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Where Is The Cheese?

Synthesizing a Giant Literature on Causes and Consequences of Financial Sector Development

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Abstract

A likely image of the current state of the literature on financial sector development is that of a Swiss cheese with many holes inside important areas of knowledge. The aim of this synthesis paper is to map the current knowledge and ignorance (i.e., holes) in the literature by providing a narrative for the empirical findings of a comprehensive literature review concerning the quantitative effects of financial development on economic growth and employment, and various determinants of financial sector development. The literature was restricted mostly to high-quality academic research that focuses on developing countries over the period 1960–2012. Because of data constraints, this review also includes cross-country analyses, in which developed and developing countries are considered together. The main findings include (i) a positive relationship between financial development and economic growth and employment, subject to a number of qualifications; (ii) a complicated relationship of regulations and supervision to financial sector development; and (iii) a positive relationship between an enabling institutional environment and financial sector development. This review also identifies some missing avenues in the literature and provides a number of suggestions for future work.

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1. Introduction

The importance of finance in the economic development trajectories of developing countries is by now widely recognized. The motivation behind this synthesis paper is to investigate causes and consequences of financial sector development by establishing an inventory of high-quality academic research with special emphasis on quantitative implications of finance for economic development in developing countries. The idea is to acquire an understanding of what has been established in the literature and to provide insights for policy making. Essentially two questions drive the motivation for this paper:

- How does a country's financial system affect its economic development?
- How can countries improve their financial systems?

The Financial Sector Reform and Strengthening (FIRST) Initiative[2] at the World Bank has identified these questions as highly policy-relevant on the basis of its comprehensive conceptual framework for financial sector reform. The underlying premise is that once the statistically significant and economically meaningful effects of finance on economic development are established, it is crucial to identify what types of policies are associated with financial development. The main lessons drawn from the literature can help the FIRST Initiative provide further assistance to its clients based on their context-specific profiles.

Before moving any further, we should first clarify these two questions. By *economic development*, we restrict our attention to economic growth and employment and initially set aside other dimensions such as inequality and poverty. By *financial systems*, we adhere to a broader definition that includes banking sectors, capital markets, and contractual savings institutions. By *improving* a financial system, we mean increasing financial depth, efficiency, and inclusion while ensuring financial stability.[3] Against this backdrop, the aim of this synthesis paper is to narrate the quantitative evidence on (i) the effect of financial sector development on economic growth and employment, and (ii) the determinants of financial sector development, with specific attention to policy variables such as regulations, supervision, and an enabling institutional environment.

In total, 184 of more than 200 high-quality academic research papers were selected for this narrative. While about 100 papers address the finance-growth nexus, only a handful examine the finance-employment nexus. The remaining papers dwell upon the determinants of financial sector development. In our selection, we focused solely on empirical academic articles with specific attention to developing countries.[4] The findings of this literature review are briefly summarized as follows:

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[2] The Financial Sector Reform and Strengthening Initiative (FIRST) is a multi-donor grant facility that funds technical assistance (TA) to promote financial sector development in the low- and middle-income countries. FIRST is supported by the Canadian International Development Agency (CIDA), the Department for International Development of the United Kingdom (DFID), the International Monetary Fund (IMF), the Ministry of Foreign Affairs of the Netherlands, the State Secretariat for Economic Affairs of Switzerland (SECO), the Swedish International Development Cooperation Agency (SIDA), the Germany's Federal Ministry of Economic Cooperation and Development (BMZ), the Ministry of Finance of Luxembourg, and the World Bank.

[3] Although the first two components are commonly scrutinized, the latter two require more attention from academic literature.

[4] Because the literature is dominated by cross-country studies, we broadened our criteria to empirical analyses that stack developed and developing countries together.

- **Finance-Growth Nexus:** Financial sector depth (i.e., banking sector, capital markets, and contractual savings industry) has a statistically significant and economically meaningful positive effect on economic growth. The magnitude of this effect is an acceleration of about 1 percentage point in annual growth of real gross domestic product (GDP) per capita; however, this effect is subject to numerous qualifications. A stable and efficient financial system with accessibility also contributes positively to economic growth.

- **Finance-Employment Nexus:** Financial sector depth has a statistically significant positive effect on employment. Unfortunately, this conclusion derives from only a few papers that have not scrutinized the relationship as much as the papers addressing the finance-growth nexus relationship.

- **Determinants of Finance**: Institutions (e.g., creditor rights, credit registries, accounting standards, rule of law, quality of contract enforcement, etc.) matter for the depth, stability, efficiency, and inclusiveness of the financial sector. Only some types of regulations and supervision are positively related to financial sector development (e.g., timely and easily accessible and comprehensible disclosure of information, removal of entry barriers into financial system, less extensive deposit insurance). While the extent of government ownership of banks is associated with less deep, inefficient, and unstable financial systems, the opposite holds for foreign ownership. Last but not least, although the effect of concentration on financial sector development is not yet resolved, more competitive and contestable financial systems are associated with greater financial sector development.

The structure of this paper is as follows. Section 2 presents the finance-growth nexus in six subsections that reflect the angles that academic literature has taken to examine this nexus. Section 3 briefly reviews the empirical evidence on the finance-employment nexus. Section 4 reviews determinants of each component of financial sector development. Section 5 briefly discusses the causes and consequences of insurance and pension sector development. Section 6 concludes with suggestions for future work.

2. Finance and Growth

The lion's share of the references cited in this synthesis paper relate to the finance-growth nexus, which also has the longest history among the topics covered in this paper. Despite that history, the literature is definitely not satiated, as it is not difficult to come across very recent papers attempting to contribute to it. Given that we were faced with a large volume of papers, we used an intuitive categorization to ease the process of navigating through this document.[5]

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[5] A comprehensive survey of empirical and theoretical research on the finance-growth nexus is presented by Levine (2005), who also offers various critiques of empirical methodologies and findings.

First, we start by synthesizing academic research that examines the relationship between financial depth and economic growth. Without a doubt, this relationship has received the most attention in the literature. In the first subsection, we cover articles that focus on banking sector depth. Since we are mostly concerned with developing countries, the selected articles mostly focus on banking sectors, or the dominant sector in financial systems of developing countries. Having said that, there are a few articles that examine the relationship between stock market development and contractual savings institutions on one hand and economic growth on the other, including in emerging and developing countries.

Second, we allocate some space to the critiques of initial findings about the finance-growth nexus and discuss various forms of nonlinearities and heterogeneities found therein. Recently, it has been found that the effect of finance on economic growth does not increase monotonically and that various thresholds such as the level of income, financial development, and inflation affect the strength of the association found in the early literature. We also recognize important heterogeneities, as empirical evidence is sensitive to variation across regions and periods.

Third, we focus on the second hottest topic related to the finance-growth nexus, namely the effect of financial stability on economic growth. Because financial stability is a part of overall financial sector development, it would be a grave mistake to miss the important consequences of financial fragility in the form of growth collapses or reversals and output losses. In this context, we start by reporting the effect of financial liberalization on economic growth, then take into account the destabilizing effects of financial liberalization and emphasize the significant negative effects of financial fragility. We end this subsection by referring to papers that examine the relationship and the trade-offs between regulations and economic growth. Last but not least, we present interesting results from the rather narrow literature that examines the effects of financial efficiency and inclusion on economic growth.

There are a number of caveats worth mentioning. First, this review does not include a major strand of the literature, one that examines the finance-growth nexus with time-series econometric methodologies (e.g., vector-auto regression models). Because our focus is quantitative effects, it will not be helpful to consult this strand of literature, which is heavily polarized without much consensus. Second, the coefficient estimates reported in the body of the text and in our inventory should be considered with a healthy dose of caution, because usually they are not fully exploitable elasticities. For our purposes, the ideal article would use the most relevant data (i.e., only developing countries for a long period of time) with a robust identification strategy; such an article does not exist. Nevertheless, quite a number of papers come close to our ideal and provide some very useful insights. Last but not least, our inventory of empirical results appears in the appendix, which consists of 18 tables associated with at least one hypothesis within each subsection. We do not refer to every article in our tables, so we recommend that the reader consult these tables while reading the associated subsection.

2.1 Financial Depth and Economic Growth

2.1.1 Banking Sector Development and Economic Growth

The empirical literature on the relationship between financial sector development and economic growth essentially starts with the seminal work by King and Levine (1993).[6] Apart from opening Pandora's box, they also have set the standards for the use of variables in empirical research. On the left-hand side, they used the growth rate of real GDP per capita and attempted to explain cross-country variation in growth rates by the variation in various indicators of financial sector development, including financial depth or size and financial intermediation. Their first measure of financial depth is the ratio of liquid liabilities to GDP (i.e., M3/GDP).[7] Second, they consider the ratio of deposit money bank domestic assets to deposit money bank domestic assets plus central bank domestic assets. This indicator aims to measure the level of risk sharing and information services provided by money banks. Third, they focus on financial intermediation, proxied by the proportion of credit allocated to private enterprises by the financial system (i.e., the ratio of claims on the nonfinancial private sector to GDP and also to total domestic credit). These three variables are the most commonly used proxies for financial development in academic research.[8]

A large variety of formal econometric methodologies is used in this literature, subject to the availability of data. Among them we can list ordinary least squares (OLS), two-stage least squares (2SLS), instrumental variables (IV), and three-stage least squares (3SLS) estimators for cross-sectional data. Dynamic panel methods such as difference or system generalized method of moments (GMM) are used for panel data. Before moving to the results shown in this literature, consider the following descriptive insight that is often cited in the literature. As Rioja and Valev (2004a) put it, countries that do not increase their financial depth experience negative growth rates (e.g., Haiti and Senegal), but countries with moderate levels of financial depth experience high and positive growth rates (e.g., Thailand and Cyprus). However, this positive relationship disappears when highly developed countries are considered. For instance, the effect of a marginal increase in financial depth has not much effect on growth in Switzerland or in the United States. The importance of this insight will become more clear when we discuss nonlinearities in the finance-growth nexus.

Table 1 in our inventory presents empirical results extracted from a body of highly cited academic research that addresses the following empirical question: To what extent does financial sector development, proxied by the banking sector depth, affect economic growth rates? Theoretically, there could be positive, negative, or no effects of finance on growth. Empirically, the literature presents evidence for each option but the positive

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[6] At least two influential empirical articles precede King and Levine (1993), namely Goldsmith (1969) and McKinnon (1973). However, formal econometric procedure is first used by King and Levine (1993), whose analysis represents the first attempt to move away from simple correlations to potential causation.

[7] Some articles also rely on (M3−M1)/GDP.

[8] An interesting recent study by Beck et al. (2012) finds that in the finance-growth nexus, what matters is credit to enterprises, not credit to households. In addition, Japelli and Pagano (1994) show that relaxing the liquidity constraints of households during the financial deregulation period of the 1980s lowered growth rates in countries of the Organization for Economic Co-operation and Development (OECD).

effect of finance is clearly dominant.[9] King and Levine (1993); Levine (1998); Levine and Zervos (1998); Levine, Loayza, and Beck (2000); Beck, Levine, and Loayza (2000); and Beck, Demirguc-Kunt, and Maksimovic (2004) all provide frequently cited positive effects of financial depth on economic growth. Table 1 clearly shows that the quantitative effects vary from study to study, as they use different financial development proxies, econometric specifications, and data. In general, the overwhelming majority of the literature has found significant positive effects of banking sector depth on economic growth.

To give a bird's eye view, let us suggest the following upper and lower bounds for the quantitative effects:

- **Upper Bound:** A 10 percentage point increase in financial depth accelerates annual economic growth rate by an additional 1 percent, at best. Accumulating over a sample period, say five years, the best-case scenario is that real output would be 5 percent more than what it actually was. This is an economically significant phenomenon.
- **Lower Bound:**[10] There is no significant relationship between finance and growth, or the effect is too small to be considered economically meaningful.[11]

Quite a few problems are associated with cross-country growth regressions. Usually, academic research moves toward panel data methods to deal with some of these well-known weaknesses but it is also helpful to look at country studies, where the internal validity of econometric procedures tends to be more robust, at the expense of external validity.[12] Table 2 in our inventory presents some evidence on the finance-growth nexus from within countries such as Brazil, China, India, and Vietnam. The articles find quite sizable effects of finance on growth. For instance, Anwar and Nguyen (2011) estimate that economic growth in Vietnam would accelerate by 18.3 percent as a consequence of a 10 percentage point increase in banking sector development.

So far, the focus has been on the effect of financial development on the first moment of economic growth, but economists also consider the effect of financial development on growth volatility. The articles cited in Table 3 make it clear that increasing financial depth significantly lowers growth volatility and thus performs a stabilizing role in developing countries. Another interesting question is to what extent financial deepening can accelerate the convergence of growth rates across the world. The key insight from the remaining articles in Table 3 is that developing countries with higher financial sector development are more likely to catch up and transition to the high-income group.

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[9] The reader should keep in mind that identification of the causal relationship between finance and growth is a very difficult task and even the most frequently cited articles explicitly accept this weakness.

[10] In this giant literature, a few papers find a negative relationship between financial intermediation and economic growth. For instance, Shen and Lee (2006) suggest that a 10 percentage point increase in financial depth leads to a 0.5 percent decrease in the GDP growth rate. This negative effect is exacerbated in middle-income countries with insufficient creditor protection and countries that suffer from banking or currency crises, especially in Latin America and Sub-Saharan Africa.

[11] We should note that the sample period considered in these studies is usually long, 20–40 years, so even if the effect is close to zero, over time the impact on output is substantial.

[12] Specifically, country-level studies help improve the identification of a causal relationship but results cannot be generalized to other contexts.

2.1.2 Stock Market Development and Economic Growth

Capital markets play a crucial role in the finance-growth nexus. Because financial sectors in developing countries are dominated heavily by banking sectors, however, we can refer to only a few articles that estimate the effect of capital markets on economic growth in developing countries.[13] Table 3 in our inventory on the quantitative effects of stock market development on economic growth shows that unlike for banking sector development, this subliterature does not find any negative or insignificant effects. Specifically, the effect of stock market liquidity on economic growth is significantly positive and ranges between 0.5 and 1.14 percent in response to a 10 percentage point increase in a stock market proxy. Stock market liquidity is found to be more robustly (both statistically and economically) associated with economic growth than is stock market capitalization. Shen and Lee (2006) argue that the effect of stock market development is higher than the effect of banking sector development on economic growth. Yet they argue that this positive effect is higher for developed countries. A tempting question is whether banking structure plays an important role in economic growth. Levine (2002) and others offer an important insight: what actually matters is the level of financial activity, which includes both stock market liquidity and banking sector depth.

2.1.3 Contractual Savings Institutions and Economic Growth

The finance-growth nexus is not limited to the growth effects of banking sector or stock market development. A burgeoning literature[14] has focused on the impact of growth in the insurance and pensions sectors on economic growth. For the insurance-growth nexus, various mechanisms are hypothesized to link insurance development and growth. Essentially, an insurance market is an institutional investor that can (i) offer risk diversification; (ii) mobilize savings, encourage accumulation of new capital, and simplify the efficient allocation of existing capital in the domestic economy; and (iii) contain financial fragility.[15] In terms of data, two proxy variables are used to measure the level of insurance sector development, namely insurance penetration (i.e., the ratio of insurance premium volume to GDP) and insurance density (i.e., premiums per capita). This growing literature mostly focuses on life insurance penetration and density. Table 5 in our inventory shows some conflicting results: some papers identify growth effects of insurance sector development greater than the growth effects of banking sector and stock market development, while others find smaller effects. While some argue that the effect is larger in developed countries, others provide evidence for higher growth effects in low-income countries. Overall, this small literature finds a significant and positive effect of insurance sector development on economic growth. The magnitude of the effects is, at times, too good to be true.

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[13] The literature has often used stock market depth and liquidity to measure stock market development (i.e., the ratio of total value traded to GDP and the ratio of stock market capitalization to GDP).

[14] For a literature review of 80 empirical papers, we refer the reader to Outreville (2011). Because our focus is only developing countries without time-series econometrics, our inventory is much smaller.

[15] Even though the papers in Table 5 do not attempt to specifically identify each channel, they still try to identify whether there is an overall association between the two variables.

For the pensions-growth nexus, the main mechanism cited by the selected papers is that growth rates accelerate with higher saving rates, better capital markets, and lower labor market distortions. An additional channel for economic growth is the improvement of corporate governance in response to the accumulation of pension assets. While Holzmann (1997) and Hu (2005) focus on pension sector reform (i.e., a switch from pay-as-you-go systems toward funded systems), Davis and Hu (2008) and others consider the effect of pension sector assets on economic growth and find positive effects from pension sector reform and development. Consequently, our reading of the literature suggests that development of both the insurance and the pensions sector is positively associated with economic growth. Further research is necessary, however, to clarify the conflicting results found in the literature.

2.1.4 Nonlinearities and Heterogeneities

Recent research has challenged the implicitly held assumption that the relationship between finance and growth is linear and has presented evidence for various forms of nonlinearities. For instance, the positive effect of finance for countries disappears beyond a certain threshold, be it the level of income, financial development, inflation, or employment in the financial sector. Also, more and more region-specific analyses are being conducted, including in Latin America and in the Middle East and North Africa. Table 6 in our inventory presents some very interesting results from the literature.[16]

The hottest topic in nonlinearities relates to the threshold for the level of financial development. This topic has received quite a bit of attention, especially during the recent global financial crisis. A legitimate question is whether the positive effect of finance on growth turns insignificant or negative beyond a certain threshold. Focusing on financial depth, Arcand, Berkes, and Panizza (2012) estimated that finance starts exerting a negative effect on economic growth when financial depth reaches 100 percent of GDP. Eschenbach and Francois (2005) estimate this threshold between 70 and 100 percent. Aghion, Howitt, and Mayer-Foulkes (2005) present an interesting descriptive statistic in that the positive effect of finance on growth vanishes after a country goes beyond the level of financial depth in Greece (e.g., the ratio of private credit to GDP exceeds 39 percent). Using a different proxy of financial depth (ratio of liquid liabilities to GDP), Rousseau and Wachtel (2011) estimate the critical threshold at about 40 percent. Even though there is convincing evidence that financial development beyond a certain threshold is not good for economic growth, it is not yet clear why this is the case. Further research should clarify various mechanisms that could generate such nonlinearities.

The level of income is yet another threshold that complicates the effect of finance on economic growth. One hypothesis suggests that the effect of finance on growth should be larger in developing countries than in developed countries, because developed countries already have highly developed financial sectors. However, a competing hypothesis conjectures that the positive effect of finance on economic growth is conditional on

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[16] Interestingly, there is some decent literature on the finance-growth nexus in Sub-Saharan Africa. Yet this literature heavily relies on time-series econometrics and hence is excluded from this survey.

institutional quality. Because developing countries have on average lower institutional quality than developed countries, the effect of finance on growth may be higher in developed countries. Another hypothesis, put forward by Rioja and Valev (2004a), is that the positive effect of finance on growth in developing countries operates through accelerated capital accumulation, while the positive effect in the developed countries operates through productivity growth.

Unfortunately, there is not yet consensus on the sign of the relationship for countries at other stages of development. For instance, Rousseau and Wachtel (2011) and Rioja and Valev (2004a) find that the magnitude of the effect of finance on growth is higher for developed countries. However, Rioja and Valev (2004b) and Demirguc-Kunt, Feyen, and Levine (2011) find that the effect is higher for countries in the lower and/or middle of the distribution than at the higher end. Another interesting result is that while diminishing returns hit earlier for banking sector development, they take longer to occur for stock market development. The latest evidence from Beck, Degryse, and Kneer (2013) suggest that while financial intermediation is associated with lower volatility in low-income countries, financial nonintermediation activities are associated with higher volatility in high-income countries.

Two other interesting thresholds were discovered by recent research. First, Rousseau and Wachtel (2002), Rousseau and Yilmazkuday (2009), Yilmazkuday (2011), and Huang et al. (2010) all study whether there is an inflation threshold beyond which the positive effect of finance on growth disappears or switches sign. The quantitative evidence confirms the expectation that such a threshold exists and shows that countries with inflation rates higher than the threshold experience slower growth because high inflation rates pull down the level of financial development. While Rousseau and Wachtel (2002) find this inflation threshold to be about 13–25 percent, others have found even lower thresholds (about 6–8 percent). Second, Cecchetti and Kharroubi (2012) estimate that if the financial sector represents more than 3.5 percent of total employment (i.e., employment in financial sector divided by total employment), further increases in financial sector depth are detrimental to economic growth. They find that growth in financial sector employment of about 1.6 percent per year reduces annual economic growth by about 1 percentage point.

Last but not least, heterogeneities in the finance-growth nexus are detected across time and regions. For instance, Rousseau and Wachtel (2011) find that a positive effect of finance on growth existed in the 1960–89 period (i.e., a similar period as in King and Levine [1993]) but not in the 1990–2004 period. Their explanation for this "fading link" is that the latter period was ridden with financial crises that pulled down the positive effect of finance on growth. Dabos and Gantman (2010) confirm these results using an extended sample and dynamic panel methods. The latest results are reported by Beck, Degryse, and Kneer (2013), who find evidence for this fading link in the 1995–2007 subsample. Consequently, although the recent papers have focused on shorter horizons and found evidence for a fading link between finance and growth, the positive association between finance and growth remains significant and positive in the long run.

In terms of regional variation, consider the evidence presented by Roubini and Sala-i-Martin (1992), who find that financial repression in Latin America explains the relatively slower growth performance over the 1960–85 period. De Gregorio and Guidotti (1995) find a different result in that banking sector deepening is negatively associated with economic growth in Latin America over the same period. Moreover, Barajas, Chami and Yousefi (2012) demonstrate that the effect of finance on growth in the Middle East and North Africa is lower than in comparable regions, even when the level of financial development is similar. They also find that the effect of finance on growth diminishes as the level of financial development increases, but at a faster rate for the Middle East and North Africa than for other regions.

2.2 Financial Stability and Economic Growth

A critical component of financial sector development is financial stability. Deepening the financial system without paying attention to potential negative consequences in the form of financial fragility is obviously suboptimal. Consequently, this section starts with the effect of financial liberalization on economic growth and then moves to the costs of such liberalization in terms of the incidence and severity of financial crisis. We conclude with the effects of regulation on economic growth because regulations are often the immediate responses to financial fragility. The aim of this section is to clarify whether the positive effects of finance on growth are worthwhile given the costs associated with financial fragility.[17]

We should note that there are differential effects on growth of capital account liberalization, equity market liberalization, and full-fledged financial liberalization that includes the former two and banking sector reforms. To capture financial liberalization, academics have come up with various indices based on specific reforms.[18] One clear message emanating from Table 7 in our inventory is that the magnitude of the effect of financial liberalization on economic growth is higher than the effects found in the previous subsections. Specifically, the effect of financial liberalization on economic growth reaches a more than 3 percentage point acceleration in the annual economic growth rate. As Bekaert, Harvey, and Lundblad (2005) demonstrate, however, the effect is higher for countries with good-quality institutions. In addition, the effect of equity market liberalization seems to have higher effects than capital account liberalization, which is usually associated with financial fragility, especially in developing countries. A very relevant article for the purposes of this section is presented by Tornell, Westermann, and Martinez (2004), who find that the effect of liberalization on growth is lower once financial fragility is accounted for. Nevertheless, they find that the net effect remains significantly positive and economically meaningful. Comparing India, an emerging

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[17] One could argue that the effect of financial liberalization on economic growth operates through each component of financial development (i.e., depth, stability, efficiency, and inclusion). We focus on financial liberalization in this section simply to bridge a number of strands in the literature. Otherwise, we have no intention to claim that financial liberalization breeds fragility. There is an established literature emphasizing the role of institutions in the success or failure of liberalization.

[18] Usually, authors refer to de facto or de jure financial liberalization. De facto financial liberalization is measured by gross capital flows as a share of GDP, as in Levchenko, Ranciere, and Thoenig (2009) and de jure financial liberalization refers to various indices constructed by authors based on policy reforms, as in Bakaert, Harvey, and Lundblad (2005).

market with a risk-averse attitude toward financial liberalization, with Thailand, a country that has gone through many booms and busts owing to fragility, they find that long-run growth increases by 0.54 percentage point in response to Thailand's pro-finance trajectory.

Nonetheless, the consequences of financial fragility on economic growth remain significantly negative. In terms of growth collapses, consider Loayza and Ranciere (2005), who estimate that an increase in financial volatility (frequency of systemic banking crisis) by one standard deviation leads to a decrease of 0.3 (0.7) percentage point in the annual growth rate of GDP per capita. Similarly, Ranciere, Tornell, and Westermann (2006) find that financial liberalization raises the probability of a twin crisis, thereby restraining economic growth. Bonfiglioli and Mendicino (2004) demonstrate that countries with nonsystemic banking crisis episodes grow 4 percent more than countries with systemic banking crisis. However, they find that countries with capital account restrictions are more exposed to the negative effects of banking crises than financially open economies. Johnston and Pazarbasioglu (1995) show that countries that reform their financial systems without experiencing banking crisis register higher average growth rates.

So far, we have ignored the potential of reverse causality in the relationship between financial stability and economic growth. Although the majority of the papers cited in our inventory look at the effect of financial fragility on economic growth and output, we understand that episodes of rapid growth may lead to instability. Even though we have not come across empirical papers studying this reversed link,[19] we understand that faster economic growth—especially in emerging markets—may lead to financial booms which, in the absence of good institutions and relevant regulations, can lead to financial fragility.

Table 8 in our inventory presents some quantified negative effects of financial, banking, and currency crises in terms of output losses in developed and developing countries.[20] One common message is that the costs of crises vary with the features of the crises and the profiles of the countries. For instance, as Cerra and Saxena (2008) show, while on average banking crises are more costly than currency crises, low-income countries experience the largest output losses relative to high-income countries from very frequent currency crises. By contrast, although countries with high levels of financial development experience higher costs, countries with better institutions experience lower costs. Historically, the largest output loss, about 29 percent, was recorded in the United States during the Great Depression, according to Reinhart and Rogoff (2009). Argentina follows, with 22 percent of GDP lost in 2001.[21]

The Basel Committee on Banking Supervision (2010) suggests that reducing crisis probability helps countries save a significant amount of their output. In this context, an

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[19] Some of the papers in our inventory on the growth-stability nexus recognize the potential of this reverse causality and address it with the use of dynamic panel data methods.

[20] If more country-specific examples are needed, one can easily access information on the quantified costs of crises.

[21] These are larger numbers than those listed in table 8. The difference derives from the way costs are computed. For instance, some compute the cumulative effect of crisis on output over the entire crisis period rather than focusing on the first year of crisis. Also, some focus on banking crisis and others on currency crisis.

immediate policy-relevant question is to what extent regulations and supervision, financial structure, and ownership can help mitigate the negative effects of crisis on economic growth. Even though we have not come across empirical studies that address this specific question, we report various estimates of the effects of regulations, financial structure, and ownership on economic growth in table 9 of our inventory. The first two papers relate to the effect of regulations on output. There is consensus that the higher the capital adequacy ratios, the lower the output. However, note that capital adequacy ratios can lower the crisis probability as well. Even though banking supervision seems not to be directly associated with economic growth, there is some evidence for indirect positive effects through financial stability.

Regarding financial structure and ownership, Fernandez, Gonzalez, and Suarez (2010) find that concentration in the banking system has negative effects on economic growth but that regulations in the form of activity restrictions lower the amplitude of these negative effects. In a seminal paper, La Porta, Lopez de Silanes, and Shleifer (2002) find that in developing countries there is a negative relationship between the extent of government ownership and economic growth. As Andrianova, Demetriades, and Shortland (2012) show, however, the earlier results are not robust to different specifications. Last but not least, regulations that ease the entry of foreign banks into the domestic market help improve economic growth through direct and indirect effects.[22]

2.3 Financial Efficiency and Inclusion and Economic Growth

In this section, we focus on the two remaining components of financial sector development, namely efficiency in the financial sector and access to finance, mostly by firms. As evident in tables 9 and 10 in our inventory, there is limited research on these two components. Partly, this lack of evidence is due to data availability, because the proxy variables used for efficiency and access are not readily available for many developing countries.[23]

For efficiency, the usual proxy variables include net interest margins between lending and deposit rates, overhead costs in proportion to total assets, noninterest income in proportion to total income, and various other indicators for profitability of banks, such as return on assets. Demirguc-Kunt, Levine, and Min (1998) find that a one standard deviation decrease in their efficiency proxy (i.e., overhead costs per total assets) raises economic growth by 1 percentage point. Koivu (2002) finds a similar effect (i.e., 1.2 percentage points) in response to a decrease in interest rate margins in a sample of transition economies.

For access, by contrast, researchers usually rely on the World Bank Enterprise Survey to capture financing constraints on firms. In addition, the penetration of banks and ATM

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[22] As will be discussed later, foreign bank entry is associated with higher efficiency in the banking sector, which is positively related to economic growth.

[23] The recently established Global Financial Database, however, offers a great opportunity for research, as it provides information on each component of financial sector development for 200 countries since the 1960s.

machines are used as proxies for access to finance by households. Access to finance has significant effects on economic growth. This is evident from the findings of the strand in the literature that conducts firm-level analysis. The main message is that access to finance is a robust determinant of firm growth that matters more for small firms than for larger firms. Beck and Levine (2005), however, find that as the level of financial development increases, the importance of financing constraints for small firms' growth decreases.

3. Finance and Employment

A clear finding of this literature review is that only a handful of articles focus on the effects of financial sector development on employment in developing countries. Even when the sample is expanded to developed countries, it is difficult to find empirical analyses that address this important nexus. Table 11 in our inventory for this subsection lists a few papers that focus on developing countries.

The seminal paper on the finance-employment nexus is the theoretical and empirical analyses conducted by Gine and Townsend (2004) in Thailand between 1976 and 1996. They provide convincing evidence that financial deepening helped a substantial part of the workforce move from the agriculture sector to formal labor markets in urban centers, thereby raising average household income 17–34 percent. In terms of the direct effect of financial depth on employment, consider the recent paper by Pagano and Pica (2012), who find a positive effect on the order of 0.23–0.83 percent increase in employment growth.[24] In terms of the effect of financial stability on employment, Reinhart and Rogoff (2009) estimate that banking crises increase unemployment rates by 7 percentage points and recovery to pre-crisis levels takes a long time. The record is again held by the United States during the Great Depression with a 20 percentage point increase in the unemployment rate. World Bank (2009) surveys some descriptive evidence on the rise of unemployment rates across the world after the global crisis. Last but not least, Choudry, Marelli, and Signorelli (2010) suggest that a 1 percent increase in the systemic crisis index lowers the employment rate by 0.394 percentage point. When their sample is restricted to only high- and upper-middle-income countries, they estimate the effects to be 1.32 and 1.01 percentage point decreases, respectively.

In terms of the effect of access to finance on employment, Aterido, Hallward-Driemeier, and Pages (2007) find that not only sophisticated but also simpler forms of finance have significant positive effects on employment growth. Aterido and Hallward-Driemeier (2010) document that access to finance is a crucial constraint for micro firms in Sub-Saharan Africa but surprisingly find that employment growth is not curtailed by financing constraints.[25] In Bangladesh, Rabbani and Suleiman (2005) evaluate the effectiveness of BRAC's small and medium-sized enterprise (SME) lending program from an

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[24] The lack of empirical analyses in this nexus is evident in the literature review section of this paper.

[25] Their explanation for this anomaly is the lack of competition and market access for micro firms. When they repeat the same exercise for countries outside Sub-Saharan Africa (e.g., comparable developing countries), they find that employment growth is curtailed by lack of access to finance.

employment perspective and find that SMEs that borrow repeatedly from BRAC manage to generate more employment.

The finance-growth nexus suggests that the growth effects of finance operate through either capital accumulation or productivity growth. The findings presented in this section provide yet another mechanism, employment growth. Unfortunately, this literature is still in its infancy and more research is necessary to test a variety of hypotheses using a multitude of empirical methodologies.

4. Determinants of Financial Sector Development

The preceding sections have shown that various components of financial sector development have significant positive effects on economic growth and employment. In this section, we are interested in distilling main messages from the established literature to answer a crucial question: what are the determinants of financial sector development in general and each component in particular? We restrict the aim of this section to gathering as much empirical evidence as possible that links *policy* variables to financial sector development. Within these policy variables, the focus is set primarily on regulations, supervision, and the enabling institutional environment. In setting this restriction, we refrain from investigating historical legal determinants over which policy makers have no control.[26]

As in Section 2, we investigate the determinants of financial sector development by focusing on a component in each of the following four subsections. Each subsection starts by discussing how regulations and supervision affect financial sector development and then moves to other determinants such as the institutional and legal environment (e.g., creditor protection and credit registries, among others) financial openness and banking reforms, financial structure (i.e., concentration and competition), ownership of banks (i.e., government or foreign ownership), and finally engagement with the World Bank and the International Monetary Fund. In table 13, panels A–E present empirical results for determinants of each component.

Before starting with the empirical evidence, some general remarks will be useful. First, it is only recently that academic researchers have managed to get their hands on data related to regulation and supervision. Although some papers use author-constructed indexes (e.g., compliance with the Basel Core Principles or Regulatory Governance Index based on Financial Sector Assessment Program), the majority of this literature relies on data collected by Barth, Caprio, and Levine (2000). The most recent literature review by Levine (2012) provides very important insights regarding the effects of regulatory framework on financial sector development. The common finding in the literature is that each component of financial sector development is positively related with the following key regulatory factors:

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[26] Note, however, that the institutional determinants listed later in this subsection are endogenous to legal origins. Beck, Demirguc-Kunt, and Levine (2001) offer an excellent review of legal theories and conduct empirical tests on various channels through which legal origins affect financial sector development. For a critical review of the literature, also see Beck and Levine (2005).

- Timely and easily accessible and comprehensible disclosure of information
- Equity and debt holders incentivized to oversee financial institutions[27]
- Removal of barriers to competition

James Barth, Gerard Caprio, and Ross Levine are the leading researchers on the effects of banking sector regulations and supervision on financial sector development, including financial depth, stability, and efficiency. They have collected data since the late 1990s and early 2000s from regulatory agencies across the world and compiled a very useful data set on the quantity and quality of regulations and supervision in a large sample of countries.[28] They have frequently published empirical analyses of the regulations-financial sector development nexus, and they confirm the insights listed above from Levine (2012). Another important insight from these authors is that for many developing countries, compliance with the Basel II accords—let alone Basel III—should not be a benchmark strategy as it is better for these countries first to develop their legal, information, and incentive systems and then think about specific regulations. The empirical evidence we cite below on the importance of institutions in financial sector development clearly supports this insight.

4.1 Financial Depth

In the finance-growth nexus, academic researchers often approximate the effect of financial depth on growth by using an exogenous increase in financial depth on the order of 10 percentage points or one standard deviation. A crucial question then is how countries can increase their financial depth.[29] This section surveys empirical literature that attempts to answer this important question. In general, the following key factors are found to be associated with financial depth:

- **Regulations and Supervision:** The key insight from the analyses of Barth, Caprio, and Levine is that certain regulations have either negative or no effects on financial deepening. For instance, restrictions on commercial bank activity reduce financial depth, but capital requirements have no significant effect. Although official supervision increases financial depth, this positive effect exists only in countries with a high level of political openness.[30] This result holds only in countries with no government presence in the financial sector. Detragiache, Gupta, and Tressel (2008) complement Barth, Caprio, and Levine (2004, 2012) in that they also find that more stringent regulatory and supervisory requirements[31]

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[27] In other words, as Barth et al. (2009) argue, private supervisory systems are more optimal than official supervisory power, especially in countries with greater voice and accountability.

[28] These authors collect data on a variety of regulations such as capital and disclosure requirements, and regulations that restrict commercial banks from engaging in securities, insurance, and real estate activities and from mixing with nonfinancial firms.

[29] As a reminder, financial depth—or, more correctly, intermediation—is often measured by credit from banks to the private sector divided by GDP. A few papers listed in this section look at stock market depth as well.

[30] One mechanism that comes to mind is that in such countries, the expansion of the official supervisory branch is not subject to corruption.

[31] In this article, regulations and supervision are measured by accounting, discipline and disclosure, restrictions on banking activities, audit requirements, and deposit insurance.

reduce financial depth. In addition, explicit deposit insurance schemes reduce financial depth.

- **Regulatory Reforms:** Giustiniani and Kronenberg (2005) find that compliance with conditionalities imposed by the International Monetary Fund (IMF) increases the level and growth of financial depth. However, the intensity and hardness of the conditionalities are not associated with better banking performance. Cull and Effron (2005) find that countries that borrowed adjustment loans from the World Bank for reforms related to regulation and supervision experienced faster growth in liquid liabilities but slower growth in the ratio of private credit to GDP. Moreover, Detragiache and Tressel (2008) construct an aggregate index of banking sector reform[32] and find that banking sector reforms are associated with large, positive, and long-lasting effects on banking sector depth.[33]

- **Financial Openness:** Chinn and Ito (2002, 2006) and Ito (2006) look at the relationship between financial openness (i.e., capital account openness) and stock market liquidity. They find that more open financial systems are also more active and developed. An important caveat is that this relationship works more robustly and significantly for countries with better institutions. Bonfiglioli and Mendicino (2004) focus on banking sector development and find that countries with open capital accounts have deeper financial sectors.

- **Ownership:** La Porta, Lopez de Silanes, and Shleifer (2002) find that the higher the share of assets owned by government banks, the less deep the financial sector. In low-income countries Detragiache, Gupta, and Tressel (2008) find that the larger the foreign presence in the banking system, the less deep the banking sector.

- **Institutions:** Institutions are crucial for determinants of financial sector depth. Djankov, McLiesh, and Shleifer (2007) refer to creditor protection and information sharing.[34] Essentially, creditors that know that they are protected in case of default, to a certain extent, are willing to extend more credit to enterprises. Also, having access to information regarding the financial history of firms and households helps contain the negative effects of asymmetric information and moral hazard.

  - **Creditor Rights:** Levine (1998) considers the effect of creditor rights,[35] contract enforcement, and rule of law on banking sector depth and finds that an increase of one standard deviation in both creditor rights and

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[32] This index is based on credit controls, reserve requirements, interest rate controls, entry barriers, state ownership, and banking supervision.

[33] Specifically, removing restrictions on credit allocation, lowering reserve requirements, removing limits on credit growth, facilitating entry into the banking system, and removing branching restrictions all increase banking sector depth. They do not find any evidence for positive effects of improvements in banking regulation and supervision.

[34] These two are not mutually exclusive, as they might be substitutes in certain contexts.

[35] He measures creditor rights as having an automatic stay on the assets of the firm upon filing a reorganization petition, whether the firm continues to manage its property pending the resolution of the reorganization process, and whether secured creditors rank first in the distribution of the proceeds. For enforcement, he considers the International Country Risk Guide (ICRG) law-and-order risk component, the risk that government will and can modify a contract after it has been signed.

contract enforcement leads to a sizable (0.45 percentage point) increase in financial depth.

- o **Credit Registries:** The seminal work by Japelli and Pagano (2002) finds that countries with information-sharing credit bureaus have financial depth 20 percentage points higher than those without any such institutions. In addition, they find that former countries have lower credit risk which in turn is positively associated with nonperforming loans (NPLs). Djankov, McLiesh, and Shleifer (2007) provide more robust empirical evidence on both hypotheses with a larger data set of 129 countries over 25 years.

- o **Accounting Standards:** [36] Levine, Loayza, and Beck (2000) find that accounting standards explain a large portion of the variation in financial depth across countries. For instance, if Uruguay could push its accounting standards to the level of Chile's, then Uruguay could enjoy greater banking sector depth than Chile.

Consequently, the coefficient estimates suggest that the effect of institutional factors can help countries achieve significant financial deepening which, as reported in section 2, leads to higher economic growth. The effect of regulations on financial sector depth is less pronounced, given that there is no relationship between capital requirements and official supervision on one hand, and financial depth on the other, while activity restrictions curtail financial deepening. Nevertheless, intense banking sector reforms seem to be strongly and significantly associated with financial depth, giving legitimacy to engagements with international organizations to pursue further reforms to strengthen financial sectors.

4.2 Financial Stability

In the finance-growth nexus, financial stability is the second most frequently used indicator of financial sector development. Earlier, we discussed the findings of the literature, suggesting that financial fragility has significant negative effects on economic growth and output. This section attempts to identify a list of factors that are found to be robust determinants of financial stability. Our inventory offers quantitative effects of the following key determinants on financial stability. [37]

- **Regulations and Supervision**

  - **Capital Requirements and Activity Restrictions:** Barth, Caprio, and Levine (2012) find that capital requirements are associated with lower NPLs but this association disappears when government banks are considered. The Basel Committee on Banking Supervision (2010) argues that introducing Basel III is

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[36] Accounting standards are measured by an index that ranks the comprehensiveness of company reports.

[37] The literature usually uses NPL ratios as well as the probability of crisis to measure financial stability. In addition, various indices are constructed for financial soundness (either individual bank level or systemic) based on NPL, capital adequacy ratios, and Moody's z-scores for banks.

expected to lower the probability and severity of crisis.[38] Angkinand (2009) suggests that raising capital requirements reduces the severity of financial crisis, while raising activity restrictions increases the output cost of crises, except in countries with a precrisis credit boom. Schaeck, Cihak, and Wolfe (2009) fail to find a significant effect of various regulations on the timing of the crisis but they suggest that activity restrictions significantly increase crisis probability. A complementary finding is presented by Bystrom (2004), who argues that restrictive regulations are positively related to banking sector fragility as perceived by the market before the crisis.

- **Supervision:** According to de Haan and Shehzad (2009), better supervision reduces the positive effect of financial liberalization on financial fragility, especially after interest rate liberalization. Their findings are quite important because while they observe that non-OECD countries have closed the gap with OECD countries in terms of financial openness in the past decade, the former group has not taken sufficient steps to improve supervision of their financial systems.[39] Barth, Caprio, and Levine (2012) argue that supervision by shareholders and creditors is more effective than official supervision when it comes to reducing financial fragility. Specifically, while they find no relationship between official supervision and financial stability, they find that private monitoring exerts a larger negative effect on financial fragility than capital requirements.

- **Compliance with Basel Core Principles:** Sundararajan, Marston, and Basu (2001); Demirguc-Kunt, Detragiache, and Tressel (2008); and Podpiera (2006) question whether compliance with Basel Core Principles help countries improve financial stability. Whereas Sundararajan, Marston, and Basu find no significant association between the two,[40] Demirguc-Kunt, Detragiache, and Tressel find that moving from largely compliant status to materially noncompliant status lowers banks' soundness. They argue that among the Basel Core Principles, the ones that matter most for financial stability are entry barriers and disclosure requirements.[41] Das, Quintyn, and Chenard (2004) use a different measure for regulations based on Financial Sector Assessment Program (i.e., regulatory governance index) and find that countries that score higher values in this index have more sound financial systems. They also argue that the strength of this relationship is conditional on the overall quality of public sector governance. Last but not least, Papi, Presbitero, and Zazzaro (2012) find that countries that signed an IMF

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[38] However, they note an important nonlinearity. For instance, raising the capital ratio from 7 percent to 8 percent reduces the banking crisis probability by 1.6 percentage points, but raising the capital ratio from 10 percent to 11 percent is not nearly as effective in reducing crisis probability. Because raising capital adequacy ratios also decreases output, a trade-off exists, and the authors do not recommend raising the requirements more than necessary.

[39] In a related manner, Barth, Caprio, and Levine (2013) argue that regulatory and supervisory approach to banking system has not converged across countries over time.

[40] Note that Sundararajan, Marston, and Basu (2001) detect a statistically significant association between the Basel Core Principles and financial stability in countries with high loan growth rates. Demirguc-Kunt and Detragiache (2011) confirm these results

[41] In this context, an interesting study by Cihak and Podpiera (2006) show that having a fully integrated supervisory approach to financial system helps countries comply more with the Basel Core Principles and have more effective supervision of not only banking sector but also capital markets and contractual investors.

lending agreement and complied with the conditionalities on financial sector reform enjoy an 18.9 percent lower probability of banking crisis.

- **Explicit Deposit Insurance Schemes**: Demirguc-Kunt and Detragiache (2002) argue that the larger the coverage of the deposit insurance scheme, the higher the probability of banking crisis. They find significant reductions in the probability of crisis for a variety of countries, had these countries reduced the extent of the deposit insurance to that of Switzerland. Angkinand (2009), however, demonstrates that deposit insurance schemes are associated with lower output costs of financial crises. Bystrom (2004) also finds some evidence that deposit insurance schemes are associated with a lower probability of banking failure.

Let us conclude the discussion of the role of regulations and supervision on financial stability by reviewing the findings of a recent paper by Cihak et al. (2012), who compare 21 crisis and 122 noncrisis countries based on their own categorization with respect to the recent global financial crisis. They find that crisis countries had less stringent capital requirements and activity restrictions on banks. In addition, bad loans were treated less strictly in crisis countries with weaker incentives for private monitoring of banks and more extensive deposit insurance schemes. Our reading of the literature provides additional conclusions. Although activity restrictions and deposit insurance schemes increase financial fragility, regulations and supervision are effective tools for containing fragility in the aftermath of financial liberalization.

- **Banking Structure and Ownership**

  - **Ownership**: Whereas the presence of foreign banks in domestic banking sector is associated with a lower probability of crisis, the extent of government ownership is associated with a higher probability of crisis. For instance, according to the coefficient estimates from La Porta, Lopez de Silanes, and Shleifer (2002), moving from the average share of government ownership of assets in the banking sector in countries with French legal origin to the share in those with British legal origin (i.e., about a 30 percent decrease) raises the stability index by 38 percent. As for foreign ownership, Yeyati and Micco (2007) find that increasing the share of assets held by foreign banks reduces the probability of systemic crisis by about 3.5 percent. The suggested mechanism is that the entry of foreign banks raises the degree of product differentiation in the sector, which then reduces competition, yielding higher profits and a higher charter value of banks and hence less appetite for risk taking. Gonzalez (2005) confirms the latter relationship, finding that the higher the charter value of a bank, the less risk the bank would take. Interestingly, he also finds that bank charter values are lower in countries with more extensive deposit insurance and stronger regulations.

  - **Concentration and Competition:** The focus on charter values of banks brings us to the important role of banking structure in financial stability.

The relevant question in this context is whether more concentrated and less competitive banking systems perform better than others in terms of financial stability. Beck (2008) provides an excellent review of the relevant theoretical and empirical literature and distills the following key messages:

- The existing literature has so far mistakenly associated the notion of concentration with competition. The proxies for these two phenomena yield different results for stability.[42]
- Related to this point, although the literature on the concentration-stability hypothesis finds mixed results, the effect of competition on stability is considered positive.[43]
- The enabling institutional environment is crucial for the positive effect of competition on stability. Hence, the policy course is to enhance the institutional environment while maintaining the competitiveness of the financial system.

The mixed results on the concentration-stability hypothesis are evident in our inventory. For instance, Beck, Demirguc-Kunt, and Levine (2006b) find statistically significant and economically large positive effects of concentration on stability.[44] Boyd, de Nicolo, and Jalal (2006), however, show that more concentrated systems are more likely to incur banking failures. Noy (2004) argues in favor of a similar mechanism, in that financial liberalization lowers the monopoly power of incumbent banks and encourages them to take excessive risks. He finds, however, that better supervision during financial liberalization leads to a lower probability of banking crisis.[45]

4.3 Financial Efficiency

Intuitively, we expect that a deep and stable financial sector is likely to be an efficient one, even though this survey has not found a formal test of this statement. We find that the determinants of financial efficiency are not different than the determinants of other aspects of financial sector development. Our inventory offers findings on the quantitative effects of the following key determinants on financial efficiency:[46]

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[42] See Beck, Demirguc-Kunt, and Levine (2006a), who show that bank concentration is not a good indicator of lack of competition.

[43] See Schaeck, Cihak, and Wolfe (2009), who argue that more competitive banking systems are associated with a lower probability of banking crisis.

[44] In addition, they demonstrate negative effects of various regulatory restrictions (e.g., entry barriers and activity restrictions) on banking stability. Interestingly, they also find that more banking freedom and more economically competitive environments are less likely to experience banking crisis. A better institutional environment (proxied by the World Bank's World Governance Indicators) is associated with a lower probability of systemic crisis.

[45] We refrain from digging deeper into the reasons for the mixed results in this nexus but our understanding from Beck (2008) is that results are not robust to the use of different proxies for financial stability (e.g., individual bank level or systemic risk).

[46] The common trend in the literature is to measure financial efficiency by net interest margins between lending and deposit rates, overhead costs in proportion to total assets, noninterest income in proportion to total income, and various other indicators for profitability of banks such as return on assets

- **Regulations**
  - **Capital Requirements and Activity Restrictions:** Demirguc-Kunt, Laeven, and Levine (2004) find that various regulatory indicators [47] increase net interest margins, thereby decreasing financial efficiency. However, once institutional quality is accounted for, regulations cease to have a significant impact. In fact, they find that what essentially matters for financial efficiency is the quality of the institutional environment as proxied by the Economic Freedom Index of the Heritage Foundation or the World Governance Index of the World Bank.

  - **Supervision:** Barth, Caprio, and Levine (2012) find that the private monitoring index reduces overhead costs and net interest margins, while official supervision is not significantly related to financial efficiency. However, Podpiera (2006) finds that compliance with the Basel Core Principles lowers the net interest margins in a statistically significant fashion. In addition, Pasiouras, Tanna, and Zopounidis (2009) find that capital requirements, market discipline, and official supervisory power are negatively associated with cost and profit inefficiency.

  - **Regulatory Reforms:** Giustiniani and Kronenberg (2005) and Cull and Effron (2005) examine whether financial sector development is tangibly affected by support from international organizations such as the World Bank or the IMF for financial sector reforms in favor of better regulations and supervision. While the former finds that IMF conditionalities on banking sector reform have a positive effect on banking sector performance (i.e., return on assets), the latter finds that countries that did not borrow from the World Bank for regulatory reforms experienced larger increases in interest margins than countries that did borrow for this purpose.

- **Banking Structure and Ownership**

  - **Concentration:** Demirguc-Kunt, Laeven, and Levine (2004) find that more concentrated banking systems happen to be more inefficient ones as well. Whereas Martinez Peria and Mody (2004) find that higher concentration raises bank spreads and administrative costs, Detragiache, Gupta, and Tressel (2005) find evidence for the contrary in developing countries.

  - **Foreign Ownership:** Table 13, Panel C, in our inventory suggests that the literature on the determinants of financial efficiency is dominated by ownership patterns. While the penetration of domestic banking system by foreign banks is estimated to increase financial efficiency in the entire

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[47] Among others, they focus on fraction of entry denied, activity restrictions, and reserve requirements.

sector, there is also some evidence on negative effects of government ownership. Demirguc-Kunt and Detragiache (1997); Denizer (2000); Barajas, Steiner, and Salazar (2000); Claessens, Demirguc-Kunt, and Huizinga (2001); Martinez Peria and Mody (2004); Bayraktar and Wang (2004); and Haber and Musacchio (2012) find similar results in terms of the positive effects of the presence of foreign banks on financial efficiency measured by reductions in profitability, net interest margins, and overhead costs, among others. [48] Among the various reasons for these effects, Claessens, Demirguc-Kunt, and Huizinga (2001, 892) suggest that foreign entry may "(i) improve the quality and availability of financial services in the domestic financial market by increasing bank competition, and enabling the greater application of more modern banking skills and technology, (ii) serve to stimulate the development of the underlying bank supervisory and legal framework, and (iii) enhance a country access to international capital." For instance, Denizer (2000) provides some anecdotal evidence from Turkey, where penetration of foreign banks increased the level and use of technology in the sector and attracted a more qualified workforce. Bhattacharya (1993) notes that various fees in the banking system decreased significantly after foreign entry in Turkey.

- o **Government Ownership:** In contrast to foreign ownership, the extent of government ownership in the financial sector is associated with lower efficiency. La Porta, Lopez de Silanes, and Shleifer (2002) find that overhead costs and net interest margins increase in response to an increase in government ownership. Mian (2003) and Micco and Panizza (2006) also confirm that government banks are less efficient than their foreign and private domestic counterparts, more likely to be bailed out, and have excessive employment.

4.4 Financial Inclusion

Financial inclusion is a key component of financial sector development. Even though the effect of financial inclusion on economic growth is not as heavily scrutinized as the effects of financial depth or stability, it is crucial to survey the determinants of financial inclusion, as there are many financially constrained firms and households across the world. Our inventory offers evidence for the quantitative effects of the following key determinants of financial inclusion:

- • **Regulations**

   - o **Entry Barriers and Activity Restrictions:** According to Barth et al. (2009), entry restrictions in the banking system raise the probability of firms reporting bank corruption as a major obstacle. Disclosure and

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[48] An interesting insight from this literature is that whereas foreign banks have lower interest margins, overhead expenses, and profitability in developed countries, the opposite holds in developing countries.

auditing requirements lower bank corruption and ease firms financing constraints. Beck, Demirguc-Kunt, and Maksimovic (2004) suggest that the probability of firms reporting finance as a major obstacle increases with the intensity of the activity restrictions.[49]

- o **Supervision:** According to Cull, Demirguc-Kunt, and Morduch (2011), the cost of compliance with regulations in the form of adapting to regular on-site supervision leads micro-finance institutions to curtail their outreach so as to maintain financial self-sufficiency. As Beck, Demirguc-Kunt, and Levine (2011) demonstrate however, supervision in the form of private monitoring improves firms' access to finance.

- o **Deposit Insurance:** While Barth et al. (2009) find that the existence of deposit insurance schemes raise the probability that a firm will report bank corruption as a major obstacle to its growth, Allen et al. (2012) show that the probability of households owning and using a bank account increases with the coverage of the deposit insurance schemes.

- • **Institutions**

  - o **Creditor Rights and Credit Registries:** Institutions matter for increasing firms' and households' access to finance, as they lower the monitoring costs incurred by formal financial institutions. Galindo and Micco (2005) find that the higher the creditor rights, the easier the access of small firms to finance. Beck, Demirguc-Kunt, and Martinez Peria (2007) find that the higher the credit information index, the higher the penetration of bank branches across the country. Barth et al. (2009) similarly argue that the existence of private credit bureaus lowers corruption in lending but that public credit bureaus have no significant association. An important distinction emphasized by Love and Mylenko (2003) is that while public registries may be associated with financial depth, they are less likely to be associated with access to finance. In their empirical study, they confirm this hypothesis and find a negative association between the presence of private credit registries and financing constraints perceived by firms. Brown, Jappelli, and Pagano (2009) study a similar hypothesis using firm-level panel data covering transition countries and present more robust results. They document positive and significant effects of information sharing on access to finance, but this effect is more pronounced for opaque firms and countries with weaker protection of creditor rights.

  - o **Bank Branch and ATM Penetration:** Allen et al. (2012) and Beck, Demirguc-Kunt, and Martinez Peria (2007) study the impact of distance barriers and pro-access policies on the probability of households owning a bank account and firm managers reporting finance as an obstacle to firm

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[49] Not only firms but also households are negatively affected by activity restrictions.

growth. Both studies identify the crucial positive impacts of bank branch and ATM penetration on access to finance for firms and households. In addition, Allen et al. (2012) consider various pro-access policies[50] that lower the negative perceptions associated with opening and using a bank account. For instance, they find that the probability of using bank accounts is three times higher in countries where the government makes payments through bank accounts as well as in countries where savings schemes and tax incentive programs are established.

- **Banking Structure and Ownership**

  - **Concentration:** Beck, Demirguc-Kunt, and Maksimovic (2004) find that higher concentration in the banking sector raises the probability that firms report financing as a major obstacle, especially for small firms. Yet they emphasize that this relationship is subject to various nonlinearities. For instance, the negative effect of concentration on access to finance is more prominent in low-income countries and in countries with a weak institutional environment. They also suggest that the existence of credit registries lowers the negative effect of concentration on firms' access to finance. Barth et al. (2009) finds a complementary result in that as banking concentration increases, the probability that a firm rates bank corruption as a major obstacle to its growth increases significantly.

  - **Government versus Foreign Ownership:** La Porta, Lopez de Silanes, and Shleifer (2002) find that countries with a higher government stake in the banking sector provide more restrictive access to finance (i.e., exclusive access to top-ranking firms). Detragiache, Gupta, and Tressel (2008), however, suggest that in low-income countries, the larger the share of foreign bank assets, the lower the number of bank branches and ATMs, loans, and deposits per capita. Gormley (2007) confirms this result and suggests that because of information costs the clientele of foreign banks is restricted to firms that are located at the top of the distribution of firms in terms of their profitability. From a different perspective, Clarke, Cull, and Martinez Peria (2006) find that increasing the share of foreign banks in a country leads to reductions in the negative perceptions of managers about firms' access to finance (e.g., interest rate and long-term financing opportunities) and that this result applies to firms of all sizes. Barth et al. (2009) also argue that greater private or foreign ownership reduces bank corruption, which is a key constraint for firms.

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[50] Among others, they consider policies that require banks to offer basic or low-fee accounts, exempt some depositors from costly documentation requirements, and use bank accounts to make government payments.

5. Causes and Consequences of Insurance and Pension Sector Development

Initially, the aim of this section was to present a list of academic articles that study the determinants of insurance and pension sector development. Unfortunately, this literature is in its infancy. Apart from Beck and Webb (2003) and Feyen, Lester, and Rocha (2011), this survey could not find any papers that examine the regulatory and institutional determinants of the development of the pension and insurance sectors. In fact, these two papers focus only on the insurance sector, leaving the pension sector unexplored. Table 14 in our inventory, therefore, presents only five papers that examine the effect of pension sector development on banking sector and capital market development.

Focusing on the insurance sector first, the recent paper by Feyen, Lester, and Rocha (2011) examines the factors associated with life insurance market activity. They find that life insurance markets are more active and developed in countries with better institutions (e.g., creditor rights) and a well-developed banking sector. In addition, they find that insurance sectors that are less concentrated and that are dominated by the private sector are more active than those that are more concentrated and dominated by the public sector. Beck and Webb (2003) argue that countries with more developed banking sectors and better institutions have larger insurance sectors. They also suggest that life insurance and other forms of contractual savings might foster the development of capital markets through demand for long-term financial investment. In fact, the remaining articles in table 14 provide evidence for this link but use contractual investors as a proxy for pension funds. More specifically, they consider the aftermath of pension reforms that result in significant increases in the ratio of pension assets to GDP. For instance, Davis (2000) draws attention to the significant increases in the pension sector in Chile and Malaysia in the aftermath of pension reforms toward funded systems. For more specific mechanisms on the relationship between pension reforms and economic growth through capital market development, see Davis (2000), Meng and Pfau (2010), and Hu (2005).

Impavido, Musalem, and Tressel (2003) find a positive effect of pension sector development (i.e., proxied as the share of pension assets in total financial assets) on stock and bond market capitalization but not on stock market liquidity. They find the effects to be larger in countries with mandatory pension systems. Hu (2005, 2012) also finds a positive and significant effect of pension sector development on stock market capitalization as well as on stock market liquidity. Meng and Pfau (2010) find similar results but also detect the effect to be nonlinear, conditional on the level of overall financial development. Last but not least, Walker and Lefort (2002) study indirect effects of pension sector development on capital markets. Specifically, they find that the more developed the pension sector, the lower the cost of capital and market volatility.

6. Conclusion and Ideas for Future Work

More than 180 papers have been surveyed for this literature review to get a glimpse of the quantitative findings of various strands of a giant literature. Leaving the demanding econometric qualifications aside, the following points can provide helpful insights for policy making:

- **Finance-Growth Nexus:** Financial sector depth has a statistically significant and economically meaningful positive effect on economic growth. The magnitude of this effect can be quantified as an acceleration of about 1 percentage point in annual growth of real GDP per capita, when banking sector depth is considered. Larger effects are detected for stock market development and financial liberalization. In addition, contractual savings institutions have positive effects on economic growth. However, the positive effect of finance on growth is sensitive to various forms of thresholds such as level of income, financial development, and inflation and varies across regions and periods. Furthermore, a stable, efficient, and inclusive financial system contributes positively to economic growth.

- **Finance-Employment Nexus:** Financial sector depth has a statistically significant positive effect on employment. Whereas financial fragility is associated with higher unemployment, easing firms' access to finance contributes positively to employment growth. Unfortunately, these conclusions derive from only a few papers that have not scrutinized this relationship as much as papers have examined the finance-growth nexus.

- **Determinants of Finance**: Our reading of the literature suggests that institutions (e.g., creditor rights, credit registries, and accounting standards) are crucial for each component of financial sector development. However, only some types of regulations and supervision are positively related to financial sector development (i.e., timely and easily accessible and comprehensible disclosure of information, removal of barriers to entry into the financial system, less extensive deposit insurance schemes, and fewer activity restrictions). While the extent of government ownership is associated with less deep, inefficient, and unstable financial systems, the opposite holds for the extent of foreign ownership. Last, the effect of concentration in the financial system on financial sector development is not yet resolved but there is strong evidence for positive effects of competition.

A definitive conclusion of this synthesis paper is that there is room for further work. First, as we have mentioned throughout the text, quite a few empirical weaknesses in the literature could be circumvented with the use of a larger empirical toolbox and alternative data sets. Cutting-edge econometric methodologies can be applied to improve the robustness of the results, especially in the relationship between regulations and financial stability.

Second, a "perfect" paper that caters to the specific questions raised in the beginning of this survey does not yet exist. For instance, we still do not know the quantitative effects

of overall financial sector development on economic growth. To gain rich insights for policy design, knowing how each component of financial sector development is associated with economic growth should indeed be the ultimate aim. That said, what about a measure of financial development that varies across countries and time and that incorporates each component of financial sector development? To our knowledge, no such statistic exists. In a related manner, we still do not know how the various policies discussed in Section 4 could affect economic growth through their effect on financial sector development. Addressing this gap would require a system-of-equations approach that could link the two questions we raised originally.

Third, a variety of research questions can be answered within the finance-employment nexus. In essence, whatever is researched in the finance-growth nexus can essentially be studied within the finance-employment nexus.

We hope to address these issues in our future work and contribute to this giant literature with further empirical evidence, specifically from developing countries.

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Appendix

Table 1. Finance-Growth Nexus: Banking Sector Depth	
References	**Empirical Findings**
King and Levine (1993)	• As the authors interpret, if in 1970 Zaire had increased the share of domestic credit allocated by banks (as opposed to the central bank) from 26 percent to the mean value for developing countries at that time (57 percent), Zaire would have grown 0.9 percent faster each year in the 1980s and by the end of 1980s, real GDP per capita would have been about 9 percent larger. • Between 1960 and 1990, the growth rate of real GDP per capita would have accelerated by 1 percent per year if the ratio of liquid liabilities to GDP was pushed from the mean of the slowest-growing countries to the mean of the fastest-growing countries. • As Levine (2005) interprets, an exogenous increase in financial depth in Bolivia in 1960 of 13 percent would have accelerated GDP growth 0.4 percent more and helped Bolivia achieve an increase of 13 percent in real GDP per capita in 1990. • On average, a 28 percentage point increase in financial development leads to a 1 percent increase in the annual rate of average GDP growth.
Levine (1998)	• This is an ideal paper for our purposes. The author finds that increasing creditor rights and enforcement by one standard deviation would raise financial depth by 0.45 percentage points, which then would accelerate the growth rate of GDP per capita by 2 percent per year. By the end of the 18-year sample period, the real GDP per capita would be close to 40 percent higher than it actually was.
Levine and Zervos (1998)	• The authors compute that a one standard deviation increase in financial depth (0.5 percentage point) would increase growth by 0.7 percentage point per year. Consider a country-specific example: If Mexico had had the sample mean value of banking development in 1976 (0.65), instead of its actual value (0.13), the growth rate would have been 0.8 percentage points faster per year.
Loayza and Ranciere (2005)	• An increase in financial depth by one standard deviation increases economic growth by 0.9 percentage point. If a country moves from the 25th to 50th percentile in the distribution of financial depth (i.e., 11 percentage points), the GDP growth rate would increase by 1.45 percentage points.
Levine et al. (2000)	• As Levine (2005) interprets, consider an exogenous increase in financial depth in India by about 5 percent toward the sample mean of developing countries. This scenario would accelerate economic growth by an additional 0.6 percentage point annually. Consider Argentina under the same scenario (i.e., a 9 percent increase in financial depth). Such an increase would have incredible effects (i.e., over 1 percentage point acceleration of the economic growth rate) especially given that the average economic growth rate in Argentina was about 1.8 percent in the sample period.
Beck, Levine, and Loayza (2000)	• As Levine (2005) interprets, an exogenous increase in financial depth in Mexico on the order of about 5 percent, which would move Mexico to the sample median value of financial depth, would increase economic growth rate by 0.4 percentage point per year.
Benhabib and Spiegel (2000)	• Authors argue that a one standard deviation increase in financial development raises annual growth by between 0.5 and 0.7 percent.

De Gregorio and Guidotti (1995)	• A 10 percent increase in the banking sector development proxy leads to an increase of 0.44 percentage points in average growth of real GDP per capita. In Latin America, however, the same scenario leads to a reduction in growth rate of 0.92 percentage points.
Beck and Levine (2004)	• As the authors interpret, moving Mexico's financial depth (16 percent) to the average of all OECD countries (71 percent) would accelerate economic growth by 2.6 percentage points annually. Similarly, an improvement of Egypt's financial depth (24 percent) to the sample mean of 44 percent would have accelerated economic growth by 0.7 percentage point annually over the period of 1975–98.
Wachtel (2003)	• A 10 percentage point increase in the ratio of private credit to GDP from its mean of 27.5 percent results in an increase in the annual growth of 0.69 percent within the cross-section and 0.74 percent within the panel. More conservative specification finds the range as 0.5 to 1 percent. • A 10 percentage point increase in the ratio of broad money to GDP, particularly in countries without high inflation, increases the rate of growth by between 0.6 and 1 percentage point a year. Accumulating over five years, real GDP would have been between 3 and 5 percent higher. With panel vector auto-regression, estimates indicate that the same scenario raises output per capita over five years by 4.1 percent, or 0.8 percent per year.
Rousseau and Yilmazkuday (2009)	• While a 10 percent increase in the ratio of liquid liabilities to GDP leads to a 0.42 percentage point increase in economic growth in the 1960–89 period, there is no significant association between the two in the 1990–2004 period. • The effect of finance on growth during a major crisis is 0.17 percentage point less than during noncrisis periods. This negative effect is smaller but still significant for minor crises. Essentially, the effect of finance on growth is pulled down by the incidence of crisis.
Hasan, Wachtel, and Zhou (2009)	• A one percentage point increase in a financial development indicator accelerates GDP growth by 0.4 to 0.6 percentage points.
Favarra (2003)	• If Argentina's ratio of private credit to GDP was at the sample mean during the period of 1996–98 (48 percent) rather than at 21 percent, Argentina's economy would have grown 0.35 percent faster per year, leading to close to 7 percent larger GDP per capita in the long run.
Cojocaru, Hoffman, and Miller (2011)	• If Romania's ratio of private credit to GDP in 2008 were 108 percent of GDP (the same as that of France) instead of 38.5 percent, Romania's economic growth rate would have been 3.26 percent faster per year.
Hassan, Sanchez, and Yu (2011)	• In South Asia, a 1 percent increase in gross domestic savings results in a 2.35 percent increase in growth. In East Asia, a 1 percent increase in domestic credit by banks leads to a 1.20 percent increase in growth. In Latin America, this effect is lower, at 0.68 percent. • A 1 percent increase in M3/GDP leads to a 3.22 percent decrease in the growth rate in East Asia and the Pacific and a 0.61 percent decrease in Sub-Saharan Africa.
Becchetti and Ciampoli (2012)	• The authors find that a 100 percent increase in bank assets is associated with a 2–3 percent decrease in growth rate. They include a postcrisis dummy and find 2 percent less economic growth relative to the precrisis period. This negative growth effect is larger in the second specification (i.e., 6–8 percent with a postcrisis dummy of 4–7 percent). The OTC has a positive effect on growth, but the magnitude is limited, with an elasticity of less than 1 percent.

Shen and Lee (2006)	• A 10 percentage point increase in the ratio of private credit to GDP leads to a 0.5 percent decrease in GDP per capita growth. The negative effect of banking sector development is mitigated in financially liberalized, high-income countries with good shareholder protection and lower corruption. However, the negative effects are worsened in a middle-income country; in regions of Latin American, Sub-Saharan Africa, and East Asia; in a country suffering from banking and currency crises; and in a country with bad creditor protection.
Nazmi (2005)	• Financial development as measured by the ratio of liquid liabilities to GDP has a positive and highly significant impact on the ratio of investment to GDP. In response to a 1 percent increase in financial development, this ratio increases by 0.4 percent. Also, higher inflation is detrimental to the ratio.
Beck, et al. (2013)	• A one standard deviation increase in financial intermediation leads to, on average, a 0.6 percentage point increase in economic growth.
Greenwood, Sanchez, and Wang (2013)	• In their calibration, the authors find that if Uganda had the best practices in the financial sector, like those in Luxembourg, then Ugandan output could increase by 116 percent.

Table 2. Finance-Growth Nexus: Country Studies	
References	**Empirical Findings**
Hao (2006)	• Over the period 1997–99, the value of Hubei province's loan-to-budget ratio was 2.34, while the mean value for the country was 5.52. Therefore, if exogenous factors had pushed Hubei province's ratio to the country's mean, Hubei province would have grown by an additional 2.29 percentage points per year during this period. • Similarly, if the savings ratio for the province had been at the mean value for the country (0.66) instead of the actual 0.43, it would have grown 2.19 percentage points faster per year during this period.
Anwar and Nguyen (2011)	• A 10 percentage point increase in the ratio of private credit to GDP in Vietnam raises the real GDP growth rate (per province) by 18.3 percent. Vietnam's credit-to-GDP ratio stood at about 20 percent as of 1997, so a 10 percent change is not an easy achievement. This is interesting also because over the sample period Vietnam passed the inflation thresholds estimated from cross-country regressions.
Kendall (2011)	• For Indian districts in the sample, moving from the 75th percentile of the ratio of credit to net domestic product to the 25th percentile (about a 7 percentage point decrease in the ratio) implies an average loss of 4 percent in growth over the 1990s. Over the sample period, India passed the inflation thresholds estimated from cross-country regressions.
Hasan, Wachtel, and Zhou (2009)	• In China, a 10 percentage point increase in a financial development indicator accelerates GDP growth by 4 to 6 percentage points.
Zhang, Wang, and Wang (2012)	• In China, if a city exogenously moves from the 25th percentile in the distribution of the ratio of total loans to GDP (53.96 percent) to the 75th percentile (92.99 percent), it will have a 2.01 percent larger rate of GDP growth.
Liang (2011)	• The effect of financial sector development on economic growth is positive and significant when all provinces in China are considered. However, this effect is driven by the coastal regions. A 10 percent increase in the financial sector output per worker increases growth by 0.29 percentage points in the coastal regions; however, the effects is not significant in noncoastal regions.

Barros (2009)	• A 10 percentage point increase in the ratio of deposits to GDP raises annual GDP per capita growth by between 0.023 and 0.048 percent.

Table 3. Finance-Growth Nexus: Volatility and Convergence	
References	**Empirical Findings**
Denizer, Iyigun, and Owen (2002)	• The authors find that a 36.8 percentage point increase in a proxy for financial depth leads to a 14 percent reduction in growth volatility, while a 20 percentage point increase in an alternative proxy leads to a 28 percent reduction in growth volatility.
Beck, Degryse, and Kneer (2013)	• The authors find that a one standard deviation increase in financial intermediation is associated with a decrease in growth volatility of 0.8 percentage point. This is an economically meaningful stabilizing effect of finance, because during the sample period (between 1980 and 2007), average volatility was 3.5 percent.
Hausmann and Gavin (1996)	• The authors find that low financial depth explains 20 percent of the difference in growth volatility between countries in Latin America and industrialized countries. This is not surprising given that economic growth in Latin America is twice as volatile as in industrialized countries.
Raddatz (2006)	• The author identifies the impact of finance on growth volatility with the methodology introduced by Rajan and Zingales (1998). Comparing the industrial machinery sector with the paper boxes industry in Spain and Egypt, he finds a reduction of 5.4 percentage points in volatility as a result of financial development.
Easterly, Islam, and Stiglitz (2000)	• The authors' estimates suggest that moving from the average level of financial development in non-OECD countries to the level in OECD countries (i.e., 39 percentage points) lowers growth volatility by 3.2 percent.
Fung (2009)	• The authors argue that countries above a certain threshold of GDP per capita and financial development converge to a parallel growth path. The author conjectures that poor countries with relatively well-developed financial sectors are more likely to transition into middle- and high-income countries than those with less developed financial sectors.
Aghion, Howitt, and Mayer-Foulkes (2005)	• The authors find that countries with ratios of private credit to GDP of and above 25 percent converge to the frontier growth rate. They also find that a one standard deviation increase in financial depth (i.e., 28 percentage points) would raise steady-state GDP by about 1 percent for countries such as Malaysia, South Africa, and Thailand.
Yilmazkuday (2011)	• The author finds that the catch-up effect of finance on growth starts for countries with GDP per capita beyond $1,636.

Table 4. Finance-Growth Nexus: Stock Market Depth and Liquidity	
References	**Empirical Findings**
Levine and Zervos (1998)	• As Levine (2005) interprets, consider a 0.3 percentage point increase in stock market liquidity in 1976. This scenario would accelerate economic growth on average by 0.8 percentage points annually, which means that in 1993, GDP per capita would be 15 percent higher than the counterfactual. • For a specific country example, imagine Mexico moving from its level of stock market liquidity to that of the sample average. Such a move would accelerate economic growth by about 0.4 percentage points annually, thereby having Mexico enjoy about 7.5 percent GDP per capita in 1994. • Consider a country at the sample average increasing both stock market liquidity and banking sector depth by one standard deviation in 1976. Such a scenario would lead to about 30 percent higher GDP per capita by 1994. More specifically, consider Mexico again. If both stock market and banking sector development improved at the same time in 1976, Mexico could have enjoyed almost 23 percent GDP per capita by 1994.
Rajan and Zingales (1998)	• As Levine (2005) interprets, the coefficient estimates from the difference-in-difference estimator can be read by comparing two industries (i.e., machinery at the 75th percentile of external finance dependence and beverages at the 25th percentile of dependence) along with two countries (i.e., Italy at the 75th percentile of the sample and the Philippines at the 25th percentile of stock market depth). The coefficient estimates from this study suggests that the machinery industry registers 1.3 percent higher growth than the beverages industry in Italy relative to the Philippines.
Atje and Jovanovic (1993)	• A 12 percentage point increase in the annual value of stock market trades as a share of GDP raises the growth rate by 1 percentage point.
Harris (1997)	• A 1 percentage point increase in stock market development leads to a 0.02 percentage point increase in growth, whereas Atje and Jovanovic (1993) find a higher effect. Indeed, the size of the effect found by Harris is quite small.
Rousseau and Wachtel (2000)	• The average ratio of value traded to GDP over 1988–95 for 47 countries was 17.05 percent. Raising this ratio by 10 percentage points would raise the GDP growth rate by over 0.5 percentage point. In a different specification, the same scenario leads to a 1 percent increase in annual growth rate per capita.
Beck and Levine (2004)	• As the authors interpret, consider an increase in Mexico's turnover ratio of 0.32 percentage point, to the average of OECD countries in 1996–98. This scenario would accelerate economic growth rate by 0.6 percentage point per year. • If Egypt's turnover ratio (10 percent) had been the sample mean of 37 percent, Egypt would have enjoyed annual growth that was nearly 1 percentage point higher.
Shen and Lee (2006)	• A 10 percentage point increase in stock market liquidity leads to a 1.14 percent increase in economic growth.

Levine (2002)	• The level of financial activity, as measured by the authors, in Peru and Argentina was −6.6 and −6.0, respectively. Had this level increased to the level of financial activity in Chile (i.e., −4.0) over the 1980–95 period, the rate of growth in real per capita GDP would increase by 1.15 percentage points for Peru and 0.89 percentage points in Argentina. As the authors suggest, this is a large effect because over this period, financial activity in Peru shrank at a rate of −1.8 percent per year while in Argentina it stagnated at 0.04 percent per year. • If the level of financial activity in Chile were to rise to the level in Thailand (i.e., similar countries in terms of GDP per capita in the sample period)—a change from −4.0 to −2.0—Chile's real GDP per capita would have grown 0.86 percentage points faster each year (it averaged 3.7 percent over the period).
Rousseau and Wachtel (2002)	• Raising stock market liquidity by 10 percentage points would accelerate the growth rate by 0.5 percent. The authors find similar results in terms of the effects of banking sector development and stock market development.

Table 5. Finance-Growth Nexus: Contractual Savings Institutions Depth	
References	**Empirical Findings**
Chen, Lee, and Lee (2012)	• A 1 percent increase in life insurance market development raises economic growth by 0.01–0.05 percentage points. When conditioned on the level of financial development (i.e., capital market development), the effect of life insurance on economic growth turns negative and significant. The authors interpret this as an indicator for a trade-off between life insurance and stock market development. • The effect of life insurance market development on economic growth is positive in Latin America (i.e., 0.06 percentage points) but not significant in Sub-Saharan Africa. The effect of life insurance market development on growth is larger and significant in low-income countries (i.e., 0.02 percentage point) compared with middle-income countries (i.e., 0.001 percentage point).
Webb, Grace, and Skipper (2002)	• A 2 percent increase in life insurance penetration results in a 1.12 percent increase in average GDP per capita. A 1 percent increase in average GDP per capita growth leads to a 0.4 percent increase in life insurance penetration. Raising the ratio of private credit to GDP by 10 percent leads to a 0.42 percent increase in average GDP per capita growth. The authors also find the development of the banking sector and the insurance sector has a larger effect jointly than their individual effects and the sum of their individual effects (i.e., a 2 percent increase in the interaction term leads to a 2.2 percent increase in real GDP per capita growth).
Arena (2008)	• A one standard deviation increase in the ratio of life insurance premiums to GDP implies an increase of 0.37 percent in economic growth, while the same scenario leads to 0.39 percent in economic growth for non-life insurance premiums. When combined, real GDP growth would increase by 0.47 percent. The effect of life insurance is driven by high-income countries (0.58 percent), while the effect of non-life insurance is driven by both high-income (0.53 percent) and developing countries (0.25 percent). Complementarities are detected. The larger the financial sector, the larger the effect of insurance on growth.
Curak (2009)	• A 1 percentage point increase in the ratio of life insurance premiums to GDP increases economic growth by about 0.87 percent, while for ratios of non-life insurance and total insurance premiums to GDP, the effect is 1.93 percent and 0.53 percent, respectively.

Han et al. (2010)	• Economic growth accelerates by about 4.8 percent in response to a 1 percent increase in total insurance density. Compare this result with the effect of banking activities on economic growth, which is not more than 1.8 percent given a 1 percent increase in the ratio of private credit to GDP. Consider life insurance density: Economic growth accelerates by 1.7 percent in response to a 1 percent increase in life insurance density. The effect is much larger for non-life insurance density, at about 4 percent. • Consider the effect of two indicators combined. The coefficient estimate is about 9 percent and 2 percent in developing and developed countries, respectively. Life insurance has a significant impact on economic growth only for the developing economies. Economic growth increases by 2.5 percent, when life insurance density increases by 1 percent for the developing economies. In developing economies, the effect of non-life insurance density is much more strongly associated with economic growth than in developed countries.
Hu (2005)	• Pension reform toward fully funded systems can accelerate GDP growth by 1 percent annually. Regarding pension fund assets, the author finds a negative effect on GDP growth for OECD countries but a positive effect in emerging market economies. Specifically, a 1 percent increase in the ratio of pension fund assets to GDP increases the growth rate by 2.8 percent in emerging market economies.
Holzmann (1997)	• Long-term growth in Chile is 1–3 percent higher owing to the effects of the pension reform operating through financial markets.
Davis and Hu (2008)	• A 1 percent increase in logarithm of pension-funds-asset/GDP ratio leads to a 0.167 percent increase in log output per worker in emerging markets sample while the effect is about three times smaller at 0.061 percent in OECD sample.
Zandberg et al. (2013)	• The growth in the ratio of pension assets to GDP is endogenous to capital market returns and economic growth is essentially correlated with capital market returns. Hence, when returns are controlled for, there exists no relationship between economic growth and pension's assets growth.
Avram, Nguyen, and Skully (2010)	• The authors found no statistically significant effect of insurance penetration but a positive and significant effect of insurance density on economic growth. This positive effect is driven by wealthier countries with good institutions. Its magnitude is on average a 0.93 percent acceleration in economic growth.
Omoke (2011)	• The insurance sector did not have any significantly positive effect on economic growth in Nigeria between 1970 and 2008.

Table 6. Finance-Growth Nexus: Nonlinearities and Heterogeneities	
References	**Empirical Findings**
Rioja and Valev (2004a)	• **Income Threshold:** A 10 percentage point increase in financial development results in a 0.20 percentage point higher growth rate in high-income countries, but there is no significant association in developing countries.
Rioja and Valev (2004b)	• **Income Threshold:** A 10 percentage point increase in the ratio of private credit to GDP would lead to a 0.61 percentage point increase in the growth rate in middle-income countries, but the effect is much smaller in size and significance in low-income and high-income countries.

Rousseau and Wachtel (2002)	• **Inflation Threshold:** A 10 percent increase in the liquid liabilities ratio (ratio of private credit to GDP) leads to an increase in annual growth rate of 0.15 (0.6–1.0) percentage points. To depress this positive growth effect, inflation would have to increase by more than 300 percentage points. When inflation falls between thresholds of 6 and 8 percent, the positive effect of finance on economic growth turns statistically significant.
Huang et al. (2010)	• **Inflation Threshold:** The positive effect of financial sector development on economic growth disappears for countries with inflation rates above 7.69 percent inflation.
Demirguc-Kunt, Feyen, and Levine (2011)	• **Income Threshold:** The effect of stock market development on economic growth is higher for countries below the 20th percentile in the distribution of economic development than for countries above the 75th percentile. Quantitatively, moving to the next percentile for the former countries results in a 5 percent increase in growth rates but adds at best 1 percent to the growth rates of the latter countries. • **Income Threshold:** The role of stock market development becomes more important as countries develop. While the association between banking sector development and economic growth is stronger for low-income countries, diminishing returns kick in quickly as countries develop. The same result does not hold for stock market development, as the diminishing returns kick in much later. According to the authors, the positive effect of banking sector development on economic growth switches sign when countries move beyond $1,032 (36th percentile) in GDP per capita.
Rousseau and Wachtel (2009)	• **Finance Threshold:** The effect on economic growth of the ratio of liquid liabilities to GDP reaches its maximum when the ratio is about 40 percent. • **Income Threshold:** The magnitude of the effect of the same financial depth proxy is higher for developed countries than for developing countries (i.e., a 0.08 versus 0.35 percentage point increase in growth rates in response to a 10 percent increase in the ratio of liquid liabilities to GDP).
Rousseau and Yilmazkuday (2009)	• **Inflation Threshold:** The positive effect of financial depth on economic growth is highly sensitive to changes in inflation rates when inflation is between 4 and 19 percent. A rise in inflation by 20 percentage points would make financial development act on growth as if financial depth were only about 36.4 percent, when in reality it is 50 percent. Note that low-income countries are much more sensitive to such inflation hikes than are high-income countries. Specifically, in response to the same scenario, the real GDP per capita growth rate would decrease much more drastically in low-income countries (0.9 percent) than in high-income countries (about 0.4 percent).

Cecchetti and Kharroubi (2012)	• **Finance Threshold:** From 2005 to 2009, Irish and Spanish employment in the finance sectors grew by 4.1 percent and 1.4 percent per year, on average. At the same time, output per worker in the economy fell by 2.7 percent and 1.4 percent, respectively. Had financial sector employment been constant in these two countries, it would have eliminated 1.4 percentage points from the decline in Ireland and 0.6 percentage points in Spain. In other words, financial sector employment growth is associated with 33 percent and 40 percent of the drop in Irish and Spanish output per worker, respectively. • **Finance Threshold:** Using employment measures, the authors find that when the financial sector represents more than 3.5 percent of total employment, further increases in financial sector size tend to be detrimental to growth. Relative to a country where the financial sector's share in total employment is stable, a typical financial boom—employment growth of 1.6 percent per year—reduces growth in aggregate GDP per worker by roughly one half of 1 percentage point.
Barajas, Chami, and Yousefi (2012)	• **Regional Heterogeneity:** The level of banking depth in the Middle East and North Africa (MENA) produces growth effects that are about one-third smaller than the same level of banking depth in other regions. For a country-specific example, the authors compare Armenia (non-MENA) and Libya (MENA). These are comparable countries in terms of financial depth (i.e., the ratio of private credit to GDP is 10 percent). A 20 percentage point increase in financial depth would raise economic growth by 1.3 percentage points in Armenia but by only about 0.5 percentage point in Libya. • **Income Threshold:** The authors refer to a widely known result that finance has a positive effect on growth for countries with GDP per capita above \$770, which corresponds to the 73rd percentile for low-income countries in 2008.
Beck et al. (2013)	• **Period Heterogeneity:** In the period 1995–2007, the link between finance and growth disappears. • **Income Threshold:** Financial intermediation is associated with lower volatility in low-income countries.
Favarra (2003)	• The author argues that the effect of financial development on economic growth is increasing monotonically only at intermediate levels of financial sector development. At very low and high levels, the effects are inverted, similar to the argument in Rioja and Valev (2004b).

Table 7. Finance-Growth Nexus: Financial Liberalization	
References	**Empirical Findings**
Roubini and Sala-i Martin (1992)	• Moving from a low level of economic distortions to a high level of economic distortions reduces growth rates by 3.1 percent per year. • Having excessively negative real interest rates (<-5) significantly harms economic growth at about 1.1 percent per year.
Henry (2003)	• Compared with the preliberalization average growth rate of output per worker, the author finds that emerging economies accelerate their growth rates on average by 2.3 percentage points, from 1.4 to 3.7 percent, thanks to equity market liberalization. Also see Henry (2000): In a sample of 11 developing countries, the author detects private investment booms following stock market liberalization for the majority of the countries. On average, countries experience a 22 percentage point increase in the sample mean for private investment in the three years after stock market liberalization.

Levchenko, Ranciere, and Thoenig (2009)	• A one standard deviation change in de facto financial openness is associated with a 1.3 percentage point increase in the output growth rate or 0.16 standard deviations. The positive effect occurs within the first six years.
Ranciere, Tornell, and Westermann (2006)	• The authors decompose the two effects of financial liberalization: the direct positive effect and the indirect negative effect through crisis propensity. On net, they find that the effect of financial liberalization on growth is about a 1 percent increase in the per capita annual growth rate.
Mattoo and Rathindran (2006)	• Countries with fully open financial sectors grow 1.2 percent faster than those without fully open financial sectors. This effect is larger for developing countries, among which those with fully opened financial systems grow 2.1 percent faster.
Bekaert et al. (2005)	• Authors show that equity market liberalization raises long-term growth by about 1 percent per year. Countries with ratios of private credit to GDP that are higher than the median experience significantly faster economic growth after liberalization (i.e., 0.57 percentage point difference between two groups). • The growth effect of financial liberalization is conditional on the quality of institutions. Countries with higher than median level of quality institutions grow 0.84 percentage points faster than countries below the median. A specific example is accounting standards. Countries with higher than mean accounting standards grow 1 percentage points faster than those with standards that are below average.
Bekaert, Harvey, and Lundblad (2001)	• The real GDP per capita growth rate increases on average by 1.4 percent per year following equity market liberalization. • The total impact on economic growth over the five-year period is 4.1 percent. Over half of the additional growth (2.3 percent) occurs in the first two years, and 87 percent of the five-year growth impact occurs in the first three years.
Klein and Olivei (1999)	• An increase in capital account liberalization from zero to the mean value in the sample of the nonzero observations (0.40 p.p.) would raise growth by 2.7 (5.3) percentage points when ratio of liquid liabilities to GDP (ratio of private credit to GDP) is used as a proxy. These are estimates from 3SLS procedure. Note that the results apply only to OECD members so we consider it as a benchmark study. In non-OECD, the effect of capital account liberalization is not statistically significant.
Tornell, Westermann, and Martinez (2004)	• Following capital account liberalization, the growth of GDP per capita accelerates by 2.4 percentage points per year. In different specifications, the effect changes from 1.7 to 2.5 percentage points. The increase in GDP growth is greater following financial liberalization than following trade liberalization (2.8 percent versus 1.6 percent). • Liberalization without fragility is ideal but not the case for developing countries. Compare India and Thailand: Moving from a risk-averse country like India to a risk-loving country like Thailand increases the average long-run GDP growth rate by 0.54 percentage point a year. Because Thailand grew about 2 percentage points faster per year than India, a quarter of this differential can be attributed to credit risk taking.
Bonfiglioli and Mendicino (2004)	• Capital account openness on its own has no significant effect on growth. Equity market liberalization does. Countries that liberalize their equity markets grow on average 1.2 percent faster than those that do not. Once the occurrence of bank crises is controlled for, capital account openness has a significant and positive effect on growth. Countries with open capital accounts grow 9.1 percent faster than others.

Bonfiglioli (2005)	• The author studies the effect of capital account liberalization and equity market liberalization on the sources of growth and finds that developing countries that liberalized their capital markets or equity markets experienced a 13 percent or 8.3 percent increase, respectively, in their total factor productivity. No robust evidence is found on capital accumulation.

Table 8. Finance-Growth Nexus: Growth Collapses, Output Losses and Fiscal Costs	
References	**Empirical Findings**
Cerra and Saxena (2008)	• The authors find persistent and negative effects of currency, banking, and twin crises on output. The magnitude of output losses varies by income groups. The average output loss following a currency crisis is 5 percent for low- and middle-income countries. A banking crisis leads to larger output losses at 7.5 percent. When twin crises are considered, the average output loss increases to 10 percent three years after the crisis. The rebound from these crises is less than 1 percentage point even 10 years after the crisis. • A monotonic relationship exists between the income and the frequency of crises. Low-income countries experience crises almost twice as frequently as high-income countries. The larger output losses in low-income countries relative to high-income countries emanate partly from high frequency of crises.
Laeven and Valencia (2010)	• The authors present a database on systemic banking crisis and output losses for a large sample of countries. For instance, they estimate that Argentina lost 71 percent of its output (i.e., the difference between actual and trend real GDP as a percentage of trend real GDP during the 2001–2003 period).
Reinhart and Rogoff (2009)	• During banking crises, output falls on average by over 9 percent, although the duration of the downturn is considerably shorter than for losses in employment. The drop in output is less for advanced economies than for emerging economies. • Historically, the largest output losses occurred in the United States during the Great Depression (about 29 percent) and Argentina in 2001 (about 22 percent), followed by Indonesia and Thailand (about 14 and 12 percent, respectively) during the Asian financial crisis.
Fallon and Lucas (2002)	• GDP growth decreased during the Asian financial crisis (1998) by 13.7 percent in Indonesia, 5.8 percent in Korea, 7.6 percent in Malaysia, 0.4 percent in Thailand, 4 percent in Argentina (1995), 6.2 percent in Mexico (1995), and 5.5 percent in Turkey (1994).
Furceri and Mourougane (2012)	• Financial crises are estimated to lower potential output by about 1.5–2.4 percent on average, with most of the impact coming from the effect on capital. The magnitude of the effect increases with the severity of the crisis. (Estimates are from an OECD sample, so can be taken as a benchmark.) • The impact of financial crises depends on the level of financial development and institutional quality of countries. For instance, while more financially developed countries incur larger costs, countries with better institutions incur smaller costs.
Kroszner, Laeven, and Klingebiel (2007)	• In the framework of Rajan and Zingales (1998), the authors find that during a banking crisis, sectors that depend heavily on external finance in countries with high external financial dependence experience larger contractions (i.e., 1.6 percent) in growth in value added relative to sectors that do not depend heavily on external finance in countries that also do not depend heavily on external finance. They suggest that external financial dependence accounts for 50 percent of the contraction in average growth in value added.

Hoggarth, Reis, and Saporta (2002)	• Cumulative output losses incurred during crisis periods are 15–20 percent of GDP, on average. Losses are higher in developed countries. A banking crisis are costly for emerging economies when there is a currency crisis. In the literature, the finding is that the cost of a single banking crisis, on average, is about 6–8 percent of annual GDP but if combined with a currency crisis, the cost is over 10 percent. The cumulative resolution costs of banking crises appear to be larger in emerging market economies (on average, 17.5 percent of annual GDP) than in developed ones (12 percent). The average resolution cost for a twin crisis is 23 percent of annual GDP compared with 4.5 percent for a banking crisis alone.
Hawkins and Mihaljek (2001)	• The authors estimated the cost of crisis as a percentage of GDP: Chile (1978–1983), 41 percent; Mexico (1995–1997), 14 percent; Argentina (1995), 2 percent; Brazil (1995), 5–10 percent; Thailand (1997), 24 percent; South Korea (1997), 17 percent; Indonesia (1997), 58 percent; Malaysia (1997), 10 percent; Philippines (1998), 7 percent; Turkey (2000), 6 percent.
BCBS (2010)	• The authors provide various important estimates based on their own literature review. They find the median drop in output across crises and across studies to be about 10 percent. They also refer to some studies that find a 2–10 percent difference between precrisis and postcrisis growth paths. Finally, the cumulative output losses are said to range from 20 to 100 percent and more of precrisis output. • A 1 percentage point reduction in the probability of crises generates a benefit on the order of 0.2 percent of GDP per year. The more severe the crisis, the more the gain from reducing crisis probability—up to 1.6 percent of GDP.
Barajas, Chami, and Yousefi (2012)	• The authors find that in the Middle East and North Africa, financial crisis pulls down the positive effect of financial depth on economic growth by about one half, on average.
Ranciere, Tornell, and Westermann (2006)	• Financial liberalization increases the probability of a twin crisis, on average by about 1.45 to 1.93 percentage points. The growth cost of financial liberalization ranges from −0.14 to −0.19 percentage points. Even then, the net positive effect of financial liberalization is between 1 and 1.5 percentage points.
Koivu (2002)	• If Romania's average share of NPLs of all loans between 1992 and 200 had been the average of the sample at 19.8 percent instead of 37 percent, its GDP growth rate would have been 1.9 percentage points higher.

Table 9. Finance-Growth Nexus: Regulations, Banking Structure and Ownership	
References	**Empirical Findings**
Angelini et al. (2011)	• The potential effects of Basel III on output are estimated: "Each percentage point increase in the capital ratio causes a median 0.09 percent decline in the level of steady state output, relative to the baseline. The impact of the new liquidity regulation is of a similar order of magnitude, at 0.08 percent." The central estimate is that the level of GDP will be 3.2 percent lower than it would otherwise be (i.e., relative to the baseline scenario) after five years, with an output loss of 0.7 percent per year.

Cournede and Slovik (2011)	• The authors find the following results, "To meet the capital requirements of Basel III, lending spreads by banks will have to increase on average by about 15 basis points. A 1 percentage point increase in the ratio of bank capital to risk-weighted assets could result in an average negative impact of 0.20 percent on the GDP level five years after implementation, leading to a 0.04 percentage point decline in annual GDP growth. For adjustment taking place ahead of the schedule, the negative impact of Basel III on annual GDP growth was estimated to be in the range of 0.05 to 0.15 percentage points over the medium term." This empirical estimate comes from an OECD sample, so it can be seen as a benchmark.
Rossi (1999)	• The author finds that prudential regulations have a positive and statistically significant effect on economic growth. The economic effect is quantified as follows: a one-unit increase in the prudential regulation index (ranging from 1 to 4) leads to increases of 2.29 percent in the growth rate of real GDP per capita . Supervision is found to have no direct effect on economic activity.
La Porta, Lopez de Silanes, and Shleifer (2002)	• A 10 percentage point increase in the proportions of assets of the largest banks owned by the government is associated with a decline in the annual growth rate of about 0.24 percent. This effect works only in developing countries, not in industrial countries. Moving from the average government ownership in sample countries with French legal origin to those with English legal origin (i.e., a 30 percentage point increase) implies a 0.72 percent decrease in annual GDP growth.
Andrianova, Demetriades, and Shortland (2012)	• A replication of the La Porta study with additional institutional covariates. In an updated sample from the period 1995–2007, the authors find that a 50 percent increase in government ownership raises long-run GDP growth by 1.8 percent per year.
Bayraktar and Wang (2006)	• A 1 percent increase in the share of foreign bank assets in the economy raises economic growth by 0.171 percent. Once various bank variables are controlled for, this effect is reduced to 0.130 percent and 0.091 percent; it turns insignificant when overhead costs are controlled for. • As for the indirect effect, a 1 percent increase in the foreign bank asset share leads to a 0.038 percent decrease in the net interest margin. No significant effects are found on costs and profits. Yet a 1 percent increase in profits lead to a 0.6 percent increase in growth, while a 1 percent decrease in the ratio of overhead cost to total assets leads to a 0.4 percent increase in economic growth.
Fernandez, Gonzalez, and Suarez (2010)	• Activity restrictions on commercial banks are found to mitigate some of the negative effect of concentration on growth. Specifically, a one standard deviation increase in regulations reduces the negative effect of bank concentration on economic growth on average by more than four times the standard deviation of economic growth. Supervision does not seem to have a significant effect.

Table 10. Finance-Growth Nexus: Banking Sector Efficiency	
References	**Empirical Findings**
Berger, Hasan, and Klapper (2004)	• An increase of 10 percentage points in small banks' market share leads to an increase in GDP growth of about 1–2 percentage points on average. An increase in the efficiency of small banks leads to an increase in GDP growth of about half of percentage point.

Cojocaru, Hoffman, and Miller (2011)	• If Bulgaria in 2008 were to achieve the interest spread of the Czech Republic (i.e., 34.22 versus 5.38), then Bulgaria's economy would have grown 3.77 percent faster than the counterfactual. • If Uzbekistan in 2008 were to reduce concentration from 0.92 to the level of Slovenia (0.68), then Uzbekistan's economy would have grown 0.79 percent faster.
Koivu (2002)	• If the average interest rate margin in Bulgaria were at the average of the transition countries (23 percentage points) instead of 51 percentage points during the period of investigation, its annual GDP growth would have been 1.2 percentage points faster. In Georgia, annual GDP growth would have been 4.6 percentage points faster if its interest margin had been at the average level of the transition countries. The average interest rate margin stands at 4.1 percentage points in Estonia, at the lowest, and at 74.4 percentage points in Tajikistan. Owing to this difference in margins, Estonia's GDP grew 3 percentage points faster annually than in Tajikistan.
Demirguc-Kunt, Levine and Min (1998)	• A one standard deviation decrease in bank overhead expenses as a share of total bank assets implies that real per capita GDP growth would have been 1 percentage point faster. If Mexico had the sample mean value of overhead as a share of total assets (3.5) instead of its own value (4.9), Mexico's GDP would have grown 0.8 percentage points faster.
Levine (2002)	• If Chile were to have the same level of financial efficiency (0.20) as Thailand (2.33), Chile's GDP would have grown by 1.12 percentage points faster. The effect of financial efficiency here is larger than the effect of financial depth.

Table 11. Finance-Growth Nexus: Banking Sector Inclusion	
References	**Empirical Findings**
Burgess and Pande (2005)	• A 10 percent increase in the number of rural locations banked per capita leads to a decrease in rural poverty by about 4.2 percent. The same scenario leads to an increase in total output by about 3.4 percent.
Bhattacharya and Wolde (2010)	• Reducing the access-to-finance constraint from the average in the Middle East and North Africa (32.9) to the average worldwide (30.7) could have increased real per capita income growth by about 0.1 percent annually. The authors estimate the growth effects for various countries in the region: 0.88 percent in Algeria, 0.55 percent in Mauritania, 0.49 percent in Lebanon, 0.24 percent in Pakistan, and 0.20 percent in West Bank and Gaza.
Beck, Demirguc-Kunt and Maksimovic (2005)	• The composite index for financing obstacles negatively affects the growth of small firms more severely than that of large firms. The differential effect is both statistically and economically significant at about 4 percent. The largest differential impact is for the financing obstacle of "having connections with the bank," with a 5.1 percent differential growth effect. • Given the financial constraints, a 1 percent increase in the ratio of private credit to GDP raises firm growth by 3.9 percent. So, although this financing constraint has negative effects on firm growth, firms in more financially developed countries do not suffer from such financing constraints. • Last but not least, a marginal increase in the level of financial development relaxes the constraints on smaller firms much more than it does for larger firms (i.e., the differential impact is 12.6 percent).

Beck, Demirguc-Kunt, Laeven and Levine. (2008)	• The authors compare the growth of an industry with a relatively large share of small firms and an industry with a relatively low share of small firms across two countries with different levels of financial development. They find that finance relaxes constraints on small firm growth. • The furniture industry (75th percentile of small firm share) should grow 1.4 percent per year faster than the spinning industry (25th percentile of small firm share) in Canada (75th percentile of private credit) than in India (25th percentile of private credit). Because the average growth rate in their sample is 3.4 percent, this is a relatively large effect.
Ayyagari, Demirguc-Kunt, and Maksimovic (2006)	• Firms that report minor financing constraints as opposed to no constraints at all grow 3.2 percent more slowly.
Demirguc-Kunt and Maksimovic (1998)	• The authors calculate how much external financing firms need to invest in profitable investment projects that would expand their businesses. They find that firms in countries with more active stock markets and better legal systems are more likely to experience higher growth.
Demirguc-Kunt and Maksimovic (2002)	• The authors find that the effect of financial sector development on firm growth varies by the quality of the contracting environment in the country. A larger proportion of firms obtain outside financing when the contracting environment is conducive to the development of a large banking sector and an active stock market. Whereas the development of securities markets is more related to long-term financing, the development of the banking sector is more related to the availability of short-term financing.

Table 12. Finance-Employment Nexus	
References	**Empirical Findings**
Pagano and Pica (2012)	• The authors compute the percentage differential in the real growth rates between industries at the 75th and 25th percentiles in terms of external dependence (i.e., textiles versus nonmetal products) when they are located in countries at the 75th and the 25th percentiles in terms of financial development (i.e., Ireland versus Panama or Spain versus El Salvador). The differential ranges between 0.23 percent and 0.83 percent for employment. Hence, the effect of financial development on employment growth is between 0.23 and 0.83 percent. • The authors also refer to the International Labour Organization's estimate that recovering to precrisis levels of employment will require the creation of 20 million jobs.
Reinhart and Rogoff (2009)	• Banking crises are associated with drastic declines in employment. The unemployment rate increases by 7 percentage points over the down phase of the cycle, which lasts on average about four years. The record is held by the United States in the aftermath of the Great Recession, where unemployment rose by 20 percentage points. Note that there is some heterogeneity across countries. For instance, with regard to unemployment rates, the performance of advanced economies is worse than that of Asian emerging economies.

World Bank (2009)	• The authors provide descriptive statistics on the loss of employment following the recent global financial crisis. "Preliminary survey evidence from Eastern Europe and Central Asia (ECA) indicates that on average, registered unemployment increased by approximately 20 percent from March 2008 to March 2009. However Russia, Turkey, and the Baltic states have been hit particularly hard, with increases of more than 200 percent in Latvia and Lithuania, 300 percent in Estonia, and more than 60 percent in Turkey." • "In India, the Ministry of Labor indicates that more than 500,000 jobs were lost during the last three months of 2008 in export-oriented sectors alone, including gems and jewelry, autos, and textiles." • According to the International Labour Organization, "the number of workers categorized as working poor (using the US\$1.25 per day poverty line) is estimated to increase by 233 million between 2007 and 2009. This is an increase of 7.2 percentage points, with 103 million additional working poor in South Asia and 36 million in Sub-Saharan Africa. With the US\$2 per day poverty line, the additional number of working poor rises to 1.2 billion (up 1.5 points), with the largest increase in East Asia (67 million), followed by South Asia (52 million)."
Furceri and Mourougane (2012)	• Financial crises are estimated to lower employment by about 0.7 percent. The main effect of the financial crisis is on capital, so the effect of financial crisis on output operates mainly through capital, not labor or total factor productivity. Theoretically, the effect of financial crisis on labor force participation is ambiguous because the encouraged worker effect and the discouraged worker effect operate in opposite directions. Yet the effect on the structural unemployment rate is evident due to hysteresis. This is evidence from OECD countries.
Aterido, Hallward-Driemeier, and Pages (2007)	• Firms that have access to overdraft facilities have, on average, close to 1 percentage point faster employment growth, while mean employment growth is 10.3 percent. • In Argentina and Mexico, increasing the share of external financing for investments by 10 percentage points would increase overall employment by 5 percentage points. The same increase in finance for working capital would raise employment by 8 percentage points. • In Argentina, reducing the incidence of corruption by 10 percentage points would increase overall employment in the business sector by 0.5 percentage point.
Park and Sung (2013)	• The authors consider the effect of financial liberalization on corporate employment. A 1 percentage point increase in the ratio of foreign loans to total loans leads to a 0.0003 unit increase in employment. Yet the ratio increased quite a lot after liberalization (i.e., the mean ratio was 0.542 and 1,210.43 after liberalization).
Choudry, Marelli, and Signorelli (2010)	• A 1 percent increase in the index of systemic crisis reduces the employment rate by 0.394 percentage points. However, this significant negative effect is driven mostly by high- and upper-middle-income countries, and there seems to be no significant association between financial crisis and employment rate in lower-middle-income and low-income countries. The effect is a decrease of 1.32 and 1.01 percentage points in the employment rate in high- and upper-middle-income countries. • Disaggregating by the type of crisis: there are negative and statistically significant effects of currency crisis (1.07) and debt crisis (1.44) and the sum of bank, currency, and debt crisis (0.612). Looking at the unemployment rate, it seems that financial crises have positive effects on unemployment that are statistically significant. However, the effect peaks in the second to third year after the crisis, and after five years there seems to be no association between the two. Specifically, the effect peaks in the third year with a coefficient estimate of 1.166; the measure for the second year is 1.222 and for the first year is 0.754.

Aterido and Hallward-Driemeier (2010)	• In Sub-Saharan Africa, a one standard deviation increase in the share of investments financed externally would reduce employment growth by 5.8 percent. Because the sample average for employment growth is 11 percent, the authors detect a large effect. As noted in the text, this surprising association is driven by micro firms. The same scenario would lead to an increase of 3.6 percent in employment growth in non-African low-income countries.

Table 13. Determinants of Financial Development

A. Financial Depth

References	Empirical Findings
Barth, Caprio, and Levine (2004)	• In Egypt, where many restrictions on bank activities are imposed, a 1.2 percentage point decrease in the index of restrictions would increase bank development by 0.14 percentage points. This would increase Egypt's bank development from 0.49 percent to 0.63 percent, which is about the level in Italy. • In a country with an intermediate level of political openness, such as the Republic of Korea, a one standard deviation increase in official supervisory power would decrease bank development by 0.09 percentage points. This large change would move the level of bank development in Korea (0.73) toward that of Chile (0.63), which is near the sample average. In contrast, the same increase in official supervisory power in France would be associated with an increase in bank development of 0.07 percentage points. • A one-unit increase in the private monitoring index in a country with both weak private monitoring and low bank development, such as Bangladesh, would increase bank development by about 32 percent.
Detragiache, Gupta, and Tressel (2005)	• The authors find that a one standard deviation increase in credit registry index leads to a 0.22 standard deviation increase in financial depth.
Bonfiglioli and Mendicino (2004)	• Countries with open capital accounts have ratios of private credit to GDP that are 56 percentage points higher than countries that lack such accounts. We take this estimate to be a descriptive statistic.
Chinn and Ito (2002)	• In the least developed countries (LDCs), a one-unit increase in the financial openness index leads to a 0.5 percent increase in the growth rate of stock market liquidity. • The impact is higher in emerging markets than in LDCs. Between 1992 and 1997, Argentina increased financial openness by 3.08 units, which led to an increase of 2.1 percent in the annual growth rate of stock market value traded and a 4.3 percent increase in stock market turnover. The same amount of change in openness would lead to a 1.6 percent increase in value traded in LDCs but no effect on stock market turnover. • A one-unit increase in openness leads to a 0.5 percent increase in private credit growth in emerging market economies. This magnitude is larger than the effect of openness on private credit growth in the full sample.

Chinn and Ito (2006)	• Peru increased its financial openness level from –1.84 to 2.27 between 1990 and 1995. Given its low institutional quality index (–1.65), the increase in financial openness would reduce the growth rate of stock market total value by 4.1 percent points annually. For capital account openness to contribute to the development of equity markets, countries must score a level of legal/institutional development greater than –0.68. • Emerging market countries with an average value of –0.28 on the institutional quality index benefit from opening their capital accounts. Take Tunisia, where the index value (–0.683) is closest to the threshold level. Countries where the index value is marginally above the threshold level include India and Morocco (–0.561 and –0.566, respectively), while those closely below the threshold include Mexico and Iran (–0.793 and –0.738, respectively).
Ito (2006)	• A one-unit increase in capital account openness leads to a 0.24 percentage point increase in total value traded in the stock market in Asia but reduces it by 0.40 percentage point in Latin America and 0.12 percentage point in LDCs outside Asia. In emerging markets, the total effect is 0.41 percentage point. So without a good legal/institutional environment, there are no positive effects on the stock market development. • Thailand increased its openness index by 1.10 units but since it is better in institutional setup than other comparable countries, this smaller increase is expected to lead to an increase of 1.2 percentage points annually. For developing countries in the sample, the average growth of total value traded on the stock market is 1.99 percent per year.
Yartey (2008)	• A one percentage point increase in banking sector development increases stock market development by 0.197 percentage point. The effect of stock market liquidity is even higher, at more than 0.4 percentage point under the same scenario. We take these as simple correlations.
Levine (1998)	• A one standard deviation increase in creditor rights (1.1 units) would lead to a 0.10 percentage point increase in bank development, which is about 12 percent of the mean value of bank development. Enforcement has a larger effect; a one-standard deviation increase (2.2) would lead to a 0.35 percentage point increase in bank development (about 40 percent of the mean value of bank development). Also, a one standard deviation increase in both creditor rights and enforcement would boost bank development by 0.45 percentage point.
Pistor, Raiser, and Gelfer (2000)	• According to the authors, if the level of rule of law in Russia were increase to that of Poland, then this alone could explain 20 percent of the difference in market capitalization between the two countries. • For shareholder protection, the quality of securities market regulations has a positive and significant effect. A one point increase (index: 0 to 6), leads to a 1.5 percentage point increase in market capitalization. In a different specification, they find that a 1 percentage point increase in the creditor protection index leads to a 5 percent increase in the ratio of private credit to GDP.

Detragiache, Gupta, and Tressel (2008)	• Intense banking reform episodes lead to drastic financial deepening. Specifically, the ratio of private credit to GDP increases by about 10 percentage points over five years. The magnitude of banking sector deepening after banking reforms in developing countries is twice as large as in developed countries. • The long-run effect of the banking reforms is significant in countries with a property rights index above the median. The banking reform index has no effect on financial development in countries that have a better supervisory environment. • At a five-year horizon, the ratio of private credit to GDP increases by 30 percent in countries with good property rights, thanks to extensive banking reform. A typical country, however, would experience an increase of 8 percentage points thanks to such reform. In countries with weak political institutions, the estimated effect is close to zero.
Djankov, McLiesh, and Shleifer (2007)	• While a 1-point increase in the score of creditor rights leads to a 4 percentage point (minimum) increase in financial depth, the introduction of credit information bureaus (both public and private) leads to a 17 percentage point (maximum) increase in financial depth.
Levine, Loayza, and Beck (2000)	• According to their coefficient estimates, if Uruguay—the country ranked lowest in accounting standards, with a score of 31 out of 90—were to increase its standards to the level of Chile's standards, which were the median accounting standards in the sample (i.e., 52), then Uruguay would have improved the depth of its banking sector by 37.8 percent. This would imply that Uruguay would surpass Chile in terms of financial depth. In the sample, Chile's average banking sector depth between 1960 and 1995 was 27.81 percent, while Uruguay's average banking sector depth in the same period was 21.21 percent.

Table 13. Determinants of Financial Development	
B. Financial Stability	
References	**Empirical Findings**
Sundararajan, Marston, and Basu (2001)	• The authors do not find any statistically significant relationship between financial system soundness and noncompliance with the Basel Core Principles. Yet, in countries with high loan growth, that noncompliance matters for financial soundness. Demirguc-Kunt and Detragiache (2011) arrives at a similar conclusion.
Das, Quintyn, and Chenard (2004)	• A one-unit increase in regulatory governance index based on Financial Sector Assessment Program leads to a 0.696 unit increase in the financial system soundness index based on capital adequacy and NPL ratio weighted by the ratio of bank credit to GDP.
Demirguc-Kunt, Detragiache and Tresel (2008)	• A decline in compliance with the Basel Core Principles from largely compliant to materially noncompliant would lower banking soundness (i.e., Moody's financial ratios and z-scores) by one category (i.e., the rating of a bank from D to D−). The results are not robust to inclusion of institutional covariates. Chapters 2 and 5 of the Basel Core Principles are the drivers of this relationship (entry and disclosure).
Demirguc-Kunt and Detragiache (2002)	• If the deposit insurance scheme were covered at the same level as in Switzerland, the crisis probability in Kenya would decline from 26.8 to 16.6 percent. In the Philippines, it would decline from 21.0 to 3.8 percent, and in Venezuela, from 17 to 12.5 percent. • This significant positive relationship does not hold in countries with good institutions.

Angkinand (2009)	• The effects of bank regulation in reducing the severity of crises are substantial and economically significant. Note the sample average of output cost of 3 percent of GDP per banking crisis episode. A 1 percent increase in the deposit insurance coverage limit relative to deposits per capita decreases the output cost by about 1 percentage point. • A one-unit increase in the capital requirement stringency (on a scale of 0–10) lowers the output cost by 0.8 percentage point. A one-unit increase in restrictions on bank activities (on a scale of 0–14) increases the output cost by 0.4 percentage point.
BCBS (2010)	• Introducing Basel III is expected to decrease the severity and probability of crisis. Increasing the capital ratio from 7 to 8 percent, with no change in liquid assets, reduces the probability of a banking crisis from 4.6 to 3.0 percent. The decrease in the likelihood of crises is three times larger when capital adequacy ratio is increased from 7 to 8 percent than when it is raised from 10 to 11 percent. • A 1 percentage point increase in capital requirement (with no change in liquidity ratios) translates into a 0.09 percent median loss in level of output, with a range from 0.02 to 0.35 percent. Hence, net benefits are positive for nonexcessive capital adequacy ratios.
Gonzalez (2005)	• The higher the charter value of a bank, the lower the probability of risk taking. The charter value of banks with low regulatory restrictions is 0.15 basis points higher than for banks in countries with high regulatory restrictions. Similarly, the charter value of banks in countries with deposit insurance is 0.24 basis points higher than for banks in countries without deposit insurance. • A 1 percent increase in Tobin's Q reduces NPLs by about 18 percent and stock price volatility by 13 percent in countries with a weak contracting environment and fewer regulatory restrictions. The effect of charter value on bank risk taking (i.e., NPLs) in banks with weaker regulation but a high-quality legal system and enforcement is a decrease of 11.3 percent. • Deposit insurance in countries with a poor contracting environment and stricter regulation still leads to an increase in the average ratio of NPLs of 5.89 basis points.
Beck, Demirguc-Kunt, and Levine (2006b)	• Concentrated banking systems are less vulnerable to systemic banking crisis. A one standard deviation increase in concentration leads to a decrease in the probability of crisis by 1 percent. Given that crisis probability is about 5 percent, the magnitude is quite large.
De Haan et al. (2009)	• Having better supervision reduces the positive effect of financial liberalization on banking crisis by 1.7 percent, in a sample where the probability of systemic banking crisis is 18.9 percent. This reduction in probability thanks to supervision peaks for the interest rate control dimension of financial reform. Having better supervision reduces the probability of systemic banking crisis by 4.4 percent in the presence of interest rate liberalization. The authors also find that supervision has no effect on nonsystemic banking crisis.
Papi, Presbitero, and Zazzaro (2012)	• The probability of banking crisis is 18.9 percent lower for countries that signed an IMF lending agreement and were compliant with the IMF conditionality on financial sector reform. A lending agreement without compliance lowers the probability of banking crisis by only 6.8 percent.
Yeyati and Micco (2003)	• A one standard deviation increase in the share of assets held by foreign banks reduces systemic banking risk by 1.13 percentage points. Note that the mean of systemic risk is 35.04.

Micco and Panizza (2006)	• In developing countries, the share of NPLs of public banks is higher than that of private domestic banks (i.e., 6.5 percent). The difference is quite large given that the average NPL ratio in these countries is 12 percent.
Schaeck et al. (2009)	• Competitive banking systems have lower probability of banking crisis and longer time periods for bank survival. A one standard deviation (0.13) increase in the H-statistic (toward a more competitive system) leads to a 1.8 percent decrease in the probability of observing a crisis. • Various regulations (i.e., activity restrictions, capital adequacy ratio, and government ownership) are not significantly associated with the timing of crisis. However, activity restrictions increase the probability of banking crisis in the logit specification.

Table 13. Determinants of Financial Development	
C. Financial Efficiency	
References	**Empirical Findings**
Demirguc-Kunt, Laeven, and Levine (2004)	• A one standard deviation drop in activity restrictions leads to a 0.6 standard deviation drop in the net interest margin. For instance, giving Mexico the same level of activity restriction as Korea would lead to a 1 percentage point decrease in net margins in Mexico. However, once institutional framework is controlled for, regulations cease to have an impact on efficiency. Better institutional environment (according to the World Governance Indicators) and economic freedom are strongly associated with lower net interest margins. Specifically, a one standard deviation improvement in economic freedoms (0.54) would lower interest margins by 1.1 percentage points. • If Romania had the same banking concentration as Poland, its net interest margin would drop from 8.45 to 7.97. Also, if Burundi had the same banking concentration as Kenya, its net interest margin would drop from 10.74 to 9.95.
Pasiouras, Tanna, and Zopounidis (2009)	• A one-unit increase in capital requirements reduces bank's cost inefficiency by 9 percent. Under the same scenario, market discipline, activity restrictions, and official supervisory power lead to 10 percent, 9 percent, and 8 percent reductions in cost inefficiency. The effect of official supervision on profit inefficiency is about 6.6 percent, whereas market discipline leads to a 25 percent reduction in profit inefficiency.
Bayraktar and Wang (2004)	• A one standard deviation increase in the asset share of foreign banks in the economy (i.e., 15.9 percent) leads to a 0.03 percentage point decrease in net interest margins, a 0.14 percentage point decrease in no-interest income, a 0.11 percentage point decrease in before-tax profits, and a 0.05 percentage point decrease in overhead costs. The efficiency gains are more pronounced in countries that liberalized their stock markets first (i.e., a 0.06 percentage point decrease in before-tax profits as a share of total assets and a 0.03 percentage point decrease in overhead costs as a share of total assets.). • Foreign bank entry lowers efficiency in countries that liberalized their domestic financial markets first (i.e., a 0.24 percentage point increase in net interest margin, a 0.26 percentage point increase in non-income interest, and a 0.33 percentage point increase in overhead costs as a share of total assets). The effect in countries that have liberalized their capital accounts is similar but weaker.

Claessens, Demirguc-Kunt, and Huizinga (2001)	• A one standard deviation change (i.e., 0.30) in the share of foreign banks in the domestic economy reduces non-interest income as a share of total assets by 0.7 percentage point, before-tax profits by 0.84 percentage point, and overhead costs by 0.45 percentage point. • In low-income countries, the net interest margins of foreign banks are higher than those of domestic banks (3.71 versus 2.72). In upper-middle-income countries, the net interest margins of domestic banks are higher as are overhead costs as a share of total assets (i.e., 4.23 versus 3.78, and 4.31 versus 3.60). In developed countries, all variables are higher for domestic banks than for foreign banks.
Denizer (2000)	• The higher the share of foreign banks in a country, the lower the overhead costs. Specifically, a 10 percent increase in the share of foreign banks in the domestic economy leads to a 0.37 percentage point decrease in the ratio of overhead costs to total assets. • Whereas foreign banks have a higher return on assets than domestic banks (i.e., 0.5 to 4.1 percentage points), a 10 percent increase in the share of foreign banks in the domestic economy reduces that return by 3.2 percentage points. • In response to foreign entry, as noted by Bhattacharya (1993), fees on letters of credit declined from 1.5 to 0.5 percent and fees on letters of guarantees fell from 4 to 1 percent.
Barajas, Steiner, and Salazar (2000)	• Whether market share or penetration indicators are used, foreign entry appears to have a significant effect on lowering spreads (-0.1394 to 0.2131), reducing nonfinancial costs (0.0321 and 0.1282), and improving loan quality (reducing NPL by 0.2164 and 0.2606) in the banking system. Controlling for foreign entry, domestic entry is also associated with better banking performance—and more often more significantly than foreign entry.
Martinez Peria and Mody (2004)	• A one standard deviation increase in concentration results in a 0.13 to 0.25 standard deviation change in bank spreads. A one standard deviation increase in foreign bank share (i.e., 0.119) leads to a 0.20 percentage point decrease in administrative costs in the entire banking system. • Note that the positive effect of banking concentration on administrative costs dominates the negative effects of foreign participation. Specifically, a one standard deviation increase in banking concentration (i.e., 0.105) leads to a 0.36 standard deviation increase in administrative costs (or 0.47 percent).
Haber and Musacchio (2012)	• Foreign banks tend to have lower interest rate margins. Even though the magnitude of the coefficients decreases over time, the difference between foreign banks and the industry average in 2004 was still 0.69 percentage points. • Mexican banks, on average, have become progressively more efficient over time: the ratio of administrative costs to assets in 2002–04 was more than 0.9 percentage point lower than in 1997. • The coefficients on the 2003 and 2004 time dummies are significant at the 5 percent level and indicate quarterly rates of return of 8 to 9 percentage points above the level in 1997.
Demirguc-Kunt, Levine and Min (1998)	• A 1 percent increase in the share of foreign banks reduces bank profits by 2.7 percent and overhead costs by 3.4 percent. Even though the authors do not detect a direct link between long-run growth and foreign entry, they do see banking efficiency related to economic growth.
Gormley (2007)	• The average foreign bank in a developing country has a return on assets 0.31 percentage point higher than that of a comparable private domestic bank (this is about one-quarter of the average return in the subsample of developing countries).

Micco and Panizza (2006)	• A state-owned bank has a return on assets 0.7 percentage points lower than the average private domestic bank. As the average return on assets in developing countries is 1.7 percent, this is a sizable difference. In industrial countries, public banks have overhead costs that are between 8 and 10 percent higher than the group average. The corresponding value for developing countries is 5 percent. • In developing countries, public banks have a higher employment ratio than private banks (the difference is about 9 percentage points) and foreign banks tend to have lower employment (the difference is about 25 percent of the group average).
Detragiache, Gupta, and Tressel (2005)	• A one standard deviation increase in banking sector concentration, proxied by the market share of the top five banks, reduces the ratio of overhead costs to total assets and net interest margins by 0.9 and 1.83 percentage points, respectively. Clearly, concentration matters more for net interest margins.

Table 13. Determinants of Financial Development	
D. Access to Finance	
References	**Empirical Findings**
Barth et al. (2009)	• The authors find that a one standard deviation increase in the number of applications of banks denied for entry into the banking system leads to 1.7 percentage point increase in the probability that a firm rates bank corruption as a major obstacle and a 3.5 percentage point decrease in the probability that a firm rates bank corruption as not an obstacle to firm growth. In a similar fashion, a one standard deviation increase in entry barriers would lead to a 3 percentage point increase in the probability that a firm rates bank corruption as a major obstacle and a 6.2 percentage point decrease in the probability that a firm rates bank corruption as not an obstacle to firm growth. • The disclosure of audited financial statements leads to a 4.2 percentage point decrease in the probability that a firm rates bank corruption as a major obstacle and a 9.9 percentage point increase in the probability that a firm rates bank corruption as not an obstacle to firm growth. • The existence of a deposit insurance scheme results in a 5.8 percentage point increase in the probability that a firm rates bank corruption as a major obstacle.
Allen et al. (2012)	• Reducing distance barriers (measured by a one standard deviation increase in branch or ATM penetration) increases the likelihood of bank account ownership by 6 percentage points. A higher share of deposits covered by the deposit insurance system raises the likelihood of having an account by 4 percentage points. • Policies that favor access to finance raise the likelihood of high-frequency use by 5.5 percentage points. Such policies almost cancel the negative effects of the variables related to higher costs (about 7 percentage points). • If people perceived the costs associated with opening a bank account as low, then the probability of opening an account is about 6 percentage points higher in Malawi and 15 percentage points higher in Peru. • The average predicted probability of having an account at a formal financial institution would be about 7 percentage points higher in Angola and India if the number of bank branches per 1,000 square kilometers were to increase by one standard deviation (to 36). Under the same scenario, the average predicted probability of having an account at a formal financial institution would rise by 3 percentage points in the United States but by 8 percentage points in Peru.

Clarke, Cull, and Martinez Peria (2006)	• Increasing foreign bank participation from that of countries in the 20th percentile in the sample (5 percent) to that of countries in the 80th percentile (48 percent) decreases the probability that the average enterprise manager would perceive interest rates and access to long-term loans to be a major constraint by 16 and 17 percent, respectively. The estimates suggest that the impact is slightly less for small enterprises (14 and 15 percent, respectively), than for large enterprises (17 and 16 percent, respectively).
Beck, Demirguc-Kunt, and Martinez Peria (2007)	• A one standard deviation increase in outreach indicators is associated with decreases of 0.07, 0.11, 0.05, and 0.16 percentage points in financing obstacles for geographic branch penetration, demographic branch penetration, geographic ATM penetration, and demographic ATM penetration, respectively. This is economically significant because the standard deviation of financing obstacles across countries is 0.44. • Increasing the number of branches and ATMs from the 25th percentile to the 75th percentile decreases the probability that firms rate financing constraints as a major obstacle by over 3 and 8 percentage points, respectively, in the case of branches and ATMs per capita. The same scenarios would lead to reductions of less than 1 or 0.5 percentage point in case of branches or ATMs per area, respectively. A similar change in the ratio of loans per population decreases the likelihood that finance is rated as a major obstacle by over 8 percentage points. Compare these marginal effects to the 36 percent of firms in the sample that rated financing as a major obstacle. • A one standard deviation increase in the credit information index raises access to finance (i.e., demographic branch penetration) by 3.6 percent. A one standard deviation increase in the restriction of banking activities lowers demographic branch penetration by 4.15 percent. A one standard deviation increase in the entry restrictions of banks lowers loan accounts per capita by 8.5 percent. A one standard deviation increase in the cost of contract enforcement lowers demographic ATM penetration by 11.41 percent. • A one standard deviation increase in concentration in the banking system raises deposit accounts per capita by 43 percent but reduces deposit income ratio by 55.82 percent. A one standard deviation increase in the share of assets of government banks reduces demographic branch penetration by 3.86 percent and demographic ATM penetration by 9.6 percent.
Gormley (2007)	• Foreign banks finance only a small set of very profitable firms upon entry (i.e., the top 10 percent firms in terms of return on assets), and firms are 7.6 percentage points less likely to have a long-term loan of any size after foreign bank entry because of a systematic drop in domestic bank loans.
Galindo and Micco (2005)	• The authors find a significant effect of creditor rights on access to finance by firms: small firms finance nearly 10 percentage points less investment with bank credit than do large firms, and medium-sized firms finance nearly 5 percentage points less than do large firms. As creditor rights improve, the gap gets smaller. • An increase in effective creditor rights from the 20th to the 80th percentile of the distribution reduces the financing gap between small and large firms by nearly 10 percentage points. These are large numbers if we consider that for a country in the 20th percentile, the estimated gap in access to bank finance between small and large firms is close to 25 percentage points. • In common law countries, the difference in the share of investment financed with bank credit between large and small firms is approximately 9 percentage points. In other countries, this difference is 25 percentage points.

Beck, Demirguc-Kunt and Maksimovic (2004)	• Moving from the 25th percentile of concentration (Peru) to the 75th percentile (Senegal) increases the probability that finance is perceived as a major obstacle by 5 percentage points, compared with the sample mean of 38 percent. This effect is stronger for small enterprises (6 percentage points) than for large enterprises (2 percentage points). • Nonlinearity: For Ethiopia (GDP per capita: $108), moving from the 75th to the 25th percentile of concentration would imply a 4 percentage point decrease in the probability that a firm rates financing as a major obstacle, while for Moldova (GDP per capita $666), the decrease would be only 2 percentage points. • While Mexico has a value of −0.07 for institutional development, Chile has a value of 0.88. Bank concentration in Mexico is 0.63 and in Chile 0.46. The probability that firms in Chile and Mexico rate financing as a major obstacle is 25.1 percent and 39.7 percent, respectively. Among the regulatory variables, restrictions on banking activities and credit registries matter. Whereas the former exacerbates the effect of bank concentration on firms' financing constraints, the latter reduces the negative effect.
Beck et al. (2011)	• If Chile had Canada's supervisory approach, the probability that a firm reports bank corruption as a major obstacle would drop by 2.5 percentage point. If Chile had Canada's private monitoring approach, then the same probability would drop by 3 percentage points. If Chile were to move on both fronts, then the same probability would decrease by 5.3 percentage points.
Cull, Demirguc-Kunt, and Morduch (2011)	• The cost of complying with regulations in the United States is 12–13 percent of banks' non-interest expenses. For micro-finance institutions, a speculative statistic is that the cost of compliance with prudential regulations reaches 5 percent of assets in the first year and then 1 percent for following years. • Micro-finance institutions facing regular onsite supervision have a level of financial self-sufficiency that is 0.18 percentage point less than that of other micro-finance institutions. However, correcting the sample selection bias with the Heckman procedure makes this result insignificant. • Supervision is associated with increases in loan sizes almost two times the average income of the lowest quintile. So outreach is curtailed and restricted to relatively safer clients. Also, more staff members are sent to headquarters, weakening field staff numbers.
Love and Mylenko (2003)	• Comparing average financing constraints between 1 and 4 (i.e., 4 being access to finance as a major obstacle to firm's operations) in countries with no private credit registry (i.e., 3.04 out of 4) with those that have private credit registries (i.e., 2.57), the authors find a statistically significant difference that suggest moving from a nonregistry country to a registry country reduces financing constraints by 0.47 percentage point or 40 percent of one standard deviation. Public registries have smaller effects. Firms also rely more on banks for financing in countries with private credit registries.
Brown, Jappelli, and Pagano (2009)	• An increase in information sharing index from the sample minimum (0) to the sample maximum (4.6) leads to a 0.41 unit increase in the proxy for access to credit. This increase is quite sizable as it amounts to 24 percent of the sample mean of the access indicator. Although the authors find no evidence for a differential effect of information sharing across firm size, they do find evidence that transparent companies benefit less than opaque firms. In addition, they find that the effect of information sharing is higher in countries with weaker creditor rights.

Love and Martinez Peria (2012)	• The probability of an average firm having access to finance (i.e., access to loan, line of credit, or overdraft) decreases by 5 percentage points in response to a one standard deviation increase in the Lerner index (i.e., a proxy for competition in which higher values indicate less competition). This average effect varies by the level of financial development, the presence of credit information institutions, and the presence of government banks. • While the same scenario (i.e., one standard deviation or a 0.07-unit increase in the Lerner index) leads to larger reductions (8 percentage points) in the probability of access to finance, in countries with average financial development, the reduction in probability is halved (4 percentage points). In financially developed countries, no impact is detected. • In response to the same scenario, the probability of access to finance would have been 13 percentage points lower in countries with low information sharing. No significant association is detected in countries with high information sharing. • Decreasing competition is not associated with access to finance when governments are not involved in finance. However, if the government presence is significant, then the same scenario leads to a 10 percentage point reduction in the probability of access to finance.

| Table 13. Determinants of Financial Development ||
E. All Aspects of Financial Development	
References	**Empirical Findings**
Barth, Caprio, and Levine (2012)	• The capital regulatory index has no effect on banking sector depth and efficiency but a negative effect on banking stability (i.e., NPLs). Specifically, a one-unit increase in the capital regulatory index leads to a 1.9 percent decrease in the NPL ratio. A one-unit increase in the private monitoring index reduces the NPL ratio by 3 percent, increases private credit by 0.5 percent, and reduces overhead costs and net interest margin by about 0.7 percent. • The official supervisory index has no effect. Whereas entry restrictions increase overhead costs and net interest margins (by 0.4–0.5 percent), restrictions on banking activities reduce banking depth and raise net interest margins (by 0.6 percent and 0.5 percent, respectively). • If government-owned banks are controlled for, the effects of capital and official supervision are zero. Only private supervision leads to reductions in overhead costs, and activity restrictions lead to higher net margins and lower banking sector depth.
Podpiera (2006)	• The effect of quality of regulation and supervision (i.e., measured by compliance with the Basel Core Principles) on banking sector stability (NPLs) and efficiency (net interest margin) is quantified as follows. If an emerging economy could push its quality of regulations to the average for advanced countries (a 15-unit increase), then NPLs would decrease by 0.05 percentage points and net interest margins would decrease by almost 0.10 percentage points.

Cull and Effron (2005)	• Reforms aimed at improving bank regulation and supervision are associated with substantial reductions in the private credit ratio (7 percentage points per adjustment loan). The improvement in M2/GDP is significantly larger for borrowers than for nonborrowers (5 percent versus 3 percent). • When the selection problem is corrected, borrowers seem to have outperformed nonborrowers by a wider margin. Simple averages indicate that the matched nonborrowers sample had slower growth in M2/GDP (2 percent versus 4 percent per year), less reduction in Cash/M2 (1 percent versus –2 percent per year) and concentration (–2 percent versus –3 percent), and more rapid increase in spreads (5 percent versus 1 percent) than did borrowers. Matched nonborrowers did, however, have more rapid private credit growth (4 percent versus 3 percent).
Giustiniani and Kronenberg (2005)	• On average, a 10 percentage point increase in the ratio of compliance with IMF conditionalities leads to a 0.03 percentage point increase in return on assets, about a 2 percent increase in the ratio of private credit to GDP growth and 1.4 percent in the ratio of deposits to GDP growth.
Detragiache, Gupta, and Tressel (2008)	• An increase in the foreign share of banking sector assets by one standard deviation leads to a decline in the ratio of private credit to GDP of about 6 percentage points. This is about a third of the average ratio of private credit to GDP in the sample. • A one standard deviation increase in the foreign share would lead to a decline in the growth rate of credit of about 20 percent. This scenario does not hold in developing countries. • In developing countries, the presence of foreign banks is associated with lower overhead costs and net interest margins. Specifically, a one standard deviation increase in the foreign share of assets in the banking sector is associated with reductions of 0.68 and 0.31 percentage points in overhead costs and net interest margins, respectively. • A one standard deviation increase in foreign bank presence leads to 2.40 percent less demographic branch penetration (bank branches per population), 6.8 percent decrease in geographic branch and ATM penetration , a 41 percent decrease in loan accounts per capita, and a 270 percent decrease in deposit accounts per capita.
La Porta, Lopez de Silanes, and Shleifer (2002)	• Government ownership has negative effects on financial sector deepening, access to finance, banking sector efficiency, and stability. Moving from the average of government ownership in countries with French legal origins to the average of those with English legal origins (a decrease of approximately 30 percentage points) raises the ratio of private credit to GDP by 1.22 percentage points and liquid liabilities by 0.45 percentage point. • The same scenario leads to a 9.7 percentage point increase in private claims of firms outside the top 20 relative to GDP and a 17.84 percentage point increase in loan availability. In terms of efficiency, the same scenario leads to a 0.72 percentage point increase in the ratio of overhead costs to total assets and a 6.87 percentage decrease in the interest rate spread. • In terms of stability, the same scenario increases the stability index by 38 percent. Capital market development is more heavily tied to government ownership of banks, as the same scenario leads to a 22.9 percentage point increase in stock market capitalization.

Table 14. Causes and Consequences of Pension/Insurance Sector Development	
References	**Empirical Findings**
Impavido, Musalem, and Tressel (2003)	• A 1 percentage point increase in the share of contractual savings in total financial assets leads to a 1.89 percentage point increase in the ratio of stock market capitalization to GDP. A shallower effect is found on the depth of the bond market. No effect is seen on stock market liquidity. A 1 percent increase in contractual savings assets leads to a 2.21 percent increase in stock market capitalization in countries with market-based financial systems; in bank-based countries, the same increase leads to a 1.07 percent increase in bond market capitalization. • The effect on stock market capitalization is larger in countries with mandatory pension systems (i.e., 3.39 percent). Also in those countries, there is a significant effect on stock market liquidity (2.52 percent) as well as on bond market capitalization. In addition, the contractual savings assets have a significant effect on stock market liquidity in countries with better accounting standards. Note that the sample is mostly OECD countries but includes a few emerging economies.
Walker and Lefort (2002)	• Specifically, a 1 percent increase in the ratio of pension funds assets to GDP leads to a 0.9 percent decrease in the cost of capital, measured as dividend yields, and increases the price-to-book ratio by 0.9 percent. At the same time, market volatility decreases by 0.2 percent.
Hu (2012)	• A 1 percent increase in the ratio of pension assets to GDP decreases the ratio of deposit money bank assets to deposit money and central bank assets by 0.05 percent in less developed economies in the sample but not in developed countries. • Pensions have no effect on net interest margins in richer Asian countries but they have negative effects in the less rich countries (i.e., a 0.5 percent reduction in net interest margin). • In terms of the stock market, pension fund growth leads to improvements in stock market liquidity and capitalization in all countries (0.2–0.7 percent) for market capitalization in rich versus less rich Asian countries and 0.5–1.33 percent for value traded. • In the bond market, pension fund growth has an effect on private and public bond markets: a positive relation in the public bond markets for low-income countries (0.12 percent), and a larger effect in the private bond markets (0.19 percent).
Meng and Pfau (2010)	• A 1 percentage point increase in pension fund financial assets relative to GDP, on average, leads to increases of 0.30 and 0.625 percentage points in stock market capitalization and stock value traded, respectively, while private bond market capitalization relative to GDP increases by 0.094 percentage point. • Splitting the sample into countries with high and low financial development, a 1 percentage point increase in pension fund financial assets over GDP in countries with high development leads to an increase in market capitalization and value traded of 0.397 and 0.488 percentage points, respectively. Private bond market capitalization increases by 0.114 percentage point. There are insignificant impacts in countries with low financial development.

Hu (2005)	• A 1 percentage point increase in pension assets leads to a 0.04 percent increase in bank development. This positive relationship exists only for the emerging market economies, not for OECD countries.
	• The effect of pension assets on deposit money bank assets as a share of total financial assets is positive and significant in emerging market economies (again, usually insignificant and negative in the OECD sample).
	• Both in the long run and in the short run, pension funds growth leads to a larger stock market with more liquidity, which is both statistically significant and economically meaningful: a 1 percent increase in pension asset growth to a 0.4 percent increase in private bond market capitalization, a 0.3 percent increase in public bond market capitalization, and a 0.2 percent increase in stock market capitalization in the emerging market economies.
	• Across all countries, a 1 percent increase in pension assets leads to a 0.3 percent increase in stock market capitalization, a 0.3–0.8 percent increase in stock market value traded (short- to long-run), and a 0.95 percent increase in stock market turnover in the long run.
Beck and Webb (2003)	• A 1 percent increase in banking sector development leads to a 1.82–2.29 percent increase in life insurance development. In contrast, a 1 percent increase in institutional development leads to a 0.79 percent increase in life insurance development.
Feyen, Lester, and Rocha (2011)	• Countries with private sector–dominated insurance sectors exhibit significantly more insurance activity (i.e., a 16.8 percentage point difference in the ratio of total insurance assets to GDP).
	• In concentrated markets, insurance assets are 8.8 percent of GDP versus 25.4 percent in nonconcentrated markets.
	• The ratio of life insurance premiums to GDP is almost twice as large in the high creditor rights group (2.03 percent versus 1.14 percent).
	• Financially more developed countries exhibit significantly more insurance activity. For example, the ratio of insurance assets to GDP is only 3.5 percent in the group with low ratios of credit to GDP versus 31.5 percent in the group with developed credit markets.
	• A 1 percent increase in the log of private credit to GDP is associated with a 1.12 percent increase in life insurance premiums, implying that deeper credit markets spur personal loans, which often require life insurance as collateral.