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Financial Development:
Regulating for
Economic Growth

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Introduction

The role of the financial sector in economic growth as an object of inquiry had been inquired by early scholars. Remarkable examples are found in Bagehot (1873), Schumpeter (1911), Robinson (1952), and Gurley and Shaw (1955). Despite this, it was not until the nineties that the discipline really took off. Since then, both theoretical literature and empirical research have developed rapidly.

The reason behind this academic interest lies in the possible policy ramifications that would arise from a clearer understanding of the discipline. Indeed, this significance is also highlighted by Ross Levine, one of the most established and prolific scholars in the finance and growth literature: "information about the impact of finance on economic growth will influence the priority that policymakers and advisors attach to reforming financial sector policies." (Levine, 2004, p. 1).

In the current state of affairs, "many central banks work with dynamic stochastic general equilibrium models that do not include a banking sector" (Allen & Carletti , 2010, p. 10). These models assume that the real economy functions efficiently by itself, while the only use for financial systems is to price assets efficiently (MuellBauer, 2010). It follows that regulation on the matter is more of a series of answers to accidents rather than the implementation of a clear regulatory design. In order to overcome an aleatory state of financial supervision, a thorough investigation of finance's influence over economic growth is imperative.

To this end, the initial section of the thesis delves into the academic theories explaining the finance-growth nexus. The bulk of the literature presented suggests that more

developed financial systems cultivate innovation and enhance the allocation of resources, thus stimulating growth.

Section 2 discusses the recent empirical literature which presents the nexus betwixt financial deepening and economic growth as non-linear (Loayza & Ranciere, 2006)[1] or non-monotonic (Arcand, Berkes, & Panizza, 2012, 2015)

Section 3 delves into a qualitative analysis of financial development. The central question this section aims to address is: "when does finance help ordinary people and when does it take advantage of them?" (Zingales, 2015, p. 13). While the preponderance of evidence suggests that financial development spurs economic growth, it is fundamental to discern growth-promoting finance from rent-seeking components. To discourage the latter, awareness must be spread. Thereby, the section will underline inefficient, if not fraudulent, financial practices at the outset. Finally, the section will focus on possible regulatory responses.

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[1] They find the relationship between financial deepening and economic growth to be negative in the short-run, mainly due to financial crises, while being a positive relation in the long-run.

1. | The Benefits of Finance to Growth

The complex nexus between the financial sector and economic growth has been a subject of extensive discourse, embracing sundry, and frequently conflicting, theoretical and empirical perspectives. Already Walter Bagehot (1873) stressed the pivotal role of British finance in catalyzing industrialization in England, while Alexander Gerschenkron (1962) further contended that a well-developed financial system constitutes a critical prerequisite for industrialization.

Conversely, Joan Robinson (1952) professed an alternative stance, asserting that financial deepening is solely a consequence of economic development. Hence, the emergence of financial instruments, institutions, and services is merely a response to the demand for such entities by investors and savers.

Hugh T. Patrick (1966) reconciles the two standpoints suggesting that both the "supply-leading" and "demand-following" phenomena arise sequentially in the real-world economy. At first, finance spurs investments in innovation, thus kindling economic growth. Consequently, once the real economy has consolidated, the "demand-following financial response becomes dominant" (Patrick, 1966, p. 177).

While all the previously mentioned academics address the relation between the financial system and growth, economic development and finance remained distinct branches until the nineties. Levine (2021) identifies the emergence of finance and growth literature as a result of the convergence of two strands of research: (a) the endogenous growth models proposed by Romer (1986; 1990) and Aghion and Howitt (1992), which provided analytical frameworks for the investigation of potential determinants of economic growth; (b) financial economics models that analyzed how market frictions motivated the

development of finance, subsequently influencing managerial incentives, corporate governance, and resource allocation. Noteworthy contributors to this second strand include Jensen and Meckling (1976), Stiglitz and Weiss (1981), Fama and Jensen (1983 a, b), Diamond and Dybvig (1983), Diamond (1984), Myers and Majluf (1984), and Grossman and Hart (1986).

1. 1. | Functional Theory

The emergence of financial systems "to ameliorate transaction and information costs, […] naturally influence the allocation of resources across space and time" (Merton & Bodie, 1995, p. 12). Levine further secerns this primary function into five, arguing that "financial systems: (a) facilitate the trading, hedging, diversifying, and pooling of risk, (b) allocate resources[2], (c) monitor managers and exert corporate control, (d) mobilize savings, and (e) facilitate the exchange of goods and services" (Levine, 1997, p. 691).

As a result, financial development ensues when financial instruments, markets, and intermediaries perform more effectively their functions, thereby cutting information, transaction, and enforcement costs.

1. 1. 1. | Amelioration of Risk

The first function of the financial system to influence resource allocation, hence growth, is that of risk amelioration. Financial instruments, markets, and institutions provide savers the possibility to mitigate liquidity risk, improve intertemporal sharing of risk, and enhance cross-sectional diversification of risk. Indeed, in the absence of a financial system, investors would not be provided the option to trade and diversify risk. They will

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[2] In following works, Levine specifies that the function consists in the production of information "ex ante about possible investments" (Levine, 2004, p. 5) and the allocation of capital.

thereby avoid investments in high-return activities, which in turn could potentially affect adversely economic growth.

In order to fully comprehend the functioning of finance in ameliorating risk, I proceed to categorize two types of risk: (a) unsystematic risk, and (b) liquidity risk.

Unsystematic risk is associated with individual projects, companies, industries, and other micro-economic factors. Financial instruments, markets, and intermediaries afford investors the means to effectively trade, pool, and diversify risk. Extensive scholarly discourse underscores that, by providing vehicles for cross-sectional diversification, financial systems profoundly influence resource allocation and saving dynamics. Consequently, capital is channeled towards endeavors characterized by higher expected returns, thereby catalyzing the enhancement of economic growth.[3]

Additionally, King and Levine (1993b) find that financial systems that facilitate risk diversification can also affect growth by fostering technological change. The scholars elaborate a model in which individuals and entities persistently seek to make technological progress to secure a profitable niche in the market. Nonetheless, in doing so, agents face risks inherently associated with innovation. However, King and Levine argue that the ability to maintain a "diversified portfolio of innovative projects can reduce the risk of investing in innovation." (Levine, 2021, p. 19). Consequently, financial systems that improve diversification opportunities promote technological development, effectively boosting economic growth.

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[3] Acemoglu and Zilibotti analyze the nexus between risk, diversification, and economic growth. Their model assumes that: (a) high-return ventures frequently involve indivisible assets and substantial initial investments; (b) individuals are risk averse; (c) lower-return, safer alternatives are available, and (d) capital is scarce. They find that "productivity endogenously increases as the diversification opportunities improve." (Acemoglu & Zilibotti, 1997, p. 745).

Besides reducing unsystematic risk, financial systems may also mitigate the risks associated with liquidity. In the context of this study, liquidity denotes the ease and cost of converting financial assets and securities into purchasing power at agreed-upon rates. Therefore, liquidity risk emerges due to the uncertainties in exchanging financial instruments into readily available means of exchange.

Similarly to unsystematic risk, liquidity risk obstructs economic development by discouraging investors from committing their savings to high-return projects. This is because, while savers are prone to retain control over their investments, high-return endeavors often require a substantial, and protracted commitment of capital. Logically, unless the financial system enhances liquidity for such long-term ventures, suboptimal quantities of capital will be provided to high-return projects, hindering economic growth.

Levine (1991) constructs an endogenous growth model in which stock markets emerge to mitigate risk and catalyze economic growth. The model expands upon the endogenous growth literature and builds upon the frameworks in which financial contracts arise as optimal responses to the informational and risk characteristics of an economy[4].

In the model, savers can either invest in a liquid, low-return project or an illiquid, high-return one. Following the decision, a portion of savers face unexpected shocks, prompting those affected to seek early access to their invested funds. The risk of premature capital withdrawal before the illiquid project starts producing creates an incentive for investing in liquid projects, hindering economic growth and technological innovation.

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[4] See Diamond and Dybvig (1983), and Diamond (1984).

Furthermore, the model posits that verifying whether an individual experiences a shock is exceptionally costly. This assumption precludes the feasibility of state-contingent insurance contracts and therefore incentivizes the development of financial markets.

Levine (1991) shows how markets can counteract liquidity risk by inserting the option to sell equity in the framework: savers can trade their claim in the profits to other investors, providing firms and savers continuous access to capital. Furthermore, since markets are impersonal, participants will not face informational costs in verifying whether agents received shocks or not. As markets facilitate trade, they reduce liquidity risk, thereby fostering investment in illiquid, high-return projects.

While Levine (1991) analyzes the impact of markets on growth, Bencivenga and Smith (1991) focus on banks. They develop a growth "model in which the equilibrium behavior of competitive institutions (banks) affects resource allocations" (p. 195), thereby influencing real rates of growth. They find that banks, by offering an adequate mix of liquid and illiquid projects, can both satisfy demands on deposits and facilitate long-run investments in innovation, thus expediting economic growth.

Aghion, Angeletos, Banerjee, Manova (2010) shift their focus towards the production side of the economy rather than savers. They construct a model where firms have two investment options: *short-term investment*, which generates output (and liquidity) relatively quickly, and *long-term investment* (e.g., R&D) which contributes more significantly to productivity growth but takes more time to complete.

Primarily, they argue that underdeveloped financial systems lead to a procyclical allocation of long-term investment. A cyclical composition of investment leads to two additional predictions.

Firstly, because *long-term investment* tends to have a more substantial impact on productivity compared to *short-term investment*, tighter credit constraints exacerbate procyclicality in the economy's growth rate. Specifically, "the cyclical behavior of the composition of investment mitigates fluctuations when financial markets are perfect, but amplifies them when credit constraints are sufficiently tight" (Aghion, Angeletos, Banerjee, & Manova, 2010, p. 247).

Secondly, because tighter credit constraints heighten the liquidity risk associated with *long-term investment*, they reduce the tendency to engage in such ventures.

These findings suggest that financial frictions, particularly prevalent in economies with underdeveloped financial systems, reduce mean growth and increase volatility. Notably, unlike other models of financial frictions, these results are not driven by cyclical patterns of aggregate saving and investment. Instead, they are influenced by the cyclical composition of investment.

1. 1. 2. | Allocation of Capital

One of the key functions of the financial system is allocating society's savings to firms and individuals. In order to reach an optimal allocation of capital, it is imperative to collect and assess information on possible investments. It is fundamental to note that, while informational differences characterize numerous markets, they are particularly pronounced in financial markets. Borrowers cannot be expected to be entirely truthful

about their moral rectitude and quality of their projects, since exaggerating positive qualities may be considerably profitable. Unless abundant and reliable information is available, savers will be reluctant to invest, possibly impeding the optimal allocation of capital.

The process of gathering and analyzing information is significantly costly. In the absence of financial intermediaries, each investor would have to face these high search costs, making them a significant impediment for individual agents. The inability of individual savers to monitor perfectly causes deserving, high-value firms to be underfunded, while possibly leading underserving firms to earn rents.

Groups of individuals may form financial intermediaries conducting informational searches about potential investments on behalf of others, thereby economizing on information acquisition costs and addressing informational asymmetries. Consequently, financial intermediaries potentially steer funds towards the highest valued users, thus positively impacting resource allocation. Indeed, Goldsmith noted that the "financial structure of an economy accelerates economic growth and improves economic performance to the extent that it facilitates the migration of funds to the best user" (Goldsmith, 1969, p. 400).

Academic research also delved into the scrutiny of stock markets in shaping information production. In particular, this analysis highlights how liquid markets reduce transaction costs and profit opportunities deriving from the acquisition of new, relevant information

on firms. Therefore, large, liquid financial markets create an incentive for investors to research firms (Levine, 2021).[5]

Finally, Robert Merton theorizes that, in the presence of large, liquid markets, the acquisition of private information can be more easily disguised and exploited to profit off of it by trading on the markets. The result is an incentive in informational research with positive ramifications for capital allocation (Merton, 1987).

1. 1. 3. | Corporate Governance

Other than contributing to efficient capital allocation, financial systems function as a monitoring instrument for firms. Creditors effectively monitoring firms positively influence savings and capital allocation. The underlying rationale is that, when investors effectively monitor firms, managers are pushed to maximize firm value, improving resource allocation and spurring economic growth. Inversely, the absence of financial systems may obstruct the flow of capital toward profitable investments and hinder the mobilization of savings (Stiglitz & Weiss, 1983).

In order to comprehend the emergence and influence of financial intermediaries in corporate control, it is imperative to delve into an analysis of the agency problem. The agency problem constitutes a fundamental aspect of the contractual view of the firm, as articulated by Jensen and Meckling (1976), and Fama and Jensen (1983a, b). At its core, the agency problem arises from the separation between control and ownership.

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[5] In his research, Levine refers to academic literature by Grossman and Stiglitz (1980), Holmström and Tirole (1993), and Kyle (1984).

In the case where financing involves small, numerous investors, these investors are often inadequately informed to effectively exercise their control rights. Furthermore, due to each shareholder having a lack of expertise and a small stake, a free-rider problem may arise.

The free-rider problem faced by single investors renders gathering information about the enterprises they financed or participating in governance activities undesirable. Consequently, the effective control rights of managers – and thus their discretion in allocating funds – become considerably broader than they would have been if the financiers were actively engaged in meticulous contract enforcement (Shleifer & Vishny, 1997). Therefore, ineffective monitoring and lack of control leads managers to act in their own best interests, leaving firm value behind, with adverse effects on resource allocation and economic growth.

Having a large, concentrated owner, instead, avoids entirely the free-rider problem. Indeed, large owners have both the interest in overseeing managers and the authority to curb managerial discretion (Grossman & Hart, 1980; Shleifer & Vishny, 1986). However, concentrated ownership gives rise to a fundamental issue: large investors represent their own interests, which need not align with the interests of other stakeholders. Therefore, large investors, in pursuit of their own welfare, can redistribute wealth – both efficiently and inefficiently – from others. They can do so by outright expropriating resources from the firm (e.g. paying themselves special dividends), or by exploiting other business relationships with related parties (e.g. providing them jobs, or generous business deals), as underlined by Shleifer and Vishny (1997).

Related evidence on the relationship between the ownership structure of a firm and its profitability, as measured by Tobin's Qs, is provided by Morck, Shleifer, and Vishny (1988). They find evidence of a significant nonmonotonic relationship. At first, as a shareholder's ownership is in the range between 0 and 5 percent, Tobin's Q increases; after the 5 percent threshold is exceeded, profitability declines. One possible interpretation – consistent with the role of incentives in mitigating agency costs – is that performance initially improves with higher ownership concentration. However, as ownership exceeds a certain threshold, large owners attain near-complete control to prioritize the exploitation of firms by engaging in rent-seeking activities, thus stymieing economic growth.

Given the obstacles posed by high ownership, as well as exceptionally dispersed ownership, financial intermediaries may emerge to oversee firms and managers. Firstly, intermediaries pool savings from numerous individuals. In turn, these savings are loaned to firms, upon which the intermediary shall perform monitoring and enforce corporate governance. Therefore, the financial intermediary assumes the role of "delegated monitor", economizing on aggregate monitoring costs and avoiding the free-rider problem (Diamond, 1984).

Bencivenga and Smith (1993) further demonstrate that financial intermediaries, by economizing on monitoring costs – hence enhancing corporate governance – alleviate credit rationing and stimulate productivity, capital accumulation, and ultimately, economic growth.

Additionally, Levine (1997; 2004; 2021) argues that financial intermediaries foster innovative activities by bearing monitoring expenses, which are notably costly in the

innovation sector. As a result, credit allocation among competing technology producers improves, thereby positively affecting economic growth.[6]

While scholars generally support that financial institutions positively affect corporate governance, the same cannot be said about financial markets. The debate as to whether liquid markets improve or weaken institutional monitoring remains ambiguous.

One perspective posits that liquidity facilitates the concealment of informed trades, thereby increasing both the likelihood of monitoring – hence corporate governance – and trading profits. Indeed, the cost of monitoring can be recuperated thanks to the ability to purchase shares in the open market at a cost that does not yet fully reflect the firm's value (Maug, 2002).

By contrast, Roosenboom, Schlingemann, and Vasconcelos (2014) find that "stock liquidity weakens institutions' incentives to monitor management decisions" (p. 2392). The more liquid the markets, the lower the costs of exit. Therefore, investors, rather than face costly monitoring expenses, have an easy way out of their "unhappy" investments. Shareholders are thus discouraged from effectively influencing the firm to achieve better returns and will simply sell out (Bhide, 1993). Furthermore, reduced exit costs also encourage more diffuse ownership, giving rise to agency problems.

1. 1. 4. | Pooling of Savings

An integral part of the financial system is that of pooling (or mobilization), thus the aggregation of household wealth to fund indivisible or efficient-scale enterprises.

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[6] Levine (1997; 2004; 2021) refers to the model developed by de la Fuente and Marin (1996).

Accordingly, a lack of access to multiple investors would restrict many production processes to economically inefficient scales (Sirri & Tufano, 1995).

The barriers to the performance of mobilization primarily stem from transaction costs and informational asymmetries. To provide further clarification on the former, Levine (1997) references Carosso's (1970) *Investment Banking in America: A History*. Specifically, Levine highlights how investment banks had to employ "a vast sales force that traveled through every state and territory selling securities to individual households" (p. 699). This, in addition to other diverse and intricate means to raise capital, entailed significant transaction costs.

Informational asymmetries are instead associated with persuading savers to relinquish control of their savings. To accomplish this, "mobilizers" are typically focused on establishing outstanding reputations or government backing.

Given the transaction and information costs associated with the pooling of savings from multiple agents, various financial arrangements may emerge to alleviate these frictions and facilitate mobilization. The fundamental arrangement consists of *multiple* bilateral contracts, prescribing the economic relationship between a set of capital providers and one of productive units. This multilateral conception of pooling gives rise to entities that mediate between households and firms – financial intermediaries – and economize on the transaction and information costs of *multiple* bilateral contracts (Sirri & Tufano, 1995).

Financial developments that lower costs and improve mobilization can significantly impact economic development. Apart from the effect on capital accumulation, enhanced savings mobilization can both enhance resource allocation and stimulate technological

innovation. Acemoglu and Zilibotti (1997) demonstrate that financial arrangements capable of mobilizing savings from numerous individuals and investing in a diversified portfolio of risky projects, enable a reallocation of investment toward higher-return activities, thereby leading to positive impacts on economic growth.

1. 1. 5. | Facilitating Exchange

The last growth-promoting function of finance identified by Levine (1997) is that of facilitating exchange. Financial arrangements that reduce transaction costs have the potential to stimulate specialization. With greater specialization, workers are more inclined to devise better machines or production processes, thus stimulating productivity.[7]

Greenwood and Smith (1997) formally model the links between exchange, specialization, and innovation. Firstly, they argue that market formation is endogenous and requires prior real development. Secondly, as markets develop, they foster specialization. This is due to the fact that a greater degree of specialization requires more transactions. Since financial development lowers transaction costs, greater specialization is incentivized, encouraging growth.

1. 2. | Empirical Literature

In this section, I will review some of the notable examples of empirical literature showing that financial deepening has a positive, monotonic impact on economic growth. The early body of research is principally composed of cross-country studies, with the seminal work being King and Levine (1993a). Subsequent studies employing time-series and panel techniques, examining regional or sectoral variations within countries have shown that

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[7] Levine references to Smith's (1776) *Wealth of Nations*.

the robust positive correlation between finance and growth found in prior research may also support a causal inference, suggesting that finance causes growth. More recent microeconomic analyses, leveraging well-defined proxies for financing constraints at firm and household levels, have advanced this argument further by elucidating specific theoretical mechanisms for how access to finance should impact economic growth (Popov, 2017).

Remarkably, Levine (2004) underlines a significant drawback in the existing literature: "there is frequently an insufficiently precise link between theory and measurement" (p. 38). Although this issue is acknowledged, due to specific methodological progress in empirical studies, his review, similarly to Popov's (2017), is organized around econometric approaches, rather than around studies that accurately quantify each of the functions emphasized by the theoretical framework. Therefore, I will structure the following empirical review according to the same approach.

1. 2. 1. | Cross-Country Studies

King and Levine (1993a) conducted a comprehensive study across 77 countries over the period 1960-1989, systematically controlling for various country-specific indicators known to influence economic growth, such as initial wealth, secondary school enrollment, and population growth. They utilized multiple proxies for financial development (e.g., *Private credit:* credit to the private sector normalized by GDP). Furthermore, they investigated theoretical channels through which finance affects growth, such as capital accumulation and total factor productivity growth. Their analysis revealed a strong and significant association between contemporaneous measures of financial development and economic growth.

Furthermore, King and Levine (1993a) attempted to determine a causal relationship between finance and growth by adopting a *post hoc* approach. Specifically, they examined how much of the cross-country variation in average economic growth could be explained by the initial level of *Private Credit* in 1960. Their regression indicated that the original level of *Private Credit* was a reliable predictor of subsequent economic growth rates over the next three decades.

As stressed in the review of the theory on finance and its implications for growth, financial markets can also perform functions that influence economic growth. Thus, Levine and Zervos (1998) examine the effect of financial markets on long-run economic growth. Specifically, they assess the impact of stock market liquidity (measured by the turnover ratio)[8] on capital accumulation, productivity enhancement, and overall growth. The study is built on a sample of 42 countries over the period 1976-1993[9]. Their findings – controlling for banking sector development, initial income, and other determinants of growth – suggest a positive and significant correlation between the initial levels of stock market liquidity and economic growth. Remarkably, their regression also suggests that stock market size, volatility, and international integration do not robustly correlate with growth. Therefore, they argue it is the ability to trade a stock, rather than the capacity of listing them, that facilitates efficient resource allocation, and subsequent growth.

1. 2. 2. | Cross-Countries Studies with Instrumental Variables

The first methodological progress aimed at establishing a causal impact involves employing instrumental variables to isolate the exogenous aspect of financial

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[8] The total value of shares traded relative to the stock market capitalization.
[9] Data sample from Demirguc-Kunt and Levine (1996).

development. The seminal studies by La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1996; 1997; 1998), hereafter referred to as LLSV, argued that the differences in the nature and efficacy of financial systems can be partly attributed to disparities in investors safeguards against insider expropriation, as evidenced by legal regulations and enforcement. The rationale stems from the contractual nature of financial transactions: a legal system favoring investors and effectively enforcing their rights is likely to foster financial development.

Firstly, LLSV find profound differences in legal origins: civil law jurisdictions give investors weaker legal rights compared to common law jurisdictions. The most notable contrast lies between common law nations, which provide relatively robust protections for both stockholders and creditors, and French civil law nations, which offer the least protection to investors. German and Scandinavian countries fall in an intermediate position. However, German and Scandinavian civil law countries rank highest in law enforcement, followed by common law jurisdictions, and lastly by French civil law nations.

Secondly, based on a dataset comprising 49 countries, LLSV find that nations with weaker investor protections tend to possess smaller and less diversified equity and debt markets. Indeed, the study reveals that French civil law jurisdictions have the least developed capital markets.

Expanding upon the law and finance literature, Levine (2001) and Beck, Levine, and Loayza (2000) apply LLSV legal origin indicator as instruments for *Private Credit*. They find that financial deepening correlates with hastier economic growth. Moreover, the

estimated effect of financial development on growth holds substantial economic significance, further reinforcing the case for a causal relationship from finance to growth.

Applying identical econometric techniques and datasets, Rioja and Valev (2004) find that financial development enhances growth in developed countries primarily by boosting productivity growth. In contrast, in less developed countries, finance stimulates growth by expediting capital accumulation.

Using a cross-country sample of 32 countries, Brown, Martinsson, and Petersen (2013) associate legal institutions with tangible activities that stimulate innovation and foster economic growth. They find that "strong shareholder protections and better access to stock market financing lead to substantially higher long-run rates of R&D investment" (p. 1517), particularly among smaller firms, boosting firm growth.

The interpretation of instrumental variables evidence is still up to academic debate. Levine, Loayza, and Beck (2000) argue that financial development enhances steady-state growth. However, Aghion, Howitt, and Mayer-Foulkes (2004) contest this interpretation, emphasizing that financial development dictates the pace at which countries converge to their steady-state values.

Additionally, the legal origin approach faces certain challenges. Notably, Rajan and Zingales (2003) tested various indicators of financial development for developed countries from 1913 to 1999. They argue that the legal system, being a structural factor, should have a relatively time-invariant effect on financial development. In other terms, measures of financial development should not strongly fluctuate independently of demand over time. However, their data suggests that countries were more financially

developed in 1913 compared to 1980, and only recently they have surpassed their 1913 levels. Interestingly, in 1913, France's stock market capitalization as a fraction of GDP nearly doubled that of the United States, despite the French Civil Code being less favorable to investors. However, by 1980, this scenario had dramatically reversed, with France's capitalization plummeting to a fraction of what the United States held. Similarly, in 1913, several continental European countries boasted greater financial development than the United States. These findings, contrary to the findings of LLSV (1996; 1997; 1998) for the 1990s, reveal that countries with Common Law systems were not inherently more financially developed in 1913, raising questions about whether legal origin fulfills the relevance condition for a valid instrument.

1. 2. 3. | Panel Studies

Transitioning from a cross-country to a panel setting offers several advantages. Firstly, it enables the exploitation of both time-series and cross-sectional variations in the data. Secondly, it allows for mitigating biases associated with excluding time-invariant country characteristics from the pure cross-country framework. Thirdly, the panel framework facilitates instrumenting all regressors, not solely financial development, resulting in more precise estimates of the finance-growth nexus.

However, there are three primary disadvantages to this approach. Firstly, the models used to analyze the data are typically models of steady-state growth. Therefore, panel data, which inherently lacks precision in representing long-term relationships, may result in an imprecise evaluation of the finance-growth nexus. Secondly, the effectiveness of the employed dynamic panel technique relies heavily on the availability of a sufficiently

extensive time span. Lastly, this approach is sensitive to outliers and minor model variations (Popov, 2017).[10]

The seminal studies employing panel generalized method of moments (GMM) estimators to examine how financial development affects growth rates are the already cited Beck, Levine, and Loayza (2000) and Levine, Loayza, and Beck (2000). They find that financial development maintains a positive and statistically significant effect on economic growth, closely aligning with findings from pure cross-country and instrumental variable regressions discussed earlier. Thus, the substantial and positive association between economic growth and *Private Credit* does not seem to be influenced by potential biases stemming from simultaneity, omitted variables, or unobserved country-specific effects.

To address the challenges associated with assessing long-term relationships in panel studies Using panel cointegration analyses[11] and data from ten developing countries, Christopoulos and Tsionas (2004) offer strong support for the hypothesis that long-term causality flows from financial development to growth, with no evidence of causality in the opposite direction.

Researchers have also utilized panel techniques to investigate stock markets. For instance, Rousseau and Wachtel (2000) explore the relationship between stock markets, banks, and growth. They estimate vector autoregressions (VARs) for a dataset of 47 countries with annual data spanning from 1980 to 1995. Their findings indicate that stock market

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[10] Popov references the IMF Working Paper by Giovanni Favara (2003).
[11] By testing for cointegration, which indicates the presence of a long-term equilibrium relationship, panel cointegration analysis helps alleviate the limitation of the panel framework in accurately capturing long-term relationships.

liquidity and the level of activity of traditional financial intermediaries have a prominent role in the expansion of output per capita.

Beck and Levine (2004) aggregate data over five-year periods to focus on longer-term growth factors. Their findings reveal a positive influence of both stock markets and banks on economic growth (validating the findings of Levine and Zervos (1998)).

Ang and Madsen (2012) utilize panel data covering 77 countries from 1965 to 2009 to examine the impacts of risk capital and private credit on stimulating knowledge production. They conclude that countries with more developed financial systems tend to exhibit greater innovation.

Pradhan, Arvin, Bennett, Nair, and Hall (2016) investigate the causal relationship between bond market development and economic growth across 35 countries from 1993 to 2011. They define bond market development as the significance and occurrence of public sector, private sector, and international bond issues. Additional covariates under consideration include the inflation rate, the real effective exchange rate, the real interest rate, and a measure of openness to international trade. Their findings suggest that bond market development and the four covariates may serve as long-term causal factors for economic growth.

Finally, Laeven, Levine, and Michalopoulos (2015) develop a Schumpeterian growth model in which entrepreneurs generate profits by developing better goods, while profit-driven financiers emerge to evaluate entrepreneurs. Their model introduces two innovative elements: (a) financiers invest in the costly, but potentially lucrative, endeavor of innovation themselves, seeking to improve methods for screening entrepreneurs; (b)

technological advancement renders each screening process less effective over time. The model predicts that without financial innovation, technological innovation and economic growth will eventually stagnate. To empirically validate their model, they construct a proxy for financial innovation based on the speed at which each country adopts a private credit bureau to exchange information about potential borrowers. They find that financial innovation enhances the pace of economic growth, particularly in less developed countries.

1. 2. 4. | Industry-Level Analysis

In their pioneering study, Rajan and Zingales (1998) investigate a specific mechanism through which financial systems may influence economic growth. They emphasize the crucial role of the financial system in screening and funding projects with positive net present value. A well-functioning financial system reduces the costs for deserving firms to acquire external financing. Consequently, industries that heavily depend on external finance for technological reasons are expected to benefit disproportionately from financial development compared to other industries.

To identify industries that are more dependent on external finance, Rajan and Zingales assume that: (a) financial markets in the U.S. are relatively frictionless; (b) in a frictionless financial system, technological factors influence the extent to which firms in an industry utilize external finance; and (c) the technological factors influencing external finance are constant across countries. This approach allows Rajan and Zingales to test a clear theoretical channel for how finance should affect growth, and incorporate both country and industry fixed effects, which help to neutralize the impact of unobservable

factors that are common to all industries within a country and to the same industry across countries.

Using data from 41 countries and 36 manufacturing industries during the 1980s, Rajan and Zingales find strong evidence that sectors relying more on external finance tend to experience significantly faster growth. Subsequent research corroborates the relatively stronger positive impact of financial development on the growth of industries heavily dependent on external finance.[12]

Beck, Demirguc-Kunt, Laeven, and Levine (2004) utilize Rajan and Zingales approach to investigate the links between finance, firm dimension, and economic growth. They highlight the inherent informational opacity and screening challenges associated with small firms. Consequently, financial systems that effectively mitigate informational asymmetries could yield disproportionately greater benefits for industries predominantly comprised of small firms due to technological reasons. Using cross-industry, cross-country data, their findings suggest that financial development has a substantial impact on the growth of industries that rely more on small firms for technological reasons. Moreover, "[t]his suggests that financial development accelerates economic growth by removing growth constraints on small firms and also implies that financial development has sectoral as well as aggregate growth ramifications" (Beck, Demirguc-Kunt, Laeven, & Levine, p. 2).

In a significant paper, Fisman and Love (2007) argue that external finance dependence may not be the most suitable industry-specific benchmark to consider. Instead, they

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[12] See Guiso, Jappelli, Padula, and Pagano (2004), Svaleryd and Vlachos (2005).

propose that financial markets influence industrial growth primarily through reallocating resources toward their most productive use. To test this hypothesis, Fisman and Love (2007) utilize data on the sales growth of large manufacturing listed firms in the U.S. during the 1980s to construct an empirical proxy for *growth opportunities*. Their rationale is that growth rates of financially unconstrained firms in the U.S. serve as a good proxy for the potential growth of their industries globally. Subsequently, they employ the same dataset as Rajan and Zingales (1998) to investigate whether financial development has a disproportionately larger impact on industries with promising growth prospects. Their findings indicate that financially developed countries experience accelerated value-added growth in sectors that grow faster in the United States. Moreover, they demonstrate that variations in industry-specific growth opportunities account for a larger share of variation in growth rates across countries with different levels of financial development compared to variations in industry-specific dependence on external finance.

In line with the theory of financial development mitigating informational asymmetries, Strieborny and Kukenova (2016), using data from 28 industries across 90 countries, discover that firms in industries dependent on close relationships with their banks to alleviate information frictions experience disproportionately faster growth in countries with well-developed banking systems.

Using the Rajan and Zingales (1998) framework, researchers have also examined the effects of financial liberalization on growth, aiming to address econometric concerns related to the reverse causality and omitted variables bias. Gupta and Yuan (2009) explore the impact of stock market liberalization on industry growth within a sample of 27 industries and 31 emerging markets. Their cross-sectional analysis reveals that

liberalization leads to an upsurge in industry value-added growth, investment, and average market capitalization. These findings align with the notion that market liberalization mitigates financing constraints. Notably, this effect on growth seems to stem from the expansion of existing firms rather than the entry of financially constrained new firms. Furthermore, in contrast with their cross-sectional findings, their within-industry results suggest that establishment growth in these industries remains unchanged post-liberalization.

To reconcile the two results, Gupta and Yuan argue that barriers to entry at both the industry and country levels may hinder new firms from uniformly benefitting from liberalization. Additionally, their analysis indicates that existing firms' growth is substantially higher in industries undergoing privatization following stock market liberalization. Hence, liberalization yields a more consistent growth impact when accompanied by reforms aimed at enhancing competition.

The cross-industry framework has also been employed to explore the impact of venture capital on growth. For instance, Kortum and Lerner (2000) demonstrate that the substantial expansion in venture capital financing during the 1980s and early 1990s corresponded with a significant increase in rates of industrial innovation. Indeed, their analysis reveals a strong association between increases in venture capital financing within an industry and substantially higher patenting rates.

Another significant inquiry pertains to the influence of non-bank finance on the establishment of new businesses. Popov and Roosenboom (2013) explore the impact of risk capital markets on growth using a database of 20 firms from 21 European countries from 1998 to 2008. They find evidence that venture capital investment positively affects

the rate of new business creation. Their findings indicate that, after accounting for country and industry characteristics, as well as the endogeneity of venture capital, venture capital plays a pivotal role in fostering growth by introducing new ideas to the market in the form of new companies.

1. 2. 5. | Regional Evidence

Research efforts have focused on making use of within-country regional heterogeneity deriving from the implementation of policies promoting financial development. This methodology was introduced by Jayaratne and Strahan (1996), who investigated the effects of banking sector competition on growth by capitalizing on variations in the timing of deregulation of local banking markets across states in the United States. These regulatory changes were similar in structure but occurred in different years across states, providing a natural experiment. The researchers' findings indicated that competition-enhancing regulatory reforms spurred economic growth by enhancing the efficiency of credit allocation while having minimal impact on lending quantity.

However, competition-enhancing banking reforms may be prompted by anticipation of future growth opportunities (unobservable to econometricians). To tackle this issue, Huang (2008) examines changes in growth rates for neighboring countries across state borders. These countries, being immediate neighbors, are presumed to be similar in both observable and unobservable conditions, and would likely follow comparable economic trajectories in the absence of changes in bank entry barriers. Their findings demonstrate that the primary findings of Jayaratne and Strahan (1996) persist even in this more stringent specification, albeit with a reduced magnitude of the impact of banking deregulation on growth.

The Jayaratne and Strahan method has also been applied to examine the relationship between bank deregulation across U.S. states and innovation, a crucial component of economic growth. Chava, Oettl, Subramanian, and Subramanian (2013) argue that interstate banking regulation, which bolstered the local market power of banks, reduced both the level and risk of innovation by young, private firms. Conversely, interstate banking deregulations, which diminished the local market power of banks, increased both the level and risk of innovation by young, private firms. Additionally, Acharya, Imbs, and Sturgess (2010) document that banking deregulation in the U.S. improved resource allocation, resulting in higher rates of statewide growth for the same level of growth volatility.

The French banking reforms of 1985 serve as another natural laboratory for investigating the impact of banking deregulation on growth. These reforms abolished subsidized loans and monthly ceilings on credit growth, unified banking regulation, and privatized several banks. Bertrand, Schoar, and Thesmar (2007) investigate the consequences of banking deregulation on the growth of the French economy. The authors find that the reforms resulted in increased firm-level productivity. Moreover, their findings indicate that following deregulation, banks were less inclined to bail out poorly performing firms, and raised the cost of capital for such firms. This resulted in lower industry concentration ratios and heightened rates of both entry and exit for firms: underperforming firms were more likely to exit the market, indicating enhanced efficiency in product markets.

Guiso, Sapienza, and Zingales (2004) analyze variations in financial development in an integrated market, Italy, across individual regions. They develop an indicator of financial development by estimating the regional effect on the likelihood that a household lacks

access to the credit market. Using this indicator, they find that financial development enhances the likelihood of individuals starting new businesses, increases competition within industries, stimulates firm growth, and hence enhances regional growth. However, these effects are less pronounced for large firms, which have greater access to funding beyond their local areas.

2. | A Non-Linear Relation?

In the previous chapter, I delved into the extensive literature highlighting the critical role of the financial system in fostering economic growth. However, more recent research has brought attention to significant nonlinearities in this relationship. For instance, De Gregorio and Guidotti (1995) found a positive correlation between financial depth and economic growth in high-income countries until the 1970-85 period, after which it turned negative. Similarly, Rousseau and Wachtel (2011) observed a diminishing influence of finance over time. Analyzing data up to 2004, their findings reveal a positive impact of finance from 1960-1989, which diminishes in the post-1990 period and eventually turns slightly negative. Arcand, Berkes, and Panizza (2012; 2015) investigated the threshold at which finance ceases to stimulate growth. Their research indicates that the "vanishing effect" of finance occurs when credit to the private sector reaches 100% of GDP. Therefore, in this second chapter, I will delve into a review of prominent research revealing non-linear dynamics in the finance-growth relationship, along with the potential explanations and channels underlying these phenomena.

2. 1. | Pre-Financial Crisis Literature

"When Levine (2004) completed his survey on finance and growth the profession was close to a consensus on the fact that finance does matter for economic growth" (Panizza, 2013, p. 8).[13] Nonetheless, some early studies challenged or nuanced this relationship. For instance, Demetriades and Hussein (1996) question the validity of prior empirical studies in assessing causality. Initially, they scrutinize the reliability of cross-sectional

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[13] Yet, uncertainties lingered regarding finance's role in convergence or steady-state growth. Aghion, Howitt, and Mayer-Foulkes (2004) argued that financial development speeds up the rate of convergence but does not significantly impact long-term growth.

studies, challenging the notion that positive cross-sectional correlations between financial development and economic growth inevitably imply causality. They argue that such correlations can be interpreted differently, the simplest of which would be reverse causality, echoing Joan Robinson's assertion that "where enterprise leads finance follows" (Robinson, 1952, p. 86). Hence, the mere existence of cross-sectional correlations between financial development and economic growth does not establish causality.

Subsequently, the scholars identify two key challenges to King and Levine's (1993a) attempt to establish causality. Firstly, they note that indicators of financial development within a country often exhibit temporal correlation. Consequently, the initial value of an indicator can serve as a robust proxy for its contemporaneous level, which is omitted from the equation. As a result, inferring anything beyond a contemporaneous correlation between growth and financial development from the King and Levine results is deemed invalid. Secondly, they highlight that the cross-sectional nature of the analysis fails to accommodate variations in causal patterns among different countries. It is plausible that finance may act as a leading sector in some countries while lagging behind others. Therefore, any causality result derived is only applicable on average, if at all.

Subsequently, Demetriades and Hussein (1996) re-examine the causality issue by employing a cointegrated time-series approach across 16 countries. Their findings reveal a consistent long-term relationship between measures of financial development and real GDP per capita across 14 nations. However, while they identify bidirectional causality in seven countries, they detect clear instances of reverse causality (from economic growth to financial development) in six cases (El Salvador, Greece, Pakistan, Portugal, South Africa, and Turkey). Moreover, their study underscored the variation in causality patterns

across countries, further emphasizing the pitfalls of statistical inference derived from cross-sectional country studies that implicitly assume homogeneity among diverse economies.

Similarly, De Gregorio and Guidotti (1995) find significant variations in the relationship between long-term economic growth and financial development across different nations. Furthermore, they present an alarming finding, revealing a negative correlation across twelve Latin American countries over the period spanning from 1950 to 1985, arguing that the latter is the result of financial liberalization within a poor regulatory environment.

The importance of institutional factors is further investigated by Demetriades and Law (2006) who analyze the variation in the growth impact of financial development across countries with varying levels of institutional development. Their study employs a dataset comprising a panel of observations for 72 countries over the period from 1978 to 2000, with countries categorized into high-income, middle-income, and low-income groups based on the World Bank classification. Their findings suggest that financial development yields more pronounced effects on GDP per capita when operating within a robust institutional framework. Moreover, they highlight that in low-income countries, the absence of sound institutions may impede financial development from delivering sustained long-term economic benefits.

Rousseau and Wachtel (2002) investigate whether the intensity of the relationship between financial development and economic growth is influenced by the inflation rate. Utilizing five-year averages of standard indicators of financial development, inflation, and growth across 84 countries from 1960 to 1995, their study employs a series of rolling panel regressions. Their findings reveal the presence of an inflation threshold for the

finance-growth relationship (estimated to fall between 13 and 25 percent). Once inflation surpasses this threshold, financial development no longer contributes to economic growth. Additionally, they observe that in low-inflation environments the level of financial depth exhibits an inverse relationship with inflation, and that disinflation is associated with a positive impact of financial depth on growth.

Zhu, Ash, and Pollin (2002) contest the validity of the findings put forth by Levine and Zervos (1996; 1998), who argued that "stock market liquidity is a robust predictor of real per capita GDP growth, physical capital growth, and productivity growth" (Levine & Zervos, 1996, p. 3). Instead, Zhu, Ash, and Pollin contend that Levine and Zervos' results are influenced by outliers in their model. While Levine and Zervos claim to have adequately addressed the outlier issue in their model, Zhu, Ash, and Pollin argue that their approach is fundamentally incomplete. They demonstrate that the statistically significant effects of the stock market liquidity variable vanish when employing a more rigorous set of controls for outliers. Their formal replication exercise further reveals that the significance of the stock market liquidity variable primarily stems from the contribution to the "Asian Tiger" economies.

Another non-linearity is presented by Deidda and Fattouh (2002). They apply a threshold regression model to King and Levine's (1993a) dataset and, in low-income countries, they find no significant relationship between financial development and growth. Inversely, in high-income countries, they observe a positive and highly significant relationship between these variables.

Another pivotal aspect in understanding the effects of financial deepening lies in examining the potential hazards associated with it. Contrary to prevailing beliefs, Rajan

(2005) argued that the expansion of a vast and intricate financial system may exacerbate systemic risk, thereby exposing economies to financial-sector-induced procyclicality, and heightening the likelihood of a "catastrophic meltdown" (p. 4).

Favara (2003) reassesses the analysis conducted by Levine, Loayza, and Beck (2000) employing a more extended and updated dataset from 85 countries in the period from 1960 to 1998. Like Levine, Loayza, and Beck, Favara utilizes both cross-section and panel estimators. However, the scholar contends that Levine, Loayza, and Beck's two-step GMM estimator may be prone to inaccuracies due to heteroskedastic errors.[14] To address this concern, Favara applies a one-step GMM estimator, which he argues to be more appropriate, revealing that the relationship between finance and growth is, at best, weak. Moreover, Favara uncovers evidence of nonlinearities within the data, indicating that finance only significantly impacts growth at intermediate levels of financial development. Additionally, when estimating the long-run relationship in the panel data, Favara finds no support for the notion that finance fosters growth. Instead, for some specifications, he observes a negative relationship.

Finally, Loayza and Ranciere (2006) acknowledge a discrepancy between the empirical literature examining the impact of financial depth on economic development, and another body of literature that identifies credit growth as a significant predictor of banking and currency crises.[15] In an attempt to reconcile these findings, they employ a panel error correction model to simultaneously estimate the short and long-run effects of financial development. Their findings reveal a positive long-run relationship between financial

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[14] Favara bases his argument on econometric literature by Arellano and Bond (1991) and Blundell and Bond (1998).

[15] The authors cite Kaminsky and Reinhart (1999).

intermediation and output growth, alongside a negative short-run relationship between the variables, primarily driven by financial crises.

2. 2. | Post-Financial Crisis Literature

The financial crisis of 2007 marked a significant turning point in perspective. In the aftermath of the crisis, concerns arose regarding the possibility that some countries might have financial systems that are disproportionately large relative to their domestic economies. Consequently, the relationship between finance and economic growth came under increased scrutiny.

Rousseau and Wachtel (2011) reexamined the robustness of the cross-country panel results presented in the seminal paper by King and Levine (1993a) concerning the relationship between financial development and economic growth. Their analysis revealed that the finance-growth relationship, priorly estimated on data from 1960 to 1989, vanished over the following 15 years. Subsequently, they test for potential causes for this phenomenon. Firstly, they pose that excessive financial deepening may concurrently weaken the banking system and stimulate inflationary pressures. To test this hypothesis, the authors scrutinize the relationship between finance and growth among countries that have or have not undergone financial sector crises. Their analysis reveals that if episodes of crises are excluded, the finance-growth nexus persists. Consequently, they argue that the observed weakening of the relationship over time stems from the increased occurrence of crises in later years. Furthermore, they posit that excessive financial deepening could stem from widespread financial liberalizations in the late 1980s and early 1990s, particularly in countries lacking the necessary legal and regulatory infrastructure to effectively harness financial development. However, their analysis

indicates limited evidence suggesting that liberalizations directly played a significant role in diminishing the impact of finance.

Beck, Buyukkarabacak, Rioja, and Valev (2012) highlight the tendency in prior empirical research to utilize aggregate credit measures that combine both enterprise and household credit, despite theoretical models often focusing solely on enterprise credit. In response to this disparity, the scholars aim to document the cross-country variation in household and enterprise credit and evaluate whether the two forms of credit exert distinct impacts on economic growth. After decomposing aggregate bank lending into lending to enterprises and lending to households across 45 countries, Beck, Buyukkarabacak, Rioja, and Valev reveal two main findings. Firstly, they discover that, while enterprise credit exhibits a significant association with economic growth, household credit does not. Secondly, their analysis reveals that the proportion of household credit tends to be higher in economically more developed countries, while regulatory policies and market structure appear to have no significant relationship with credit composition. Their findings provide insight into the non-linear findings of Rioja and Valev (2004), who demonstrated that the effects of financial development on growth are less pronounced in high-income countries compared to middle or low-income countries.

Arcand, Berkes, and Panizza (2012; 2015) investigate whether there exists a threshold beyond which financial development ceases to have a positive impact on economic growth. They utilize different types of estimators, including cross-sectional and panel regressions, as well as semi-parametric estimators across different data sets, encompassing both country-level and industry-level data. They find that the incremental impact of financial depth on output growth turns negative when credit to the private sector

reaches levels between 80-100% of GDP. Notably, the authors highlight how the threshold at which they observed financial depth transitioning into a negative effect on growth mirrors the threshold identified by Easterly, Islam, and Stiglitz (2000), where financial depth begins to exert a positive effect on volatility. Consequently, the scholars suggest that a plausible explanation for financial depth yielding diminishing returns is the potential for rapid credit expansion to increase macroeconomic volatility and cause banking crises. However, they also demonstrate that their findings cannot be solely attributed to poor institutional quality, macroeconomic volatility, or financial instability.

The research for a "too much finance" threshold has also been attempted by Beck, Georgiadis, and Straub (2014). Utilizing time-series data from 132 countries spanning the period from 1980 to 2005, they ascertain a threshold for private credit relative to GDP of 109%, beyond which further expansion of credit fails to stimulate growth. However, their estimations exhibit variability across different specifications, indicating that controlling for certain financial variables may alter the threshold at which finance ceases to foster growth. For instance, when accounting for the occurrence of banking crises, the threshold increases to 130% of GDP.

Cecchetti and Kharroubi (2012) also challenge the assumption of a monotonic relationship between finance and growth. Examining a sample of 50 advanced and emerging economies from 1980 to 2009, their analysis uncovers an inverted U-shaped relationship between financial development and productivity growth. Furthermore, they find that when employment in the financial system surpasses 3.5% of total employment, the finance-growth relationship turns negative. Their interpretation suggests that an

excessively rapid expansion of the financial sector attracts excessive physical and human capital, leading to overinvestment and overemployment.

A multitude of empirical studies have highlighted compensation premiums associated with working in the financial sector and have provided evidence suggesting that these premiums represent rents rather than returns to skills.[16] Indeed, if rents are collected within the financial sector, it signifies an oversupply of talent into finance compared to what is socially optimal. Consequently, the ineffective distribution of skilled labor between the financial sector and the real economy hinders productivity and growth.

Kneer (2013) delves into how the absorption of talent into the financial sector influences the productivity and growth of the real sector. Specifically, given that financial liberalization significantly impacts the skill intensity of the financial sector, Kneer examines whether financial reforms have differing effects across manufacturing sectors with varying reliance on skilled labor. Logically, a shift of talent towards finance would disproportionately impact real sectors highly reliant on skilled labor, such as R&D. Indeed, analyzing data from 13 European countries over the period from 1980 to 2005, Kneer finds that industries heavily reliant on R&D experience relatively slower growth following financial liberalization. As a result "financial liberalization disproportionally reduces labor productivity, total factor productivity, and value-added growth" in skill-intensive industries (p. 101). Consistent with this finding, Law, Chang, and Singh (2017), argue that the expansion of the financial sector may hinder innovative activities,

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[16] Philippon and Reshef (2009; 2012) reveal that in the decade preceding the financial crises, rents contributed to 30% to 50% of the differential between the financial sector and the non-financial sector. Goldin and Katz (2007) demonstrate that graduates employed in finance enjoy an earnings premium of 195% compared to other occupations. Both studies document a substantial increase in the proportion of individuals employed in financial services starting in the 1980s.

consequently hampering innovation-led growth. Employing GMM estimators on a sample encompassing 75 developed and developing countries from 1996 to 2010, they unveil an inverted U-shaped relationship between finance and innovation.

Zhu, Asimakopoulos, and Kim (2020) delve into determining the threshold at which the relationship between finance and innovation turns negative. Their analysis spans 50 countries over the period from 1990 to 2016. After controlling for banking crises, as well as the long-run effects of both the 2007-2008 financial crises and the European sovereign debt crises, they reveal a threshold for private credit relative to GDP of 60%, beyond which innovation exerts no significant effect on growth.

Demetriades, Rousseau, and Rewilak (2017; 2023) challenge the prevailing narrative in the non-linear empirical literature, which often attributes the weakening of the finance-growth relationship to the aftermath of systemic banking crises. Instead, they advocate for considering financial fragility as a crucial factor that hinders the potential benefits of financial development. Their argument posits that elevated levels of impaired loans can raise the cost of new credit for businesses and households, thereby undermining banks' ability to fund productive investments and economic growth, even in the absence of a "full-blown crisis". To investigate this hypothesis, they conduct cross-country regressions using data from 141 countries spanning the period from 2000 to 2014. Their findings reveal that both financial fragility and private credit exert negative impacts on GDP growth. Moreover, their analysis confirms that a high volume of impaired loans exacerbates the adverse effects of private credit on growth.

Finally, Andrianova and Demetriades (2018) identify three interrelated reasons for the possible failure of financial development in promoting economic growth. The first

hypothesis suggests that policies aimed at promoting financial sector development (e.g. deregulation) did not achieve the desired effect on growth because the empirical relationships observed in data from the early 1960s to the mid-1980s were not structural. Therefore, when policymakers attempted to utilize or manipulate these relationships, they ultimately broke down. The second hypothesis takes a political economy perspective, asserting that ruling elites in various countries have exploited financial development for their own profit. This often led to either financial underdevelopment, particularly in low-income countries, or the emergence of excessive financing, resulting in over-indebtedness. The third hypothesis focuses on institutional weaknesses, highlighting the failure of many countries to achieve a minimal threshold of institutional development, particularly in terms of contract enforcement.

3. | Regulating for Growth-Promoting Finance

Levine's (2021) assertion that financial development spurs economic growth [17] is certainly significant, but it's crucial to acknowledge the limitations of his review. While Levine provides a comprehensive overview of existing literature, it's noteworthy that much of the evidence he presents relies on outdated datasets that only extend up to 2005. This omission is particularly concerning given the growing body of research that has emerged since then. Indeed, the newer strand of research that emerged after the 2007 financial crisis has provided valuable insights into the finance-growth nexus, revealing nonlinear dynamics and enhancing our understanding of the relationship.

In particular, the findings of Demetriades, Rousseau, and Rewilak (2017; 2023) represent a turning point even for the "nonlinear literature". In fact, while prior research focused on how financial crises possibly weakened the finance-growth relationship, the authors revealed how private credit itself and financial fragility had negative impacts on GDP growth across 141 countries from 2000 to 2014.

Another crucial insight is provided by Beck, Buyukkarabacak, Rioja, and Valev (2012). Their disaggregation of enterprise credit and household credit, and the discovery that household credit has no significant correlation with economic growth is pivotal for assessing the effectiveness of financial systems and guiding potential regulatory interventions. This discovery should inform policymakers about the importance of controlling the dramatic rise in household credit while supporting the enterprise credit market (e.g. by avoiding credit rationing and incentivizing bank lending to enterprises).

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[17] Levine, *Finance, Growth, and Inequality*, 2021 (p. 8).

As a result, to this day the quantitative analysis of the finance-growth nexus remains divisive.

3. 1. | A Qualitative Evaluation of Financial Development

Zingales (2015) highlights a clear divergence in the perception of finance between academic economists and society at large. While economists typically emphasize the importance and beneficial role of finance in economies, societies often view finance with skepticism. Indeed, Zingales highlights that this skepticism towards finance has worsened in the aftermath of the 2007 financial crisis but is not a new phenomenon; it is rather a sentiment that has persisted throughout history. Zingales suggests that this "dissonance" arises from economists' tendency to overlook how finance, without appropriate regulations, can degenerate into rent-seeking behavior, wherein certain individuals or institutions exploit the financial system for their own profits at the expense of societal interest.

Khwaja and Mian (2011) provide a framework for empirical research on rent-seeking and corruption in financial markets. The model assumes that firms face diminishing returns to capital, and thus all firms should earn the same risk-adjusted return on capital in an efficient financial system. Rents are generated when distortions (e.g. agency costs) in the perfectly efficient intermediation system are exploited by active agents.

The model examines capital allocation in an economy with multiple firms with the production function $af(k)$, where a represents a firm's productivity and $f(k)$ is a function of capital. In an efficient market without distortions, firms invest capital such that the marginal product of capital equals the risk-adjusted required return on capital r. The marginal product of capital is given by the derivative of the production function with

respect to capital $f'(k)$. Each firm invests optimal capital k^* such that $af'(k^*) = r$. Solving for k^* we obtain that optimal capital investment for a firm with productivity a is
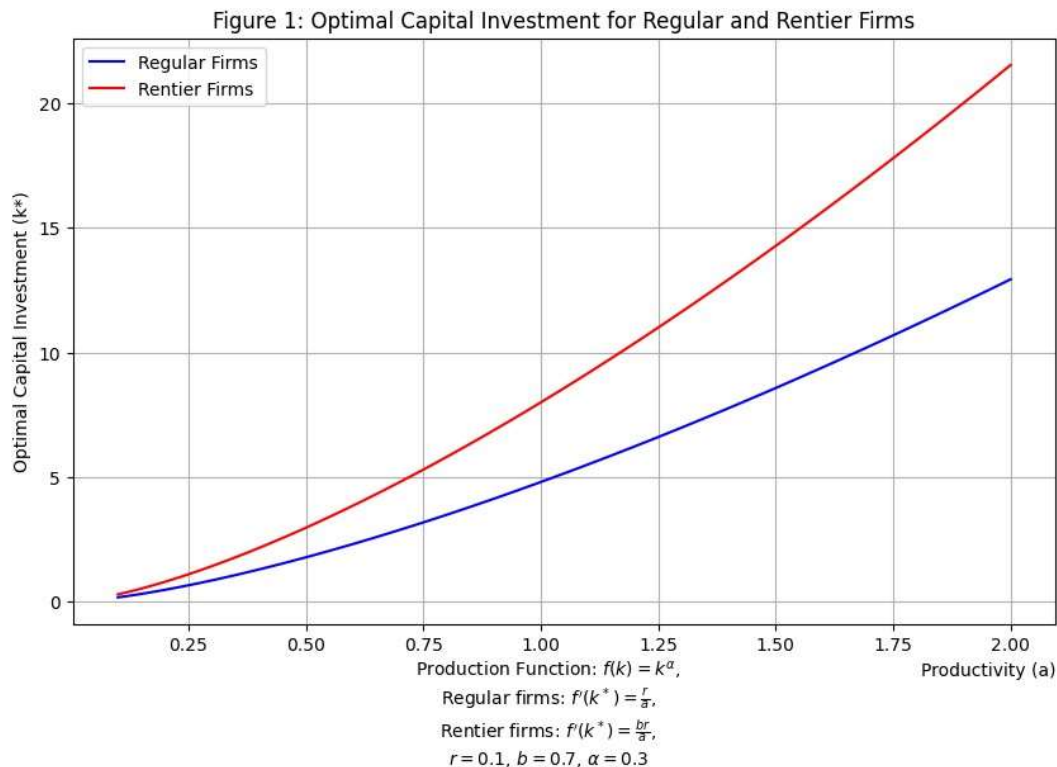
$$f'(k^*) = \frac{r}{a}.$$

To capture the extent of exposure to rent-seeking incentives, the authors create a parameter $b < 1$, with lower values corresponding to greater rent-seeking. A possible interpretation proposed by the authors is that parameter b represents the expectation that the central bank or the government will intervene and provide funds to a systemic financial institution in times of distress[18]. Certain firms (e.g. "too big to fail" institutions) have access to capital that requires only br return on capital. Consequently, rentier firms invest capital $(k^*_{rentier})$ such that $af'(k^*_{rentier}) = br$. Solving for $k^*_{rentier}$, we obtain that the optimal capital investment for rentier firms is $f'(k^*_{rentier}) = \frac{br}{a}$.

Comparing the capital investment of regular firms and rentier firms at the same productivity level a, we observe that rentier firms, benefiting from lower required returns on capital, always invest more capital than regular firms $(k^*_{rentier} > k^*)$. Furthermore, this difference in capital investment becomes even more pronounced as productivity increases.

To better illustrate these dynamics, consider Figure 1 which plots optimal capital investment (k^*) based on the level of productivity (a). I have assumed the production function to be a Cobb-Douglas $f(k) = k^\alpha$, with parameters $\alpha = 0.3$, $r = 0.1$, and $b = 0.7$.

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[18] Another interpretation of b provided by Khwaja and Mian (2011) pertains to financial systems in developing nations. These countries typically feature a banking sector largely owned by the government. Consequently, the cost of funds is notably subsidized through various mechanisms, the effect of which is mathematically represented by the parameter b.

Figure 1: Optimal Capital Investment for Regular and Rentier Firms

Production Function: $f(k) = k^\alpha$,

Regular firms: $f'(k^*) = \frac{r}{a}$,

Rentier firms: $f'(k^*) = \frac{br}{a}$,

$r = 0.1, b = 0.7, \alpha = 0.3$

While Khwaja and Mian (2011) offer a potential measure of exposure to rent-seeking incentives, disentangling rent-seeking from unobserved variables in empirical analysis remains challenging. A viable strategy to address this issue could firstly entail a qualitative approach aimed at uncovering the mechanisms of rent-seeking, and only subsequently a quantitative analysis evaluating the effects of the identified rent-seeking components. Therefore, following a similar approach, I will firstly delve into an examination of potentially damaging financial innovations, and subsequently analyze their estimated negative effects.

Financing innovation refers to the development of new financial products, services, or instruments. Traditionally, there has been a tendency to assume that financial innovation parallels innovation's positive impact on economic growth. For instance, former Federal Reserve Chairman Ben Bernanke (2007) emphasized "the enormous economic benefits

that flow from a healthy and innovative financial sector", highlighting the role of a sophisticated and deep financial market in promoting economic growth. However, in the aftermath of the financial crisis, financial innovation came under scrutiny for its potential role in exacerbating, and possibly causing the crisis. Particularly, two financial innovations came under scrutiny as potential catalysts for the financial crisis: collateralized debt obligations (CDOs) and credit default swaps (CDSs).

CDOs are structured financial products that bundle together various bonds and assets, promoting financial intermediation by pooling diverse assets into tradable securities. Indeed, without the CDO market absorbing their risk, some of the bonds composing them might never have been issued, thereby effectively expanding access to private credit. However, the issue arises from how CDOs can transform risky assets into seemingly safe investments, particularly through the creation of CDOs-squared, which are CDOs constructed from other CDOs. This process, endorsed by credit rating agencies, effectively masked the underlying risk of these securities, enticing investors to purchase them without demanding commensurate returns.

CDSs, on the other hand, are financial derivatives designed to insure a bond (or a CDO) against default risk. Similarly to CDOs, CDSs facilitated financial intermediation by encouraging investors to consider purchasing a bond with the assurance of a CDS protection. However, this dynamic relied on at least one party not fully comprehending the underlying risk profiles inherent in these transactions. Consequently, the cost of CDS protection was undervalued, prompting investors to engage in financial transactions they might have otherwise avoided if the CDS had been accurately priced.

Both instruments cited, CDOs and CDSs, are forms of financial derivatives. Derivatives are financial contracts designed to create exposure to market price changes in an underlying commodity, asset, or event. Therefore, the derivatives market offers an effective mechanism for sharing of price risks, aiding producers in managing price volatility. Additionally, derivatives play a crucial role in smooth hedging and risk management by enhancing capital inflows into emerging and developing countries. As a result, financial derivatives have achieved the most substantial growth among all financial markets over the past three decades; by 2012 the value of open positions in all derivative instruments was nine times the global GDP.

However, derivatives also negatively impact financial systems by introducing unpredictable crisis dynamics and acting as a driver of contagion, thereby posing significant risks to the overall economy. Financial derivatives, particularly over-the-counter (OTC), have been criticized for their lack of transparency, complex structures, and inadequate risk management. Lazový and Sipko (2014) offer a comprehensive survey on the potential negative effects of derivatives on the real economy. Subsequently, utilizing Granger causality tests, they investigate empirically the impact of exchange-traded derivatives (from 1986 to 2012) and OTC derivatives (from 1998 to 2012) on high-income countries. They find that OTC derivatives reduce economic growth and increase unemployment, while exchange-traded ones mainly reduce employment.

To better comprehend the detrimental impact of these instruments during the financial crisis, it's essential to understand the shift in bank's lending practices. Traditionally, banks would gather funds, meticulously assess borrowers, and then extend loans to approved applicants. If borrowers defaulted, the banks would incur the losses,

incentivizing them to thoroughly evaluate borrowers' creditworthiness, thus allocating credit efficiently.

However, securitization (bundling "passive" assets with cash flows and converting them into tradable securities) changed the banks' lending process from a relationship between banks and loan takers into one between anonymous financial markets and borrowers. A new model termed the "originate to distribute" model emerged.[19] Under this model, brokers and banks began originating mortgages and selling them off for securitization, thus bearing no long-term responsibility if borrowers defaulted. Furthermore, originators were compensated based on the volume of mortgages approved, incentivizing them to approve as many mortgages as possible. This excessive form of compensation thus led to moral hazard.

Subsequently, entities like investment banks pooled together mortgages from various locations to create diversified CDOs and Asset-Backed Securities (ABSs). These securities were then divided into tranches with varying levels of risk, depending on the specific tranche owned. The potential default losses would have been allocated from the most junior tranche (the riskiest) up to the most senior one. To ensure proper origination and sale practices, the most junior tranches were initially retained by the investment bank. Over time, however, all tranches were increasingly sold off, removing incentives for thorough due diligence, and inevitably leading to excessive risk-taking and rent-seeking by both originators and entities selling off the securitized loans. This behavior can also be traceable to the "too big to fail" problem, a form of moral hazard where systematically important financial firms engage in excessive risk-taking. The moral hazard arises

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[19] Allen & Carletti (2010).

because these firms would profit from successful risky investments while relying on government bailouts to avoid default. In essence, large financial firms can internalize profits and socialize the losses, thus incentivizing excessive risk-taking.

Purnanandam (2010) provides compelling evidence that banks heavily engaged in the "originate to distribute" market were responsible for originating notably lower-quality mortgages in the period prior to the 2007 financial crisis. His findings underscore the neglect of proper borrower screening by these originating banks, suggesting that their behavior played a substantial role in the precipitating crisis.

Epstein (2018) proceeds to estimate the costs of financialization on the US economy in the period between 1990 and 2005. Firstly, he focuses on the excessive profits (or rents) garnered by the financial sector, driven by anti-competitive strategies, the proliferation of overly complex and risky products, government bailouts, inflated pay and profits for bankers, and even fraudulent activities. The author estimates this cost to be between US$ 3.6 trillion and US$ 4.2 trillion. Secondly, based on the "too much finance" literature, he examines the costs stemming from misallocation, as in the diversion of financial and human resources away from more productive activities. In this instance, he approximates a cost ranging between US$ 2.6 trillion and US$ 3.9 trillion. Finally, the author estimates the costs directly attributable to the financial crisis itself, which he associates with speculative financial practices. This estimation places the final net cost somewhere between US$ 12.9 and US$ 22.7 trillion.

Furthermore, Epstein (2018) argues that while the Great Financial Crisis weakened mainstream economists' belief that unregulated finance is "efficient" and "benign", it only managed to dent the power of finance as an economic force, unlike the significant

restraint observed after the Great Depression. Indeed, despite a brief decline immediately following the crisis, the relative size of financial sector assets compared to GDP surged from 400% in 2008 to 500% by 2015. As the financial sector continues to expand, so do the opportunities to engage in rent-seeking activities, excessively attracting human capital from the real economy and effectively reducing its possibility of growth.

In parallel to analyzing dysfunctional behaviors that are nonetheless legal, Toms and Lin (2023) focus on white-collar crime. The authors argue that financial fraud and scandals arise from opportunities created by evolving financial systems. Specifically, they highlight that financial development, the significance of the financial sector, international capital mobility and secrecy, and banking stability all play a role in the prevalence of fraud and scandal. To measure the level of financial fraud and its changes over time, the authors create an annual fraud index. To assess financial development, they utilize indicators such as economic liberalization, stock market capitalization relative to GDP, credit as a percentage of GDP, and the financial sector's employment share. Their dataset includes yearly observations from 1900 to 2010 in the UK. They find that all measures of financial development show significant correlations with measures of fraud and scandals, indeed suggesting that a large, heavily leveraged, and deregulated financial sector tends to foster financial fraud and scandals.

3. 2. | Regulating against financial rent-seeking

Historically, the banking system has been one of the most regulated sectors in the economy due to market failures that result in external costs when a specific bank fails, affecting the entirety of the financial system and the real economy. Regulation aims to minimize the risk of bank failures and their negative impacts.

Generally, after financial crises, concerns about the fragility and risks of finance spur an intense debate on regulatory reforms, shifting the focus from self-regulation and reliance on market forces to discussions about reducing implicit subsidies and limiting the activities banks can undertake; this can possibly lead to overregulation, which in turn may impose unnecessary costs on financial service providers, reduce their efficiency, and ultimately hinder economic growth. The challenge has been to find the right balance between reducing fragility and maximizing the efficiency of financial intermediation. This has led to regulatory cycles where regimes are tightened after major crises and relaxed over time.

Beck, Carletti, and Goldstein (2016) argue that the Great Financial Crisis has not only raised doubts about finding the right regulatory balance but also questioned the nature of bank regulation itself. The authors suggest that the crisis has shown that focusing solely on the stability of individual financial institutions is insufficient to understand the fragility of the overall financial system. The conventional reforms after a crisis often aim at preventing the last crisis by closing loopholes and addressing sources of fragility. However, new regulations lead to evasion efforts by financial market participants. This feedback loop and catch-up process of regulators raise the fundamental question of how regulation can adapt to the dynamic nature of the financial system.

The fundamental tradeoff identified by Beck, Carletti, and Goldstein is between economic growth and financial fragility. On one side, banks and financial markets are essential for economic growth because of their role in reducing liquidity risk, producing information, and easing exchange. On the other side, these activities make financial institutions fragile by fostering a high degree of interconnectedness and creating significant externalities

when an individual institution fails. Therefore, the benefits of financial development on growth cannot be achieved without accepting some level of fragility and risk-taking within the financial system. Consequently, the regulatory focus should be on determining the optimal level of risk-taking and, more practically, on minimizing the repercussions of bank failures on the overall financial system and the real economy. "Critically, financial stability is not an objective in itself, but rather a condition for the sustainability of an efficient and market-supporting financial system" (Beck, Carletti, & Goldstein, 2016, p. 3).

3. 2. 1. | Regulatory Response after the Great Financial Crisis

In response to the perceived causes of the 2008 crisis, the U.S. enacted the Dodd-Frank Act (DFA) and the EU introduced the Basel III regulatory standards.

The DFA implemented several strategies, often delegating more detailed regulatory authority to administrative agencies. Firstly, to address excessive executive compensation that led to high-risk behaviors, the DFA empowered financial regulators to limit executive pay. Furthermore, broker votes on compensation were eliminated, shifting more power to shareholders. Secondly, regarding the "too big to fail" problem, the DFA aimed to restrict federal lending to large financial institutions, except in cases of liquidation. The underlying rationale was to signal financial firms that there would be no more bailouts. Notably, post-2008, the banking industry has become more consolidated as the surviving banks acquired failing ones, meaning the collapse of a "too big to fail" bank could be even more disastrous. This consolidation suggests that financial regulators might still circumvent the DFA's restrictions to bail out failing banks. Lastly, to address the risk

associated with OTC derivatives, Congress mandated the trading of these derivatives on exchanges and required the use of clearinghouses.

In the EU, Basel III introduced several key reforms aimed at enhancing the stability of the financial system. These include stricter capital requirements, a minimum leverage ratio, and two minimum liquidity ratios. Additionally, the EU implemented new rules for bank resolution and established the Banking Union.

Under Basel III, banks are required to increase the Common Equity Tier 1 (CET1) capital to at least 4.5% of risk-weighted assets. To address the "too big to fail" concern and systemic risk, Basel III also mandates various macro-prudential capital buffers. For instance, global systematically important banks (S-SIBs) and institutions (G-SIIs) must maintain higher capital buffers. In essence, these measures aim to ensure both a higher quantity and quality of capital.

To manage liquidity risk, the Basel Committee developed the Liquidity Coverage Requirement (LCR), and the Net Stable Funding Requirement (NSFR). The LCR requires banks to hold a sufficient stock of unencumbered High Quality Liquid Assets (HQLA) to survive for 30 days under a standardized stress scenario, ensuring short-term liquidity. The NSFR aims to reduce excessive reliance on unstable short-term funding for long-term or illiquid assets. It is calculated as the ratio of available stable funding (such as equity, long-term debt, and customer deposits) to the required stable funding over a one-year horizon, with assets weighted by their maturity.

Another significant financial reform in Europe is the establishment of the banking union. This union includes a Single Supervisory Mechanism (SSM), a Single Resolution

Mechanism (SRM), a Single Rulebook, and a harmonized deposit insurance scheme. Beck, Carletti, and Goldstein (2016) identify numerous rationales for creating a banking union: (a) to break the adverse feedback loop between sovereigns and the financial system; (b) to serve as a precondition for bank recapitalization through the European Stability Mechanism (ESM); (c) to create more distance between banks and regulators, thereby preventing regulatory capture; and (d) to enhance the effectiveness of supervision by implementing a "single rulebook".

3. 2. 2. | Shortcomings and Possible Solutions

While the regulatory reforms enacted so far have addressed significant issues, the crisis and its aftermath have presented new challenges in crafting an appropriate regulatory framework. A fundamental issue remains the "too big to fail" financial institutions. Beyond their systemic risk due to size and interconnectedness, Cetorelli and Goldberg (2014) argue that larger financial institutions pose a significant challenge for regulators also due to the complexity of effectively supervising their numerous subsidiaries. This complexity necessitates more sophisticated regulations, which can have unintended consequences. Haldrane and Maduros (2012) point out how complex regulation can incentivize financial institutions to become even more complex. Mariathasan and Merrouche (2014), examining a panel of 115 banks transitioning from Basel I to the more sophisticated Basel II requirements, found that a higher degree of complexity of regulations can lead to higher degrees of manipulation by financial institutions and investors.

Given these challenges, one might ponder if it would be socially profitable to break "too big to fail" banks into smaller financial institutions. Another more moderate approach

would be the introduction of a Pigouvian Tax levied on these "too big to fail" financial agents as a penalty for their systemic risk. The rationale would be to disincentivize these institutions from aspiring to become even bigger, while incentivizing them to reduce their size, thereby becoming less systemic. Indeed, this latter option has been further developed by Markose, Giansante, and Shaghaghi (2012).

Another key driver of systemic risk to be addressed is financial innovation. Indeed, innovations like securitizations and derivatives can reduce the idiosyncratic risk of individual financial institutions. However, they can increase systematic risk by enhancing the risk-taking capacity of banks. In fact, Brunnermeier (2009) identifies in CDOs and CDSs the enablers of the low lending standards that, in combination with cheap credit, resulted in the creation of the "credit bubble" leading to the 2007 financial crisis. To mitigate such risks, further raising capital requirements could be socially beneficial. Higher capital requirements would reduce the incentive to increase leverage through the use of controversial financial innovations. A dynamic and forward-looking approach to regulation in this case is essential. It is important to anticipate the next wave of innovations as they occur, requiring regulators to continuously adjust the regulatory perimeter and focus of prudential regulation as new sources of systematic risk arise.

Finally, another problem especially relevant in the U.S. would be regulating executive compensation in the financial sector. Coffee Jr. (2012) argues that the DFA fell short in its objective to curb executive compensation by allowing the firms alone to decide who caused "substantial losses" and requiring them too little data. Indeed, the DFA did authorize financial regulators to limit excessive compensation. However, in the few cases in which regulators required specific disclosure of executive's compensations, they

refrained from requiring any deferral of bonuses for executives causing losses, possibly due to concerns about employee defections to less regulated trading firms. A clearer and more detailed disclosure of bonus compensation would be a fundamental step in developing more effective rules to balance executive salaries with their performance.

Conclusion

This thesis has explored the intricate relationship between financial development and economic growth. Levine (2004) provides a comprehensive theoretical framework highlighting the positive contributions of a well-developed financial system, such as risk diversification, improved capital allocation, and enhanced corporate governance. In theory, these mechanisms facilitate innovation and productivity, thereby fostering economic growth.

However, I believe there to be a fundamental error in the interpretation of finance presented by the author. Rather than viewing finance as an instrument that can be utilized for both beneficial and detrimental purposes, it was viewed as an autonomous, self-regulating entity. The logical consequence of such a perspective is the belief that, if left to itself (guided by the "invisible hand") the financial system would inherently be beneficial, enhancing not only capital efficiency but also social welfare. Historically, the supremacy of the United States, the champion of this perspective, combined with the ideological fall of its counterpart in 1989, is how such an ideology established its primacy globally.

However, the Global Financial Crisis unambiguously attempted at the integrity of the belief in the social efficiency of an autonomous, deregulated financial system. Indeed, a review of the existing empirical literature reveals a division between pre- and post-financial crisis studies. On one hand, early research from the 1990s largely supports the notion that financial development is correlated with economic growth, leading academics to reach a near-consensus on this relationship and confirming the social efficiency of the "invisible hand".

On the other hand, the 2007 financial crisis prompted concerns that the financial sector had outgrown the real economy. This led to the emergence of the "too much finance" literature, which identifies various thresholds beyond which financial deepening no longer contributes to growth and may even impede it. The findings of Demetriades, Rousseau, and Rewilak (2017; 2023) mark a pivotal point in the financial development-economic growth literature, revealing how financial fragility has negative impacts on GDP growth even in the absence of a financial crisis. The fundamental tradeoff, therefore, lies between promoting economic growth and mitigating financial fragility.

Achieving this balance requires regulatory efforts, as unchecked financial development and innovation can easily lead to rent-seeking activities. Although significant progress has been made in financial regulation in recent years, a more forward-looking approach is essential. It is crucial to continuously adjust the regulatory framework and focus of prudential regulation to address new sources of systematic risk.

In 2023 the U.S. regulatory agencies proposed implementing components of the Basel III agreement, thereby extending broader capital requirements to banks with over $100 billion in total assets. Another significant change would be the removal of the organizations' internal models for credit and operational risk evaluation, which aims to standardize risk assessment across the industry. The Fed estimated that these changes would result in a 16 percent increase in common equity tier 1 capital requirements for the affected banks.[20] I believe this proposal is a step in the right direction for three main reasons. First, it could curb the excessive expansion of already systemic financial firms while simultaneously discouraging non-systemic firms from becoming systemic,

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[20] Board of Governors of the Federal Reserve System; Federal Deposit Insurance Corporation; Office of the Comptroller of the Currency (2023).

requiring firms a more cautious approach to their operations and growth. Second, as large banking organizations subject to the proposal will have to compete with non-affected firms, they will not be able to pass the entire cost of the stricter regulation onto borrowers. This could result in enhanced competitiveness and a reduction in financial fragility. Finally, adopting more standardized regulation across both the EU and the U.S. will prevent the American banking system from gaining a competitive advantage at the expense of financial stability. Given the global interconnectedness of the financial system, consistent regulations are crucial for maintaining global financial stability. Indeed, I believe the strong resistance to these regulations by the banking industry to be an indicator of their potential effectiveness in enhancing stability and reducing rent-seeking behavior.

Lastly, a fundamental aspect of classical economic development studies that is understudied in the finance-growth literature is income inequality. In recent years, income inequality in developed countries has risen significantly, prompting a critical examination of its underlying causes. The role of financial development in possibly exacerbating or mitigating this effect should be of primal importance when evaluating the role and the magnitude that the financial system should have in our economies. Furthermore, how much do financial fragility and crises affect income inequality? Only by clearly understanding the relationship between finance and inequality can technical regulators and democratic institutions effectively guide the financial system through the regulatory framework. This understanding is crucial to ensure that financial systems promote not only economic growth but also an equitable and inclusive development.

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