective intertemporal smoothing. The problem is that long-lived assets crowd out the storage technology as it can be bought and sold for the same price and in addition it pays a dividend. Long-lived financial institutions, such as banks, on the other hand, can achieve intertemporal smoothing, as long as they are not subject to substantial competition from financial markets. In fact, competition from financial markets can lead to disintermediation and the unravelling of intertemporal smoothing provided by long-lived institutions. In good times, individuals would rather opt out of the banking system and invest in the market, thus avoiding the accumulation of reserves from which they may not benefit. Therefore, in the long run, intertemporal smoothing by banks is not viable in the presence of direct competition from markets.

Acemoglu and Zilibotti (1997) also consider an environment in which markets are incomplete and show that it is costly to produce assets to diversify risks and furthermore the inability to share risks will introduce a large amount of growth

uncertainty. Because of the disintermediation trend when markets develop, there are few studies in which markets and intermediaries coexist. Fecht, Huang and Martin (2008) develop a way to consider this case. They construct a model based on a Diamond and Dybvig (1983) setup where there is a possibility for households to invest in financial markets directly if they pay a cost. They show that in equilibrium the degree to which banks can offer intertemporal smoothing is constrained by households' access to financial markets. Therefore they argue increased access to financial markets has a negative welfare effect in terms of limiting the efficiency of risk sharing. However, as the lower degree of risk-sharing can bring about a lower investment in liquid funds and correspondingly a higher investment in long-term and highly productive projects, more developed financial markets may have a positive growth effect.

3. The structure of financial systems: bank-based or market-based?

In recent years, many economists have extensively investigated the relationship between finance and growth and found that financial development has a strong, positive impact on economic growth (see Levine 1997, 2000 for a survey of the literature on the finance-growth nexus). In practice, the development and structure of financial systems do vary among countries. In some countries, financial systems are predominantly bank-based, while in others, they are dominated by financial markets. As a result, a number of empirical studies have attempted to examine whether one type of financial system performs better in terms of promoting economic, industry or firm

growth. In addition, the recent rapid growth of non-bank financial institutions (or shadow banking) has benefitted the economy, but it may also pose additional risks. In this section, we will discuss the empirical research on financial structure and economic or industry growth and argue that these studies are not without their own problems.

3.1 Financial system structure

To understand the relationship between the financial system design and economic performance, we need to understand first how actual financial systems are structured across countries. As we will discuss later, financial systems have evolved along different paths in different countries over a very long time. Consequently, there are intrinsic differences in the structure of the financial systems across countries.

The literature typically follows a binary approach in the classification of the structure of financial systems and most often focuses on the relative size of banks and equity markets in countries' economies. Using this classification method, financial systems are defined as either bank-based or market-based. In practice, financial systems combine both bank-based and market-based intermediation, while the existing theories provide conflicting predictions about whether the financial system's different systems are substitutes or complements or whether one is more conducive to growth than the other.

Demirgüç-Kunt and Levine (2004) indicate that banks and securities markets tend to become more developed as economies grow. They find, however, that securities

markets tend to develop more rapidly than banks, and as a result, the financial system becomes more market-based during the process of economic development. Consequently, it was expected that the financial system would converge towards a market-based financial system over time. Nevertheless, Rajan and Zingales (2003) argued that the structure of the financial system might experience large reversals when a political majority decides to change the legal system underlying corporate financing and governance, as occurred, for example, in the United States in the first third of the last century (Roe, 1994). In the United States, the Glass-Steagall Act of 1933 prevented commercial banks from undertaking investment banking services. The restriction on the activities was further extended in 1956, when the Bank Holding Company Act was passed, which in addition, instituted limitations on the purchasing of banks in other states. Those regulations profoundly altered the development of the US financial system.

Indeed, Fohlin (2012) argues that most financial systems are better characterized by specific components of one of the systems rather than focusing on bank versus markets. Using this typology, she classified the financial system in two main types: universal or specialized, depending on the scope of services offered by the commercial banks. In the financial system characterized as universal, banks provide almost all the financial services, in particular investment banking services. In contrast, specialized banking refers to a financial system in which banks are restricted in their activities to one or a small portfolio of services. In the past two decades, before the

financial crisis of 2007-2009, we have observed a deregulation trend in a large majority of countries. Hence, currently most financial systems allow for commercial banks to conduct most of the activities, yet how the banks operate differs significantly across the countries. Following the crisis of 2007-2009, there is, however, a strong trend once again on restricting the services provided by commercial banks as well investment banks.

The long-standing dichotomy in the classification of the financial system has tended to subsume other institutional features that characterize the financial system, such as the size of the corporate bond market or private equity market. Thus, Rajan and Zingales (1998b) prefer to classify the financial system using the relative dependence of the firms on financing. Using this method, they distinguish two polar forms of financial systems - relationship-based and arm's-length. The relationship-based financing guarantees a return to the financier by permitting a form of control over the firm being financed, where the simplest form of power is ownership. The financier is often a bank who is the sole or main lender of the firm. Moreover, the bank may also have a strong relationship with firm suppliers or customers, who will be interconnected through the bank's network.

In arm's-length financing, instead, the financier is mainly or solely protected by explicit contracts. Hence, the financial system needs a strong institutional framework where legal enforcement and transparency is crucial. On the one hand, firms are able to approach a large circle of financiers, as the financing is based only on contracts.

Moreover, the service offered by financiers is often more innovative, as invention is needed to attract borrowers. On the other hand, the relationship-based financial system may provide more security, as banks have a strong link with the firm and may be willing to support it in times of financial distress. The literature, however, indicates that the implicit guarantee from banks results in higher costs of financing for the firm.

Rajan and Zingales (2001) argue that the relationship-based financial system works well in the early stages of industrialization, where the finance industries are physically intensive and the legal systems ineffective. In addition, they outline that the system relies heavily on implicit or explicit government guarantees, which facilitate government intervention, making it both less costly and less transparent. As the economies develop and the industries are becoming more innovative and knowledge intensive, a hybrid financial system is more effective. Consequently, there is then a need to improve transparency and legal efficiency, so the arm's-length market can function effectively.

While relationship-based financing is mainly attributed to banks, there are also other financiers, such as private equity firms, who have strong connections with the firm, yet are mainly found in market-based financial systems. Another important element of the financial system is the corporate bond market. From the corporate finance view, corporate bonds are similar to bank loans in their characteristics. On average, the bond yield is lower than the bank interest rate for even the lowest-risk borrowers, but bond issuance is limited to firms with large sales revenues (Russ and

Valderrama, 2012). The higher marginal cost of bank lending stems from the specialization of banks, which requires significant resources to acquire information and monitor borrowers. In contrast, bonds are acquired by a dispersed pool of investors who cannot or choose not to monitor the activities of the issuers. This, therefore, is commonly also referred to as “unmonitored” lending (Russ and Valderrama, 2012). Thus, corporate bonds have characteristics that allow them to be classified as an element of both the bank-oriented and market-oriented financial systems.

In the literature, most authors classify corporate bonds as part of the securities market. Gu and Kowalewski (2016) find that development of the corporate bond market depends strongly on the level of the creditor rights. Previously, Djankov et al. (2007) showed that better creditor rights are associated with a higher ratio of private credit to gross domestic product (GDP). Additionally, they reported that the ratio of private credit to GDP increases following improvements in creditor rights, but there is little convergence in the scores of creditor rights among legal origins over a 25-year period. Consequently, it seems that corporate bonds and loans are substitutes, yet at the same time, there are also large differences in the relative size of debt markets and the relative shares of bank loans and corporate bonds across countries.

Modigliani and Perotti (2000) indicate that in the bank-oriented financial systems, firms rely more on bank debt than on bonds, while the reverse pattern is true for some of the market-oriented financial systems, such as the US. According to them, a poor legal framework impairs the development of security markets, as it allows for

expropriation of minority shareholders and bondholders. As a result, bank lending emerges as a form of intermediation, as institutions have stronger monitoring and bargaining power than dispersed market investors. Thus, the relative attractiveness of security versus intermediated finance is very sensitive to the quality of legal enforcement. As bonds are standardized arm's-length contractual claims, it means that they should be classified as elements of the arm's-length financial system or market oriented financial system.

Rajan and Zingales (2002) underline that their classification of financial systems overlaps with the classification of systems as bank-oriented or market oriented, yet the two are not the same. In the idealized view, financial systems would fall into one of two distinct categories and include all their features. For example, if a system were bank-oriented, then we would expect that its banks are universal and engage in relationship lending. In practice, however, a country's financial system may combine institutional characteristics from more than one system. Therefore, we must classify systems separately along several different typologies. Indeed, Stulz (2004) defines the structure of the financial system as institutions, financial technology, and the regulations that specify how financial activity is organized in a country at a point in time. In practice, however, this definition may produce an infinite number of different structures of the financial system, which will comprise characteristics from both polar systems mentioned before. Thus, in the literature as well as in this chapter, for simplicity, the

binary approach is chosen to classify financial systems into bank-based and market-based financial systems.

The classification scheme for financial system discussed here relies on a set of indicators that are often used to measure the development of the financial sector. We need, however, to be careful, as there is a strong difference between financial system development and its structure. In the literature, it was hypothesis that the structure of the financial system may have an impact on growth at either the firm or economy level. Huybens and Smith (1999) show, however, that markets and banks are complements rather than substitutes and that it is the efficiency of the financial sector as a whole that is of importance. Indeed, Goldsmith (1969) already argued that the observed positive correlation between the size of the financial system and economic growth is driven by financial intermediation improving the efficiency rather than increasing the volume of investment. Thus, when analysing a financial system, strong differentiation needs to be taken between the development of the financial system and its structure, as was mentioned at the beginning. In this chapter, we concentrate only on discussing the research on the structure of the financial system, while the impact of the development of the financial system on economic growth is discussed in more detail in the chapter by Alexander Popov.

3.2 Does the structure of the financial system matter?

The empirical evidence discussed in the chapter in this book by Alexander Popov shows that financial systems can promote economic growth through several channels. However, the theoretical models indicate that at least two of the channels may differ depending on whether the financial functions are provided by banks or financial markets.

First, financial systems allow households and firms to intertemporally smooth expenditures and share risks potentially increasing the amount saved and hence investments. According to Thakor (1996), however, bank-based systems exacerbate effort aversion and overinvestment, whereas market-based systems lead to excessive reliance on borrower reputation as well as greater asset-substitution moral hazard. Green and Smith (1997) show, however, that with sufficient risk aversion on the part of the investing public, equity markets may produce stronger economic growth than do banks.

Second, by encouraging information acquisition and capital allocation, financial systems can promote growth by spurring technological innovations and improving capital accumulation. Dewatripont and Maskin (1990) and von Thadden (1995), however, suggest that banks tend to prolong low-quality projects, whereas markets often liquidate good projects prematurely.

Recently, Song and Thakor (2010) developed a model where banks and markets exhibit three types of interaction: competition, complementarity and co-

evolution. They argue that banks and capital markets complement each other and co-evolve through securitisation and bank equity capital. More importantly, their model indicates that banks and markets have different comparative advantages, which means that they compete only when they are viewed in isolation, yet not at the expense of the other. As a consequence, in the literature, a view emerged that the comparative importance of banks and markets for economic activity changes during the process of economic development, with markets becoming relatively more important for economic activity.

To sum up, the existing theoretical models show that financial intermediaries and markets may play different roles in those regards. These problems can lead to suboptimal investment decisions and as a result to lower real economic growth. Levine and Zervos (1998) argue that the empirical results confirm that banks provide different services from those of the stock market. Nevertheless, they did not provide any empirical evidence about the manner in which the services of banks differ from the stock markets, and how exactly this could have an impact on economic development. Indeed, as we will show in the following subsection, the empirical evidence on the relationship between the structure of the financial system and real economic growth is rather ambiguous.

3.2.1 Economic growth

In the literature, three main bodies can be distinguished that investigate the relationship between financial structure and economic growth. The first one directly examines the impact of the structure of the financial system on economic growth. Initially, studies comparing financial systems focussed on one country or only a small set of developed countries. Goldsmith (1969) pioneered this line of research as he tried to evaluate whether the financial structure influences the pace of economic growth. In this study, Goldsmith relied on a careful comparison of the financial systems in Germany and the United Kingdom, but his results on its impact on economic growth were ambiguous. Allen and Gale (2000) discuss financial systems in five industrial economies. Based on the relative importance of banks to capital markets in allocating resources to firms, they argue Germany, Japan and France have bank-based financial systems, while the United States and the United Kingdom have market-based financial systems. They note that all these countries have similar long-run growth rates. Hence, the marginal contribution for having different types of systems on real economic growth is not significant within this small group of developed countries in the long run. In contrast, Arestis, Demetriades, and Luintel (2001), using the five developed countries and time-series methods, argue that while equity markets in the developed countries may be able to contribute to long-run output growth, the influence of the stock market is much smaller than that of banks. Based on this, they argue that bank-based financial systems may be more growth-promoting than market-based financial systems.

Nevertheless, it is not clear from these studies whether their findings can extend to different countries across the world. Indeed, early on, Goldsmith (1969) already expressed the need to further investigate the relationship between the financial structure and economic growth using a larger set of cross-country data.

Demirgüç-Kunt and Levine (2001) and Levine (2002) have examined the relationship by employing a broad data set covering 48 countries from 1980 to 1993. They find that neither bank-based nor market-based financial systems are particularly effective in promoting economic growth. Their results were robust to an extensive array of sensitivity tests that included different measures of financial structure, alternative econometric methods, different data sets and more control variables such as legal factors. Moreover, the results changed only slightly when they were looking at different extremes, which are countries with very well-developed banks but poorly developed capital markets and countries with poorly developed banks but very well developed capital markets. However, Demirgüç-Kunt and Levine (1996) find that countries with a well-developed stock market also have well-developed banks and non-bank financial intermediaries. This suggests that intermediaries and markets are complements in providing growth-promoting financial services.

This conclusion has been supported by Beck et al. (2001), who document that countries do not grow faster with either type of financial system. Furthermore, they emphasize that what matters more for the finance-growth nexus is the efficiency of the legal system in protecting outside investors' rights. Rioja and Valev (2006) find that

bank-based financial systems are associated with stronger capital accumulation. Neither of these studies finds empirical support that bank-based or market-based financial systems foster long-run economic growth.

In contrast, Tadesse (2001) finds that the difference between bank-based and market-based financial systems is important in explaining economic growth. Using a sample of 36 countries from 1980 to 1995, he shows that in countries with an underdeveloped financial system, bank-based systems outperform market-based systems. However, in countries with developed financial systems, market-based systems outperform bank-based systems. He documents that a lack of fit between the country's financial system architecture and its legal institutions can restrain economic performance. Similarly, Luintel et al. (2008) find that the financial structure significantly explains output levels in most countries. They argue that the complete absence of cross-country support for a financial structure reported by certain panel or cross-section studies may be a result of inadequate accounting for cross-country heterogeneity. Taking into account the problems of existing studies and the use of time series and a dynamic heterogeneous panel method, they document that the financial structure and financial development affect output levels and economic growth. In a recent study, Demirgüç-Kunt et al. (2013) find consistent evidence that with the growth of economic activities, the association between an increase in real output and that in bank development decreases, while the association between an increase in real output

and that in securities market development becomes larger, suggesting the changing importance of banks and equity markets with the development of the real economy.

The existing empirical evidence suggests that both bank- and market-based financial systems are important for economic growth. Huybens and Smith (1999) argued that it is possible that markets and banks are complements rather than substitutes and it is the efficiency of the financial sector as a whole that is of importance. Levine and Zervos (1998) confirms that higher stock market liquidity or greater bank development is positively associated with contemporaneous and future rates of economic growth, capital accumulation, and productivity growth, irrespective of the development of the other. Thus, a view emerged in the literature that both financial structures might be substitutes in fostering long-run economic growth (Levine, 2002; Beck and Levine, 2004), which supports the recent research on financial crises that we will discuss in the next section of the chapter.

In the past decade, a new perspective emerged on the relationship between financial system development and economic stability. The ‘too much finance’ view indicates that having a too large financial system may have a negative impact on economic stability and growth. This theory is strongly supported by the global financial crisis of 2007-2009, where Rajan (2005) warned prior to it that the on-going evolution of the financial system may lead to a large and complicated system and to an accumulation of vulnerabilities that may then result in a financial disaster. Consequently, currently the question is whether there is a threshold when a financial

system supports economic growth and whether one structure of the system is better than the other for economic stability.

Cecchetti and Kharroubi (2012) show the relationship between financial development and economic growth is non-linear. It means that the level of financial development supports economic growth only to a point, after which it becomes a drag on growth. They estimate that the turning point is approximately 100 per cent of GDP for private credit and 90 per cent for bank credit. Similarly, Arcand, Berkes, and Panizza (2015) find that the relationship between financial development and economic growth has an inverted U-shape, where they estimate the turning point to be when credit to the private sector reaches 100 per cent of GDP. Law and Singh (2014) using a different methodology estimate the threshold at approximately 88 per cent of private credit to GDP and report an inverted V relationship.

Sahay et al. (2015) expanded the work and created a financial development index comprising both financial institutions and markets and three dimensions of financial development: depth, access, and efficiency. Using the index, they confirm the non-linear relationship between financial system development and economic growth. According to them, the weakening effect of the financial system on the economy is mainly due to financial deepening, rather than from greater access or higher efficiency. Seven and Yetkiner (2016) extended the research by analysing the impact of the structure of the financial system on economic growth in countries grouped based on the income level. They report that banking development is beneficial to growth in low- and

middle-income countries, yet harmful in high-income ones. In contrast, they show that the development of stock markets favour growth in middle- and high-income countries.

Sahay et al. (2015) show that the pace of financial development also matters. They document that when the development proceeds too fast, deepening financial institutions can lead to economic and financial instability. Silvia et al. (2017) confirm the non-linear relationship between financial development and economic growth. They also find that financial development simultaneously and more than proportionally raises growth volatility. A more detailed description on financial development and volatility is presented in the chapter by Loayza, Ouazad and Ranciere.

Gambacorta et al. (2014) report that banks and markets differ considerably in their moderating effects on business cycle fluctuations. On the one hand, they suggest that banks smooth the impact of the economic recession, as they are more likely to supply loans during a normal downturn. On the other hand, they find that their shock-absorbing capacity is impaired when the downturn is associated with a financial crisis. In those situations, they find that in countries with bank-oriented financial systems, the recessions are three times more severe than in countries with a market-oriented financial structure.

Langfield and Pagano (2015) attribute the rise in economic volatility to the increasing role of the banks in the European financial system. They document that the bank-based financial structures are associated with more systemic risk-taking by banks. In addition, the results indicate that the economic growth tends to be lower in bank-

based financial structures, particularly during times of large drops in asset prices. Hence, they recommend that reducing the bank bias should therefore be an important intermediate objective of financial policy. The switching of the structure of the financial system seems to be quite difficult, as we discuss in the next section. Moreover, Deidda and Fattouh (2008), using a theoretical model, show that a change from a bank-dominated financial system to a system with both banks and markets can have a negative effect on economic growth.

Consequently, the current research shows that the relationship among financial system development, structure and economic growth is quite complex, but there is currently a growing consensus that ‘too much finance’ can be harmful for economic growth. However, most of the empirical studies utilized only private credit as financial system development indicators. Given that equity and bond markets are also principal sources of finance, it is important to understand better their role and its relationship to economic growth. Consequently, more research is needed on the structure of financial systems and economic growth, which will take into account the recent findings on the impact of financial development on economic growth and stability.

3.2.2 Industry growth

The second strand of the literature focuses on the relationship between the structure of the financial system and industry growth. Beck et al. (2000) and Beck and Levine (2002), using cross-section data, attempt to establish whether the differences in country

financial structures affect the growth of different industries. On the one hand, the results of these studies indicate that the overall level of financial development and legal system efficiency exert a significantly and economically large effect on industry and economic growth. On the other hand, they do not find evidence that industries heavily dependent on external finance grow faster in either bank-based or market-based financial systems. In contrast, Carlin and Mayer (2003) argue that the differences in the structure of the financial system have had an impact on the real economy by affecting the growth and investment decisions of various industries. The industries heavily dependent on equity financing were found to grow more rapidly in countries with a market-based financial system. Additionally, they find that the structure of the financial system has a significant impact on industrial growth and on R&D investment. Carlin and Mayer (2003) is, in fact, the first study that has empirically found the impact of the financial structure on industrial growth and on R&D investment as well. Those findings were confirmed later by Binh et al. (2006), who report that industries with high R&D intensity, high operational risk, and high capital intensity grow faster in countries with more pronounced market-based financial structures.

Rajan and Zingales (1998a) show that industries that rely more on external finance in the U.S., grow faster in countries with more developed financial markets. Using a different approach to the question of the impact of the financial system on industry growth, Svaleryd and Vlachos (2005) report that countries with well-developed financial sectors specialize in industries heavily dependent on external financing. Moreover, they show that a developed and active stock market has a positive impact on

the specialization in financially dependent industries, while it is the opposite for countries with highly concentrated banking sectors. Hence, the authors argue that a financial sector is an important source of comparative advantage, which determines the countries industrial specialization.

Wurgler (2000) provides a complementary perspective by showing that the rate at which resources are allocated to productive industries depends on the development of the financial system. Indeed, Beck et al. (2008) find that financial system development exerts a disproportionately positive effect on small-firm industries, even controlling for the cross-industry differences in information opacity, asset intangibility, industry concentration and growth prospects. Hence, the results are not driven by the characteristics of small firms such as information asymmetry and higher intangibility, etc. However, they do not find evidence as well that the financial structure matters for the industrial growth rate.

Lin, Sun and Jiang (2009) argue that the demand for financial services is affected by the level of economic development and industrial structure. They propose that a structure of the financial system is optimal for a country at some stage of economic development only when the financial structure matches the industrial structure, which is determined by the factor structure in the economy. When the country's economy develops, the optimal financial structure evolves correspondingly. This argument is also consistent with Cull and Xu (2013), who demonstrate that the financial structure should be matched to the country's industrial structure, which is determined by the endowments and level of economic development.

3.2.3 Firm development

A large number of studies investigate whether the structure of the financial system determines firm creation and growth, which in turn may influence economic growth (Levine and Renelt, 1992). Demirgüç-Kunt and Maksimovic (1998) use firm-level data to analyse the impact of countries' structure of financial systems and legal institutions on firm growth rates. They show that greater external financing for firms is positively related to greater compliance with legal norms and the existence of a well-functioning stock market. In a subsequent paper, Demirgüç-Kunt and Maksimovic (2002) extend their methodology and examine whether the structure of the financial system determines firms' access to external financing to fund growth. They did not find any evidence that the relative levels of development of the securities markets compared to that of the banking sector affects firms' access to financing. In contrast, Agarwal and Mohtadi (2004) suggest that equity market development favours firms' equity financing over debt financing, while banking sector development favours debt financing over equity financing. Beck et al. (2013) provide a complementary perspective by exploring the relationship between the size of different financial institutions and their impact on firms' access to financial services. They show that the dominance of banks in most developing and emerging countries is associated with a lower use of financial services. However, larger banks may actually ease financing constraints of small firms in low-income countries.

Beck and Levine (2002) examine whether bank-based or market-based financial

systems are better in fostering new firm formation or existing firm expansion. They show that there is no robust relationship between financial structure and the rate of new establishment formation. Moreover, they do not find strong links between financial structure and the performance of either R&D-based or labour-intensive industries. They find, however, that the overall level of financial development along with effective contract enforcement mechanisms foster new establishment formation and more efficient capital allocation. Their results do not support the view that either bank-based or market-based financial systems explain firm growth patterns.

In sum, most of the studies do not provide consistent evidence that either bank-based or market-based financial systems are better for economic, industry or firm growth. However, there is a broadly consistent view that overall financial development and legal system efficiency are more important than the financial structure in explaining real economic growth.

3.3 Banks, markets and crises

The same mechanism that makes finance growth-enhancing also contains the seeds of crisis. For example, banks perform an important role in terms of maturity transformation, which allows investors to share risk, yet at the same time exposes them to the possibility of bank runs. The literature discussed in the previous sections does not explain this important aspect of growth, that is, the discontinuity of growth. Booms exist in some periods, which end in financial crisis with a negative growth rate. In this

section, we discuss how finance plays an important role in understanding these variations in growth.

Traditionally, there are two theories explaining the origins of banking crises. One line of argument is the panics view, which suggests that crises are random events that are triggered by extraneous variables or “sunspots”, unrelated to changes in the real economy (Bryant, 1980; Diamond and Dybvig, 1983; Cass and Shell, 1983). Although sunspots have no effect in the real economy, they affect investors’ beliefs in a way that turns out to be self-fulfilling. The second view is that banking crises are a natural outgrowth of the business cycle, indicating that crises are not random events but a response of depositors to the sufficiently negative information on the real economy (Jacklin and Bhattacharya, 1988; Allen and Gale, 1998; Allen and Gale, 2004).

Recent studies develop dynamic models of bank runs. He and Xiong (2012) consider the dynamic coordination between creditors who make rollover decisions at different time periods and show that the unique equilibrium is realized when pre-emptive debt runs occur through a “rat race” among creditors based on the publicly observable firm fundamentals. Martin, Skeie and von Thadden (2014) extend the model to shadow bank runs. Over time, financial innovation has transformed intermediation from a process involving a single financial institution to a process broken down among different institutions. An important difference with standard banking models is that the long-term assets can be traded in a market. They show that net asset sales in the form of securitization weaken a lender’s balance sheet and make non-banks more fragile. If

there is a shock to asset values that is sufficiently strong, then a run on all the non-banks is possible as a self-fulfilling expectation.

It is quite clear that the private sector and aggregate output decelerate during banking crises (Kaminsky and Reinhart, 1999; Demirgüç-Kunt, Detragiache and Gupta, 2006). However, there could be an endogeneity problem here, meaning that it is not necessarily the banking crisis that causes the output declines. The same exogenous adverse shocks that trigger banking problems may also cause a decline in aggregate demand, leading firms to reduce investment and working capital, and ultimately, demand for bank credit. Some empirical studies try to explore the real costs of banking crises on growth and the role of the financial systems.

Braun and Larrain (2005), for example, examine whether industries more dependent on external financing experience sharper output contraction during economic downturns. They find that the association is significantly positive and is economically stronger in countries with poor accounting standards and for industries with more intangible assets, suggesting that financial frictions are at work and may amplify fluctuations more significantly for industries that are dependent on external financing. Kroszner et al. (2007) study the effects of financial development on the relative growth of external-financing dependent industries in non-crisis and crisis periods. They find evidence that the impact of banking crises on the growth of industries dependent on external financing is more severe in countries with a less developed financial sector. The implications here are, first, the entire financial development helps

to mitigate the impact of a banking crisis on growth; second, operating in an environment where financial markets are well developed is an advantage for more financially dependent industries in good times, but a disadvantage in times of banking crises. Using a similar difference-in-difference strategy that was employed by Rajan and Zingales (1998a), Dell' Ariccia, Detragiache and Rajan (2008) argue that there is a real cost to banking crisis, and the costs are higher in developing countries where alternatives to bank financing are more limited. Hence, in more financially dependent industries, the output, capital accumulation and the number of new establishments grow less than for other industries during crises.

According to Greenspan (2000), the existence of legal infrastructure and multiple avenues of financial intermediation can buffer shocks from a financial crisis. In his opinion, the United States capital markets replaced bank access following the collapse in the value of real estate collateral in the 1990s. Conversely, in 1998, following the default of Russian financial institutions, commercial banks replaced the intermediation function of the capital markets. As a result, Greenspan (2000) argued that a diversified financial system could maintain an adequate degree of financial intermediation even if the main source of intermediation, whether banks or capital markets, freezes during a financial crisis.

Allen et al. (2012) empirically confirmed that there are reversals in the structure of the financial system during a financial crisis. However, their results indicated that, after a crisis, the financial system reverts to its previous structure after a

while. On the one hand, part of their results confirmed that different financial intermediaries could substitute for each other during a crisis. On the other hand, they showed that this effect does not determine the structure of the financial system in the long term.

Levine et al. (2016), using the data of the financial crisis of 2007, confirmed that the stock market may provide financing during a banking crisis. However, they also showed that the legal infrastructure must be in place so the equity market can substitute for the banking system during a crisis. Moreover, Gu and Kowalewski (2016) report that corporate bond markets develop faster than the equity markets during a banking crisis, which they interpret as a sign of the “spare tire” effect. They find, however, that the developments in the financial structure are short term in character, which is in line with the previous findings of Allen et al. (2012).

In conclusion, the existing results indicate that a more balanced structure of the financial system enhances its stability and can significantly buffer shocks from a financial crisis. In addition, countries with a more balanced structure recover faster from financial crises. Countries’ financial architecture plays an important role in explaining how financial crises affect the countries’ economic growth.

3.4 The growth of shadow banking

The crisis of 2007-9 provides a dramatic example of how damaging financial crises can be to the real economy. One of the causes of the crisis was the incentives in

the origination of mortgages and their securitization, the provision of ratings for securitizations and the flawed risk management and assessment systems for these. Securitization is a structured process that involves a bank transforming its illiquid assets, traditionally held to maturity, into marketable securities by pooling these assets together and transferring them into a special purpose vehicle (SPV) that in turn finances the purchase by issuing securities backed by the pool. In the past three decades, there was a tremendous increase in the size of securitization markets, partly driven by banks' search for higher yield, and partly fuelled by the increase in the amount of money that was seeking to be invested in deposit-like safe assets under the management of institutional investors (Acharya and Schnabl, 2010). Gorton and Metrick (2013) document that the rise in demand for asset-backed securities (ABSs) was also driven by the growing demand for collateral in both derivative and repo transactions.

Over time, the structured finance technique has fundamentally changed the role of banks as financial intermediaries. On the asset side of banks' balance sheets, banks started to distribute an increasing amount of loans that they had originated instead of holding them until maturity. This trend has led to the growth of financial intermediation outside the banking system, or shadow banking, with several institutions involved in the shadow intermediation process. With the specialization in the intermediation of credit, the cost that is associated with prudential supervision and regulation, investor disclosure and taxes have been significantly reduced (Adrian, Ashcraft and Cetorelli, 2015).

As noted above, the growth of shadow banking offers a number of benefits, such as the reduced cost of capital, greater liquidity and diversified risk across the financial system. Several recent papers have provided evidence that securitization led to weakening of lending standards (Mian and Sufi, 2009; Keys et al., 2010 and Dell’Ariccia et al., 2012; Allen et al, 2017a). Naduval and Weisbach (2012) estimate the extent to which the securitization of corporate bank loans in the form of collateralized loan obligations (CLOs) influenced the cost of debt for borrowers in the primary corporate debt market. They found that the spread of loan facilities that are securitized is 17 basis point lower than that of facilities that are not securitized.

With regard to financial stability, prior to the 2007 financial crisis, a predominant positive view of securitization essentially argued that it enhanced the resilience of the financial system by distributing risks across diverse parties (Adrian and Shin, 2008; Shin, 2009). However, the financial crisis revealed significant financial stability costs of shadow banking growth. The costs come from the issuance of short-term financial claims without explicit government guarantees by entities that do not have access to central bank facilities of the lender of last resort, which in turn expose these entities to runs when investors are concerned about their solvency (Gorton and Metrick, 2011). Some argue that the severe maturity mismatch of securitization increases banks’ rollover risks that are highly correlated within the financial system, and this further creates significant concentrations of systemic risks in the financial sector (Acharya, Schnabl and Suarez, 2013); others argue that the increase in

endogenous risk taking induced by securitization and other shadow banking activities may make the financial system less stable (Brunnermeier and Sannikov, 2014; Stein, 2012; Allen et al., 2017b). A sound understanding of the ultimate impact of shadow banking on stability and growth is crucially important; however, the studies on this issue are far from conclusive.

4. What determines the development of the structure of the financial system?

The economic literature has always underscored the influence of institutions – legal, political, social or cultural on countries' long-term economic growth (Robinson et al., 2004). At the end of the last century, economists also suggested that these factors might explain the development of the financial system and its structure across countries. In particular, recent research focuses on the role of the legal system, and political and cultural factors in determining the development and structure of the financial system. In this work, the authors take as a given that a functioning financial system is an important precondition for economic growth, which is sometimes called the finance-leads-growth perspective (Fohlin, 2012). In addition, this research also tries to link the factors mentioned above with the structure of the financial system in terms of their hypothesized impact on economic or industry growth. The strict dichotomy of the financial system presented in the literature, however, does not always correspond to the institutional factors. Hence, the financial system should be considered an amalgamation

of a set of indicators rather than as monoliths with overarching types such as market- or bank-based financial systems.

As we discuss in the rest of this section, legal and political factors show a significant relationship to the financial system structure and development, but causality is often difficult to establish. On the one hand, therefore, it is difficult to pinpoint reliable, consistent relationships among economic, political, and legal factors and the financial system. On the other hand, the existing results show that the initial conditions and the historical evolution of the financial system are important in explaining the current structure of the financial system and its impact on long-term economic growth. A detailed perspective on the historical factors and financial system development is presented in the chapter in this book by Thorsten Beck. In contrast, we will mainly concentrate in this chapter on the factors that may determine the structure of the financial system. As we mentioned in the introduction, we distinguish between the development and structure of the financial system. As we will see, however, many of the factors determine at the same time the development and the structure of the financial system.

4.1 Legal origins, financial structure and growth

In general, commercial laws come from two broad traditions: common law, which is British in origin, and civil law, which derives from Roman law. Reynolds and Flores (1989) provide information on the origins of national laws for over 100

countries. Based on this information, La Porta et al. (1998) classify a country as having a British, French, German or Scandinavian legal origin based on the source of each country's Company or Commercial Code. Their methodology was then followed by a large number of empirical studies on law and finance.

As pioneering empirical studies in law and finance, La Porta et al. (1997, 1998) essentially document that legal origin is important in explaining cross-country differences in financial development in terms of the size of the banking sector or stock market. It is also well documented that the law and the quality of its enforcement are potentially important determinants of the rights security holders have and how well these rights are protected. As the protection investors receive determines their willingness or readiness to finance companies, corporate finance may be affected by the law and its enforcement.

La Porta et al. (1998) show that countries with a common law tradition tend to have stronger creditor and shareholder protection than French civil law countries. La Porta et al. (2006) provide evidence that French legal origin countries also tend to have relatively weak liability rules and weak information disclosure requirements, such that the private contract enforcement in French civil law countries tends to be less effectively implemented than in common law countries. It is hence not surprising that countries adhering to a French civil law system have the least-developed capital markets. Hence, the civil law countries are more likely to have a bank-oriented financial system.

La Porta et al. (1997, 1998, 2006) show that common-law countries have higher levels of shareholder rights and correspondingly more developed equity markets. In addition, as the common law countries have better creditor rights, they tend to have more developed financial institutions as well. As a result, common law countries are more likely to have a market-oriented financial system.

Consequently, a view emerged that legal origins may influence the structure of the financial system. Moreover, the legal framework may also determine the type of banking practices that are more likely to dominate in the financial system. In countries with low transparency and weak enforcement, relationship banking is more likely to dominate, as banks are able to monitor firm activities and protect their interests. Conversely, where there are strong investors' rights that are also enforced, arms-length financing practices are more likely, and stock markets are more likely to develop (Rajan and Zingales, 2002).

4.2 Financial structure, investor protections and growth

Legal origin is not the entire story, as financial development does not always evolve monotonically and structural characteristics of financial systems also change materially over time. Hence, the legal origin, a time-invariant factor cannot explain the time-variation of financial development and structures across countries. Recent work suggests that investor protection and legal institutions influence both the corporate financing decisions of firms and the operation of financial systems.

One strand of literature documents that shareholder protection laws influence firm value and hence the cost of capital. When shareholder rights are better protected by the law, outside investors recognize that more of the firm's profits would come back to them as interest or dividends as opposed to being expropriated by the entrepreneur who controls the firm (La Porta et al., 2000b). Therefore, investors are more willing to pay more for equity or debt, suggesting that by limiting expropriation, the investor protection law raises the market price of securities. In turn, this enables more entrepreneurs to use external financing for investment projects, which leads to the further expansion of financial markets (La Porta et al., 2002; Bekaert, Harvey and Lundblad, 2010). Moreover, Wurgler (2000) documents that countries with stronger protection for small and outside investors more effectively reallocate the flow of funds towards growing firms and therefore boost the efficiency with which financial systems allocate capital. Some related work has also tried to draw a connection between investor protection and the efficiency of the stock market. Morck, Yeung and Yu (2000), for example, document that the degree to which legal institutions protect the rights of private property and minority shareholders helps to account for cross-country differences in stock market synchronicity. That is, in countries with less effective shareholder protection, domestic stock prices are more likely to move together, suggesting less information in individual stock prices.

The second strand of literature discusses creditor rights protection and bank credit. The theory of credit formalized by Townsend (1979), Aghion and Bolton (1992)

and Hart and Moore (1994, 1998) documents that what matters for the viability of private credit is the power of the creditor, suggesting that when lenders have greater ability to enforce repayment or take control of the firm in the event of default, they are more willing to extend credit. However, information-based theories developed by Jaffee and Russell (1976) and Stiglitz and Weiss (1981) argue that information matters more for lending. When lenders obtain more information, they will be less concerned about the lemons problems of financing nonviable projects. Based on these theories, Djankov, McLiesh and Shleifer (2007) explore the legal determinants of private credit using a sample of 129 countries around the world over 25 years. They find that countries with better creditor rights and creditor registries are associated with a higher ratio of private credit to GDP. More specifically, they provide evidence that creditor rights are particularly important for credit in the richer countries, whereas credit registries matter in the poorer countries.

More recent studies have tried to establish the causal link between creditor rights and bank credit using different approaches. For example, Haselmann, Pistor and Vig (2009) find that banks have increased the supply of credit subsequent to improvements in legal institutions in twelve transition economies. Through exploiting variation in legal institutions and employing the “quasi-natural experiment” approach, they show that countries with stronger creditor rights protection tend to have higher lending volume, and furthermore, law does in fact promote lending. Qian and Strahan (2007) also provide consistent evidence that stronger creditor rights expand loan

availability because in the presence of better legal protection during bankruptcy and reorganization, lenders are more willing to extend credit on favourable terms *ex ante*. In addition, they argue that creditor rights affect domestic banks and foreign banks differently. In countries with weak creditor protection, foreign banks own a smaller proportion of loans; hence, they tend to rely more on formal legal mechanisms to restructure distressed debt while domestic banks work out bad loans in a more private way (Mian, 2006). Bae and Goyal (2009) argue that variation in enforceability of contracts matters a great deal to how loans are structured and priced. Better creditor rights and enforceability of contracts increase loan size, lengthen loan maturity and reduce loan spread.

While country-level or loan-level cross-country evidence suggests in general that stronger creditor rights protection increases bank loan volume, studies at the firm level show some contradictory results. For example, using data on unlisted companies, Giannetti (2003) finds that in countries with better creditor rights, it is easier for firms investing in intangible assets to obtain loans. In other words, better creditor rights are associated with higher leverage.

Acharya and Subramanian (2009) find, however, that in countries with stronger creditor protection, technologically innovative industries innovate less and employ lower financial leverage. They explain this by modelling financing as the choice of leverage given the trade-off between the tax benefits and deadweight costs in bankruptcy. They show that the optimal financing decision involves lower debt under

better creditor rights in order to pursue efficient innovation. Acharya, Amihud and Litov (2011) further provide evidence that corporate leverage declines when creditor rights in bankruptcy are stronger, and this relationship is stronger in countries where management is dismissed in reorganization.

Using India's securitization reform in 2002 as an experiment, Vig (2013) shows that the strengthening of creditor rights led to a reduction in secured debt, total debt and asset growth. He explains it by arguing that there exists another possibility that firms can opt to reduce the amount of collateral for the same amount of secured loan even if the creditor rights protection is strengthened. Under such an assumption, a reform that strengthens secured creditor rights would cause secured debt to either increase for those borrowers who were financially constrained and could not borrow before, or stay at the same level for those borrowers who are concerned about some inefficiencies, as they can revert back to the old regime. The implication is that stronger creditor protection may benefit some borrowers by increasing the debt capacity; however, it may also cause other borrowers to be worse off. More research is needed to understand different situations and the aggregate welfare effects.

As noted above, stronger creditor rights in default may lead to inefficient liquidation or mandatory dismissal of management in bankruptcy, which may impose more costs on shareholders or managers. Therefore, shareholders and managers may lower the likelihood of distress by reducing cash-flow risk, which could result in foregoing profitable investments for undertaking value-decreasing diversifying

investments. By modelling a firm investment choice between innovative and conservative technologies, Acharya and Subramanian (2009) show that the nature of bankruptcy codes alters not only the financing decision but also the choice of real activity. When the bankruptcy code is creditor-friendly, technologically innovative firms innovate less and grow disproportionately slower. Acharya, Amihud and Litov (2011) also document the downside effects on investments by showing that stronger creditor rights induce firms to engage in diversifying acquisitions that are value-reducing. Nini, Smith and Sufi (2009) show that a large percentage of private credit agreements contain an explicit restriction on firms' capital expenditure, which will further cause a reduction in firm investments. Chava and Roberts (2008) find that restrictive debt covenants and enforcement covenant violations, which strengthen creditor rights, inhibit capital investments as well.

Other studies document the relationship between property rights and firm investment and growth. Johnson, McMillan and Woodruff (2002) show that in transition countries with stronger private property protection, entrepreneurs are more likely to reinvest their profits. Cull and Xu (2005) use China as an example and show that both property rights protection and access to credit matter for firm investment policy. Claessens and Laeven (2003) document that legal institutions also have an impact on resource allocation through influencing the countries' industrial structure. Industries that rely more on intangible assets grow faster in countries with better legal protection.

4.3 Financial structure and politics

Another explanation for the design of the financial system is based on political factors. Given the importance of financial systems for economic growth, it is not surprising that the policies for the financial sector are often on the top of policy makers' agendas, particularly during crises. A large number of papers discuss the impact of politics on the finance-growth nexus, which can be roughly divided into two different views. We will go through both of them in turn.

The first view basically argues that policy makers act in the best interest of society, ultimately maximizing the growth benefits for the entire economy. Therefore, the market failures inherent in financial systems require government interventions beyond regulation and supervision. For example, Song and Thakor (2012) develop a theory of how a financial system is influenced by political intervention that is designed to expand credit availability. They show that the relationship between political intervention and financial system development is non-monotonic. In the early stage of financial development, the size of the market is relatively small, and politicians intervene by controlling some banks and providing capital subsidies. In the intermediate stage when the sizes of both the banking sector and market are larger, there is no political intervention. However, in the advanced stage when the financial sector is most developed, political intervention returns in the form of direct-lending regulations.

The second view argues that policy makers act in their own interest, maximizing private rather than public welfare. Therefore, interventions by politicians

in the event of a crisis involve diverting the flow of credit to politically connected agents instead of improving social welfare. Rajan and Zingales (2003, 2004) are good examples of this view. They argue that the structure of the financial system may experience substantial reversals when a political majority decides to alter the legal framework. A financial system will develop towards the optimal structure but will be hindered by politics, which are often influenced by powerful incumbent groups. Thus, financial development and changes in structure can occur only when the country's political structure changes or when incumbents want the development to occur. Similarly, Cull and Xu (2013) document that financial development is driven by the political economy, and furthermore, financial development may reflect the interests of the elite, rather than providing broad-based access to financial services, by modelling the choice of investor protection as a legislative or enforcement choice taken by politicians. Feijen and Perotti (2005) also show that access to external financing can be used by incumbent political and economic elites to protect rents and entrench their dominant position (see also Perotti and von Thadden, 2006)

U.S. financial history provides numerous examples of political influence affecting the development of the banking system. The same is true for emerging economies such as China. By studying the political economy of regulation in the U.S. during the 18th and 19th centuries, Benmelech and Moskowitz (2010) argue that financial regulation is the outcome of private interests using the coercive power of the state to extract rents from other groups, which is further associated with lower future

economic growth. They document that the tension between private and public interests provides an explanation for the variation in usury laws observed across states and time. States adopted laws to hamper competition from neighbouring states and lower their own cost of capital. The link between private interests and financial regulation also suggests the endogenous relationships between financial development and growth. Kroszner and Strahan (1999) find that the private interest theory of regulatory changes can account for the pattern of bank branch deregulations in the 1970s and 1980s in the U.S. They argue that innovations that began in the 1970s altered the value of restrictions to the affected parties and the subsequent competition among interest groups can explain deregulation. However, some of their results also show that deregulation occurs earlier when small banks are in a weak financial position, which is still consistent with the public interest theory. Studies on China's financial sector also suggest that political factors are strongly associated with the bank loan granting and equity financing (see, e.g., Ayyagari, Demirgüç-Kunt and Maksimovic, 2010; Fan, Wong and Zhang, 2007).

Some other studies have tried to use the political structure as a basic factor to explain financial development and economic growth. Both theoretical and empirical studies show that political and economic elites can manipulate institutions (Glaeser et al., 2003). Powerful political interest lobbies influence the type of property rights protection and the degree of investor protections that suit their interests best. Pagano and Volpin (2005) show that proportional electoral systems are conducive to weaker shareholder protection and stronger employment protection, which benefits

entrepreneurs and workers while damaging outside shareholders. Other political variables, such as ideological factors, voting thresholds and the tenure of the democratic system, appear to affect regulatory outcomes.

Therefore, political institutions seem to have a first order effect on economic and financial stability in the literature. Poor transparency and corruption or weak regulatory institutions increase the probability of a banking crisis after financial liberalization (Acemoglu et al., 2003). The issue is, even when liberalization leads to a higher level of GDP growth, the distribution of gains remains a relevant question to ensure its sustainability. For example, in Latin America, financial transfers following banking crises have targeted privileged income classes. In the meanwhile, default costs are usually socialized through regressive policies, such as inflationary bailouts or fiscal cuts, that disproportionately hurt weaker social groups and median income households (Das and Mohapatra, 2003). Bekaert, Harvey and Lundblad (2006) show that the volatility of the economy in terms of consumption growth following equity market liberalization depends on the economic, financial, social and political conditions within a country. If a country has a relatively well developed banking sector, less external and internal conflicts, a large government sector and a relatively brighter economic outlook, then consumption growth tends to be less volatile after the liberalization. In this sense, political factors are more important than legal factors in driving economic volatility.

4.4 History, culture and important factors

In recent years, a number of studies have pointed to other theories that try to explain the development and structure of the financial system. One of these theories advocates that financial systems have a path-dependent nature. It means that financial system development and its structure is shaped by the initial conditions and historical evolution of the country. Ang (2013) shows that the existing differences in financial development between countries can be explained by the variations in their levels of state experience over the last two millennia. His results suggest, however, that state history has stronger explanatory power for current financial development than financial development over the last half century. Moreover, his results indicate that state history positively affects both bank-based and market-based financial systems and there is no systematic difference between them. Monnet and Quintin (2005), furthermore, argue that history matters not only for the development of the financial system, but may also explain its current structure. On the one hand, Monnet and Quintin (2005) argue that the legal differences in countries with bank-based and market-based financial systems are fading as a result of government efforts to deregulate and liberalize financial systems around the world. On the other hand, institutional convergence has not implied financial convergence across countries. Monnet and Quintin (2005) suggest that financial systems will continue to differ for a substantial period even if their basic characteristics become identical. The argument is based on the assumption that the historical fundamentals of financial systems are relevant and any change in structure is costly. Thus, they claim that the previous structure of a financial system explains and

determines the existing structure. The work of Monnet and Quintin (2005) provides some explanation as to why financial structures persist in countries following changes in the institutional framework. However, their work does not provide a clear explanation of why determinants change over time.

Another perspective presents the endowment theory that ties the development and structure of the financial system to the colonial conditions such as geographic factors and the disease environment in shaping subsequent institutional and financial development. Acemoglu et al. (2001) argue that European colonizers pursued different types of colonization strategies with different associated institutions. In some countries, the Europeans installed property rights institutions that protected private property contracts, which subsequently promoted financial development. Acemoglu et al. (2001) underlined, however, that colonial experience is only one of the many factors affecting institutions and henceforth also financial development.

A related theory has been proposed by Stulz and Williamson (2003), who argue that culture matters for financial development since it affects values, beliefs, institutions and how resources are allocated in an economy. Stulz and Williamson (2003) indicate that a country's principal religion predicts the cross-sectional variation in creditor rights better than the origin of its legal system. They report also that religion and language are important predictors of how countries enforce rights. Based on their findings, they argue that Catholic countries protect the rights of creditors less than do Protestant countries, which may explain why Catholic countries have less developed financial

systems. A similar perspective is presented by Kwok and Tadesse (2006), who argue that national culture may be an important determinant of a country's financial structure and presented evidence that countries characterized by higher uncertainty avoidance (risk aversion) are more likely to have a bank-based system.

Finally, Allen et al. (2016) suggest that a country's financial system adapts to the needs of the real economy. They show that in countries with a well-developed service sector in the economy, a market-based system is more likely to emerge. In contrast, countries with large industrial sector (fixed assets) are more likely to have a bank-based system. Consequently, their research suggests that specialization patterns in a financial system are influenced by the composition of the economy, which in turn is determined by a country's endowments.

This variety of approaches suggests that there is no consensus with respect to the determinants of financial structure. Moreover, economic and legal factors show strong relationships to financial system design and development, but causality is difficult to establish. Hence, although social and political context play important roles in shaping institutions, it is difficult to pinpoint reliable and consistent relationships among economic, political, legal and financial variables. Moreover, the recent results show that even political and regulatory intervention influences system design and the political system type does not have any systematic or predictable effect.

5. Concluding Remarks

We have covered a large literature on financial structure and economic development in this chapter. Theory suggests that banks and markets exist to mitigate agency and asymmetric information problems in different ways. It turns out that banks play an important role in delegated monitoring, allocating capital and sharing risks in the economy by diversifying and smoothing fluctuations over time while markets potentially perform better for new technologies. In practice, the structure of financial systems varies strongly among countries. The existing literature has tried to explain the difference from legal, political or cultural perspectives. It is suggested that the impact of the financial structure on national or firm level growth is also dependent on the overall level of economic and institutional development. In countries with higher quality financial services, better legal protections and political institutions, the nexus between finance and growth tends to be stronger.

However, the question of how financial structure characteristics affect economic development is not fully understood yet. There are also other potential factors influencing the finance-growth relationship that we have not covered in this chapter, such as history and culture. The recent growth of shadow banking, which increases the reliance of banks on markets, also raises new questions in this area. On the one hand, the existence of shadow banking reduces the cost of capital through specialization and allocates capital and boosts economic growth more efficiently by aligning the needs of banks and investors. However, on the other hand, it may also make the financial system less stable and economic growth more volatile. Moreover, as we have discussed in the

previous sections, there is also a growing literature that ‘too much finance’ may hinder further economic growth. A sound understanding of these issues is certainly a direction for future research.

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Figure 1

Structure of the financial system: Banks vs Stock market

The data present the financial structure measured as private credit by deposit money banks to GDP vs domestic stock market capitalization to GDP using five-year averages for the periods 1975-1979 and 2010-2014.

