

INTERNATIONAL FINANCIAL MARKETS: A Diverse System Is the Key to Commerce

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INTERNATIONAL FINANCIAL MARKETS: A Diverse System Is the Key to Commerce

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EXECUTIVE SUMMARY

This paper provides a broad overview of the global financial system. It describes how financial institutions and markets in various financial instruments make up the global financial system, and the size of this system. It also discusses how the global financial system helps to boost economic growth and facilitates global trade. Ten main conclusions emerge from this analysis.

First, the global financial system is vast and varied; it consists of many different types of financial institutions, as well as financial markets in stocks, bonds, commodities, and derivatives. The global capital market involves 46,000 traded stocks worth over \$54 trillion. In 2012 the global bond market traded securities worth about \$80 trillion, and the mutual fund industry traded about \$26.8 trillion globally. Exchange-traded funds traded securities worth \$2 trillion globally in 2012, and at the end of 2013 the total notional amount of over-the-counter derivatives was about \$710.2 trillion globally.

Second, the global financial system promotes economic growth by:

- creating money and money-like claims;
- facilitating specialization and promoting trade;
- facilitating risk management, enabling individuals and firms to be insured against adversity in bad states of the world, thereby increasing investment and global economic growth;
- mobilizing resources globally and thereby improving the effectiveness with which local challenges are met;

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- obtaining information for the evaluation of businesses and individuals and allocating capital, thereby overcoming problems of asymmetric information that make it difficult or costly for individuals and firms to obtain capital; and
- increasing the set of opportunities available to companies, entrepreneurs, and individuals to participate in and contribute to global economic growth.

Third, the global financial system is highly interconnected. This interconnectedness increases its complexity and the need for international harmonization of regulation. For example, if U.S. banks are subject to more stringent regulation than banks elsewhere, there may be incentives for banking activities to migrate to jurisdictions with less stringent regulation. But failures in those jurisdictions can have global impact due to the interconnectedness that exists within the global financial system.

Fourth, firms use the global financial markets to raise capital. The depth and liquidity of the global financial markets help companies reduce their capital costs, improve access to financing, invest more, and grow. This report examines case studies for Novo Industri, a Danish pharmaceutical firm, and Bunge, a global agribusiness firm headquartered in White Plains, New York.

Fifth, financial architecture refers to the composition of a country's financial system, in particular whether it is bank-dominated or market-dominated. Development of the financial system—regardless of whether it is bank-dominated or market-dominated—helps economic growth. However, market-dominated financial systems are better at promoting technological and financial innovations.

Sixth, the global financial system promotes global trade through financing mechanisms outside the banking system, such as trade credit. Trade credit is the



extension of credit by a firm to its customers. Firms in more well-developed financial systems tend to use more bank debt relative to trade credit, and firms in less-developed financial systems use more trade credit. Thus, trade credit helps to make the global financial system more efficient by substituting for bank credit when such substitution is efficient. During 2005–11, global trade credit was approximately \$1 trillion annually, and the availability of trade credit benefits “Main Street.”

Seventh, large projects, including those for infrastructure, are often financed through private-public partnerships involving project financing. Power and transportation projects dominate this market, and private-public partnerships have been proven generally useful.

Eighth, banks as well as financial markets are regulated, and in both cases regulators face tensions in enforcing regulations that pull in opposite directions. Regulatory actions to achieve financial stability in the face of these tensions lead to greater interconnectedness in the financial system.

Ninth, bank regulation has multiple goals, and it is being increasingly harmonized, but the danger is that regulation may go too far. While regulation boosts economic growth to a point, beyond that point the costs to banks of complying with these regulations exceed the benefits to society. Thus, regulation beyond that point harms economic growth and employment. This is especially true when international regulators coordinate ineffectively and produce regulation in one jurisdiction that has ripple effects in other jurisdictions.

Finally, market-based financing, commonly known as shadow banking—financial intermediaries other than commercial banks (e.g., mutual funds, investment

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banks, and hedge funds)—is growing more rapidly than traditional banking. By year-end 2011, this sector was \$67 trillion globally. In the United States, market-based finance is twice as big as depository banking. Shadow banks provide firms and households with valuable economic services.



INTRODUCTION

The global economy is massive and growing. According to the World Bank, global Gross Domestic Product (GDP) had grown from \$71.83 trillion in 2012 to approximately \$74.91 trillion in 2013.¹ The United States accounted for over 22% of global GDP in 2013, but this percentage has been declining over time owing to the emergence of the economies in India, China, Brazil, and other developing countries. A sometimes overlooked factor in this global growth is that it is facilitated by ever-growing and increasingly complex economic interconnections between countries. Economist Frederick Hayek referred to this phenomenon as *Catallaxy*—specialization of tasks and functions that leads to the exchange of specialties among specialists and, consequently, economic growth. One can observe that Catallaxy is now occurring at the national level—some nations are specializing in fostering innovation in some industries, others are specializing in providing the infrastructure for large-scale manufacturing, and yet others are serving as hubs for the provision of services. The global flow of goods and services produced by this phenomenon is large. Manyika et al. (2014) report that the global flow of goods, services, and finance was almost \$26 trillion in 2012, or 36% of global GDP that year. *Figure 1* shows the growth of these flows over time.

1. See World Bank (2014).

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Figure 1. Traditional Flows of Goods, Services, and Finance Reached \$25.9 Trillion in 2012

Goods, services, and financial flows; share of GDP, 1980–2012
\$ trillion, nominal; %



Source: Comtrade; IMF Balance of Payments; World Trade Organization; McKinsey Global Institute analysis (Manyika et al., 2014).

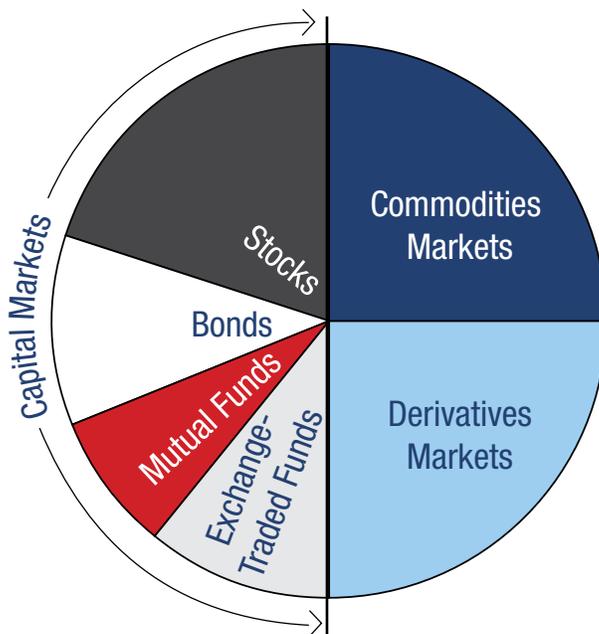
While such global flows increase the size of the global economic pie, they also engender greater interconnectedness among the financial systems of the world because an increasing share of global economic activity takes place across borders. The McKinsey Global Institute Connectedness Index measures the connectedness of 131 countries across all flows of goods, services, finance, people, and data and communication. It reflects the level of inflows and outflows adjusted for the size of the country. The data show that connectedness has been on the rise in most countries and that global *financial flows* accounted for almost half of all global flows in 2012. An important reason for this is the growing significance of the financial sector as a percentage of the overall economy in developed countries, and the development of financial markets in the emerging countries to support their rapidly growing economies and burgeoning trade flows.



This report examines how global financial flows promote economic growth and how the global financial system meets the needs of “Main Street.” The related issues of the role played by global financial institutions, their central banks, and the interconnectedness of these banks and their international regulation are also discussed. Shadow banking is a consequential component of this discussion. The growth of shadow banking is one of the most striking developments prior to the financial crisis of 2007–09, and its significance is underscored by the fact that many financial flows now occur outside the traditional depository banking sector.

At a very basic level, the global financial market links savers to investors across national boundaries by offering investors a vast array of investment products across a dazzling variety of financial markets. We can think of the financial market as consisting of the capital markets, commodities markets, and derivatives markets. See *Figure 2* below.

Figure 2. Global Financial Markets



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The *capital markets* consist of the markets for stocks, bonds, mutual funds, and exchange-traded funds (ETFs). At the end of 2012, according to the Bank for International Settlements, over 46,000 stocks were traded globally, and the global market consisted of more than \$54 trillion worth of traded stocks.² A *stock* is essentially an equity (or ownership) claim on the cash flows and assets of a company.

A *bond* is a debt security that represents a fixed-income claim on the cash flows and assets of a company. The global bond market was valued at about \$80 trillion in 2012, in terms of the aggregate value of the bonds traded. That means the global bond market was about 50% bigger than the global stock market in 2012.

Mutual funds are pools of cash collected from investors and invested in diversified baskets of traded securities. The securities include stocks, bonds, and other money market instruments. Mutual funds provide a very convenient and low-cost way for investors to diversify their portfolios across numerous industries and firm sizes. They initially came into prominence in the United States during the 1980s to provide investors with a means to earn high returns at low risk because Regulation Q ceilings on deposit interest rates prevented investors from earning adequate returns on bank deposits during periods of high inflation. Although not insured by the government, mutual funds provided investors with low risk due to diversification, with returns that were 5%–7% higher than attainable on (insured) bank deposits in the 1980s. This resulted in large flows from insured bank deposit accounts into mutual funds and spurred the growth of the industry. Today that is no longer the dominant motivation for the existence of the industry, but it is an industry that has nonetheless grown worldwide. The Investment Company Institute estimates that in 2012 the mutual fund industry had assets of about \$26.8 trillion globally, with the U.S. mutual fund market representing about \$13 trillion of that amount.

2. See Huntsley (2014).



Exchange-Traded Funds provide many of the same benefits as mutual funds. An ETF tracks an index, a commodity, or a basket of assets like an index (mutual) fund, but unlike a mutual fund, it trades on an exchange like an individual stock. By owning an ETF, an investor can obtain the diversification benefits of an index fund and can also sell short, buy on margin, and purchase small quantities (e.g., one share). ETFs have been around only since the 1990s, but they have experienced explosive growth, with \$2 trillion in assets as of year-end 2012.

Commodities markets offer investors the opportunity to invest in physical commodities. As such, they provide investors with diversification opportunities that go beyond those provided by the capital markets. About 50 major commodity markets exist worldwide, and they involve trade in about 100 primary commodities, including mined natural resources (gold, silver, oil, etc.) and agricultural products and livestock (soy, wheat, pork bellies, etc.). As of year-end 2011, commodity mutual funds—which provide investors with a way to invest in commodities without trading directly in the primary commodities themselves—had \$47.7 billion in assets,³ but this number is small compared with the size of global commodity markets. The monthly global trading volume in commodity futures and options markets as of year-end 2011 was almost \$11 trillion, and the total annual global sales in the spot market stood at about \$6.4 trillion.⁴

The **derivatives market** involves trade in *derivative contracts*. As the name suggests, these are financial contracts whose value is driven by the value of some other asset or security. Commonly used derivatives are forwards, futures, options, and swap contracts. The total notional amount of over-the-counter derivatives at the end of 2013 was about \$710.2 trillion globally.⁵

3. See ICI Research Perspective (2012).

4. See ICI Research Perspective (2012).

5. See Bank for International Settlements (2014).

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GLOBALLY INTERCONNECTED FINANCIAL MARKETS FOSTER GLOBAL ECONOMIC GROWTH BOTH DIRECTLY BY FACILITATING TRADE FLOWS AND INDIRECTLY BY INCREASING THE WEALTH OF INDIVIDUAL INVESTORS.



The large magnitudes involved in global financial markets reflect, in some sense, both the desire on the part of investors to invest globally and diversify across a growing number of securities and the constantly rising global trade flows. Thus, globally interconnected financial markets foster global economic growth both directly by facilitating trade flows and indirectly by increasing the wealth of individual investors that then enables them to increase their demand for goods and services and thus contributes further to global economic growth. But how specifically does the global financial system promote economic growth on Main Street?

The global financial system promotes economic growth in six ways: (1) by creating money and money-like claims; (2) by facilitating specialization and promoting trade; (3) by facilitating risk management; (4) by mobilizing resources globally and thereby improving the effectiveness with which local challenges are met; (5) by obtaining information for the evaluation of business and individuals and allocating capital; and (6) by increasing the set of opportunities available to companies, entrepreneurs, and individuals to participate in and contribute to global economic growth.

This report provides narratives of companies that raised their financing in global capital markets, and also discusses *financial system architecture*—the configuration of banks and markets in a given economy. It then discusses trade credit, a significant aspect of global trade. Project financing, typically used for large investments (often involving some form of private-public partnership) is also examined in this section.



Global financial institutions, the central banks that regulate them, the interconnections between these central banks, and the regulations that affect these banks all play a role in how companies access the global markets. This discussion highlights how highly interconnected different countries are, simply through the global financial institutions that operate in these countries. An event in one country may at first seem quite remote to those living in another country—such as the crash of the Japanese stock market may seem to Americans—but if it affects the banks in the affected country, then it can affect the lending behavior of those banks in other countries, thereby transmitting economic shocks across the globe through such interconnectedness.

Apart from interconnectedness, banks are also profoundly affected by the regulations to which they are subject, and bank regulation is increasingly being internationally harmonized, especially across Europe, Canada, and the United States. The report highlights key aspects of international regulation, with a focus on the microprudential regulation of banks. These regulations affect economic growth as well as the likelihood of economic upheavals through financial crises.

Market-based financing plays a large role in the global markets. The subprime crisis of 2007–09 originated in the United States in the housing finances system. The crisis turned the spotlight on shadow banking, not just in the United States, but globally. The business community and regulators have learned from the experience of the crisis, so behavior going forward will differ significantly from the set of events that precipitated the crisis. While the term *shadow banking* conjures images of shadows and mysteries—in part because the term has become a part of our lexicon only in the past few years—it simply refers to a host of nondepository financial institutions that connect savers and investors in the financial market. Former Chairman of the Federal Reserve System Ben

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Bernanke defined shadow banks as “financial entities other than regulated depository institutions (commercial banks, thrifts, and credit unions) that serve as intermediaries to channel savings into investment.”⁶ Such channeling occurs through securitization and secured funding techniques.⁷ The market-based financing sector is important not only because it provides significant economic services to the global economy by aiding capital formation for businesses, but also because it is large (and growing) and magnifies the interconnectedness of different countries’ economies. As of year-end 2011, the size of the global shadow banking sector was estimated at \$67 trillion. Moreover, because market-based financing involves investing in and borrowing against asset-backed securities, it creates interconnectedness between institutions and investors in one country and the assets that spawned the asset-backed securities in another country. For example, mortgage-backed securities created in the United States were held by banks all over the world prior to the subprime crisis, creating a scenario in which price movements in the U.S. housing market would potentially reverberate through many other countries. The market-based financing system is well understood as a vehicle for economic growth. In fact, in the November 2014 communique, G-20 leaders resolved to work in partnership to uplift growth, boost economic resilience, and strengthen global institutions—recognizing that well functioning markets support prosperity.

6. See Adrain and Ashcraft (2012).

7. See Bernanke (2010) and Greenbaum, Thakor, and Boot (forthcoming).



GLOBAL FINANCIAL MARKETS PROMOTE ECONOMIC GROWTH

The global financial system and the flows it facilitates affect global economic growth providing immeasurable benefits to individuals, companies, and societies. *Figure 3* shows the specific benefits.⁸

Figure 3. How the Global Financial System Promotes Economic Growth



Creates Money and Facilitates Its Flows

We normally think of money as being currency issued by the government. That kind of money, however, is only a component of what effectively functions as money in the economy. Four core institutions are actually engaged in the issuance of money and money-like claims in the modern financial system: the central bank, depository banks, dealer banks, and money market funds. Each type of institution issues a different kind of money-like claim, distinguished mainly by the assets backing these claims.⁹

8. This discussion is an expanded version of the discussion in Thakor (2011), which examined the interconnectedness of the domestic financial system.

9. This discussion is based on Pozsar (2014).

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Figure 4 below shows the hierarchy of money claims in the economy.

Figure 4. Hierarchy of Money Claims

	Money or Money-Like Claim Issued	Assets Backing Claim
Central Bank	Currency and reserves (liabilities of central bank)	Treasury bills (federal government debt), agency debt, and residential mortgage-backed securities (RMBS)
Depository Banks Issuing Insured Deposits	Insured deposits (liabilities of commercial banks)	Loans and deposit insurance
Dealer Banks	Repurchase agreement or repos (liabilities issued by dealers' credit trading desks)	Collateralized by corporate bonds, asset-backed securities, and private-label RMBS
Money Market Funds	Constant net asset value (NAV) shares	Commercial paper, Treasury bills, and other short-term assets
Depository Banks Issuing Uninsured Deposits	Uninsured deposits	Loans and securities

All of the money-like claims shown in *Figure 4* have one thing in common—they all promise to trade at par on demand. This is why they are called *money*. That is, one can effectively use them *like* currency in transactions, even though they are not all currency. Think of writing a check against your (insured) deposit balance in the bank. That check is being used by you as currency when you pay for something using that check.

Although these are all money claims, they are not equal in terms of how they are perceived and used. One aspect in which these claims differ is in the strength of the promise to pay at par on demand and par at maturity in all states of the world.

Currency and central bank reserves are at the top of the hierarchy as the safest claim because the assets backing them—Treasury obligations in the form of bills and bonds—are the safest. Next in the hierarchy are insured bank deposits. These are almost as safe because they are insured by a government agency, the Federal Deposit Insurance Corporation, which is in turn backed by the U.S. government. Next in the hierarchy



are repos, or repurchase agreements, which are secured claims and are a major form of money in the market-based financing that occurs in the shadow banking system. A repo is a contract whereby an institution borrows—typically on an overnight basis, although longer-maturity repos also exist—from another institution using eligible securities (e.g., mortgage-backed securities) as collateral. The term *repurchase agreement* is used because the contract involves “selling” the securities represented by the underlying collateral to the lender in order to raise the needed financing, and then literally repurchasing the security back, which is economically equivalent to borrowing using the securities as collateral and then repaying the loan to get the collateral back. Fourth in the hierarchy are money funds. These nondepository, market-based financing vehicles are backed by two types of assets: secured debt claims (such as repos) and unsecured debt claims. At the bottom of the money hierarchy are uninsured bank deposits, that is, deposits larger than \$250,000, which is the cap on the level of deposit insurance in the United States. These are essentially unsecured claims backed by (risky) bank loans.

The main point of this discussion is simple. Money is more than just the fiat currency in circulation. A host of institutions participate in the process of creating money and money-like claims, and these different types of monies are used for different (sometimes overlapping) purposes, that is, for different settlement purposes. For example, the net payments of dealers and money funds are settled using demand deposits, whereas net deposit flows between banks are settled through transfers of reserves between the reserve accounts of banks that are maintained at the central bank.

MONEY IS MORE THAN JUST THE
FIAT CURRENCY IN CIRCULATION.



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A second noteworthy point is that the creation of these different kinds of money claims facilitates transactions of various types in the economy, thereby fostering economic growth. Thus, we need the large variety of institutions described in *Figure 4* in order to ensure the creation and smooth flow of money in the financial system. Moreover, these various institutions are all interconnected in many ways, which means that we not only need variety in financial institutions, but we also need to be cognizant of how these institutions are related to each other.

A final point is that the more advanced an economy is in terms of its development, typically the greater the variety of money-like claims used for various transactions, and hence the greater the variety of financial institutions involved in the creation of these claims.

THE FINANCIAL SYSTEM ALSO FACILITATES GLOBAL TRADE BY WAY OF ALLOCATING LIQUIDITY FROM LIQUIDITY-SURPLUS AREAS OF THE WORLD TO LIQUIDITY-STARVED AREAS.



Facilitates Specialization and Trade

As indicated earlier, global trade flows are both large and growing. The financial system facilitates global trade in various ways, such as by providing the different kinds of money discussed above. Each plays a role in the global trade ecosystem. There are also offshore money market instruments like Eurodollars, which are a form of private money, like uninsured deposits. The financial system also facilitates global trade by way of allocating liquidity (money-like claims) from liquidity-surplus

areas of the world to liquidity-starved areas. For example, China's high savings rate led to the accumulation of large liquidity stockpiles left over after the country's investment needs were met during the past decade. This liquidity was used by the Chinese government to



buy U.S. government debt instruments, namely Treasury bonds. This, in turn, financed the debt of the U.S. government, which was used to meet the investment needs within the United States.

Specialization of tasks and functions across countries leads to differing demands for liquidity in different countries, as the global demand will also be different across tasks and functions. This means that the global financial system's ability to transfer liquidity from countries where the tasks and functions chosen for specialization exhibit a relatively low need for investment funds to countries that exhibit a higher need for investment funds is important for both the continued support of specialization and the encouragement of global trade.

Facilitates Global Risk Management for Individuals and Companies

Risk impedes investment by both individuals and companies. If a farmer is deciding how much seed and fertilizer to buy, he will worry about the vagaries of weather (rainfall, temperature, etc.) and future crop prices. In the absence of any sort of insurance against these future uncertainties, the farmer is likely to buy less seed and fertilizer and therefore harvest a smaller crop than he would if these uncertainties did not exist. This is because the farmer is naturally risk averse. In many countries (e.g., India), many (especially small) farmers operate without crop insurance, which often leads to personal ruin. This risk of ruin discourages farmers from investing as much as they could in farming. Similarly, companies are also deterred by risk, some of which may be related to regulation. One CEO of a capital-intensive firm mentioned that his company would cut back on investments in big projects due to uncertainty about future taxes because a project that looks good under current tax rates may look bad under higher future tax rates. Similarly, a local U.S. business

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may be deterred from entering a foreign market because all revenues would be in a local currency that has very high volatility with respect to its euro or dollar exchange rate.

THE DEEPER AND MORE LIQUID THE GLOBAL FINANCIAL MARKET IS, THE BETTER THE RISK MANAGEMENT OPPORTUNITIES FOR INDIVIDUALS AND COMPANIES.



One of the services provided by the global financial system is *risk management*. The farmer can purchase crop insurance or use commodity futures contracts to hedge the risk of uncertain future crop prices. Similarly, a global firm that is concerned about currency risk can use currency options and swaps to hedge some of that risk. The deeper and more liquid the global financial market is for these kinds of contracts, the better the risk management opportunities for individuals and companies, and hence the higher the level of

productive investment, with positive implications for economic growth.

As the global financial system evolves, it develops a greater variety of risk management instruments and processes. This enables individuals and firms to hedge against a growing variety of risks, benefiting not only them but also society because it enables them to invest more in economic growth. Consider U.S. farmers. Prior to crop insurance, the decline in net worth they suffered because of, for example, bad weather and hence a bad crop resulted in lower crop investments and lower future crop harvests. Crop insurance enables them to ride out these shocks and supply more food. Similarly, securitization of home mortgages enabled banks to better manage their risks and resulted in cheaper credit available to individuals to buy homes. And the advent of credit card securitization led to an explosion in the availability of unsecured, short-term credit to individuals. More recently, the securitization of solar panel installations in homes may



usher in an era of greater solar energy use, as securitization enables risks to be taken from solar panel companies and individuals and be priced and borne in the capital market.

Mobilizes Resources and Creates New Resources by Encouraging Innovation

The above discussion makes it clear that the global financial system, through the creation of money and money-like claims and the institutions that help to create and manage the flows of these claims, makes ever-growing global trade possible. This trade mobilizes resources in the sense that the specialized resources in one location or country can be deployed to produce a product or service for another location, even when little or no demand for that product or service exists in the country in which the resource is located.

This global mobilization of resources that the financial system facilitates manifests itself in cross-border commerce and exchanges that display connectedness across a large number of countries and cities. In a 2014 report, McKinsey examined 131 countries and ranked each country based on its connectedness in each type of flow (goods, services, finance, etc.).¹⁰ According to this analysis, Germany is the most connected country in the world; that is, it helps in the global mobilization of resources more than any other country. The second-, third-, and fourth-ranked countries are Hong Kong, the United States, and Singapore, respectively. Developed countries are much more connected than developing countries. This means that there is substantial scope for growth in the connectedness of countries in the future, and therefore for enhanced global mobilization of resources.

Participating in the global mobilization of resources is enormously beneficial to a country; hence, a global financial system that fosters this mobilization also boosts the economic growth of nations. Singapore is a good example of this. Although its population

10. See McKinsey Global Institute (2014).

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in 2012 was only 5.3 million people, Singapore had a GDP of \$275 billion, making it the 35th largest economy in the world—quite a feat for a country that small. It has achieved this success mainly by being a strong intermediary of flows moving between other countries, especially in goods and financial flows. It represents a major financial center in Asia, and it has made significant investments in infrastructure and education.

While the impact of the global financial system on the mobilization of resources and the growth of global trade is easy to see, what is perhaps less transparent is the impact that resource mobilization has on innovation. Two of the biggest impediments to innovation

are lack of funding and lack of talent or people. A strong global financial system helps to reduce these impediments. By making it easier for individuals and institutions to invest anywhere in the world, innovation can be funded even in areas of the world where there is a dire paucity of local resources. Moreover, as financial capital flows in to support innovation in a given region, it becomes easier to attract human capital to follow. Singapore again provides a good illustration of this idea. The country has developed a highly trained workforce and high-tech manufacturing facilities to transform lower-valued imports into higher-

valued exports, and has in recent years has focused increasingly on developing a stronger research and development ecosystem by allocating more funding to universities to attract internationally renowned, research-oriented faculty to help create research departments, laboratories, and so on. As a result, its value-added contribution in knowledge-intensive industries such as electronics, biotechnology, and pharmaceuticals is growing.

TWO OF THE BIGGEST IMPEDIMENTS TO INNOVATION ARE LACK OF FUNDING AND LACK OF TALENT OR PEOPLE. A STRONG GLOBAL FINANCIAL SYSTEM HELPS TO REDUCE THESE IMPEDIMENTS.





Obtains Information for the Evaluation of Businesses and Individuals and Allocates Capital

One impediment to the exchange of capital between savers and entrepreneurs and investors is that savers may have difficulty assessing whether a particular investment is worthwhile. If a private business comes to an individual and asks for money to grow, the individual is likely to say no for two reasons: asymmetric information and moral hazard. The asymmetric information problem is that the private business owner knows more about his own business than the individual saver does, and therefore has an incentive to misrepresent this information to obtain funding at favorable terms. For example, the business may overstate its growth potential and understate its true costs, thereby presenting an inflated picture of future profits. The moral hazard problem is that once the money is obtained, the business may not put it to the best use. For example, the manager in charge may waste money on a large office for himself, with plush carpets and expensive paintings. Or he may not work as hard as the shareholders would like, thereby putting his own desire for leisure above the interests of the shareholders. These two frictions—*asymmetric information and moral hazard*—may cause an individual saver to avoid investing in a private business that he does not know enough about.

Enter a private equity firm like Bain Capital. Its experts can conduct the appropriate due diligence to resolve the asymmetric information problem. Additionally,

INVESTMENT FROM THE PRIVATE EQUITY FIRM ALLOWS THE BUSINESS TO OBTAIN FUNDING AND GROW. PRIVATE EQUITY FIRMS ROUTINELY INVEST IN HUNDREDS OF COMPANIES, PROVIDING BOTH MANAGERIAL EXPERTISE AND MUCH NEEDED GROWTH CAPITAL.



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it can appoint its own employees to the business's management positions to resolve the moral hazard problem. Investment from the private equity firm allows the business to obtain funding and grow. Private equity firms routinely invest in hundreds of companies, providing both managerial expertise and much needed growth capital. For example, Bain Capital's decade-long investment in Domino's Pizza helped the company to expand, become more efficient, and add value to the economy. Similarly, private equity firms are buying up small health care providers, professionalizing their management, improving efficiency, and injecting

more capital. In the end, if health care has a brighter future, it is likely going to be because of these sorts of market-based initiatives.

Private equity firms, banks, venture capitalists, and a host of other institutions that make up the global financial system help Main Street to raise financing, fund growth, and create enhanced economic value in countless ways. A key component of their ability to accomplish these tasks is their expertise in resolving asymmetric information and moral hazard problems that impede the flow of capital from savers to businesses.

PRIVATE EQUITY FIRMS, BANKS,
VENTURE CAPITALISTS, AND A HOST
OF OTHER INSTITUTIONS THAT MAKE
UP THE GLOBAL FINANCIAL SYSTEM
HELP MAIN STREET TO
RAISE FINANCING.



Increases the Set of Opportunities Available to Companies, Entrepreneurs, and Individuals

The growth of the global financial system creates new opportunities for businesses and governments to drive economic growth, and it increases access for new participants, in addition to expanding opportunities for innovation. Of course, the benefits of the financial



system can be experienced by a country only if it is open to international financial flows, and the more open the country, the greater the benefit.

What is the source of the benefit? Research has shown that greater financial openness leads to a higher total factor productivity (TFP), where TFP is defined as a variable that determines how effectively an economy transforms productive inputs into output (GDP). Research has uncovered strong causal evidence that foreign direct investment and portfolio equity liabilities boost TFP growth.¹¹ Thus, one important effect of a deeper and broader global financial market is that it provides inducements for countries to open their economies to global flows as it becomes easier for the companies in these countries to tap the market for capital. As the benefits of participating in the global financial system increase, the implicit penalty for being left behind also increases. Companies in more and more countries will adapt their business models to an increasingly connected, competitive, and digitized world.

Vast opportunities for individuals and businesses are being created by the growing global financial system and global trade. McKinsey reports that for the 100 largest companies in the world that are headquartered in developed countries, only 17% of global revenue in 2010 was derived from emerging markets, even though emerging markets represented 36% of global GDP.¹² This means that there is still untapped growth potential and unharvested opportunities. This is further underscored by the fact that by 2025, emerging economies will contribute 70% to

VAST OPPORTUNITIES FOR
INDIVIDUALS AND BUSINESSES ARE
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GLOBAL FINANCIAL SYSTEM AND
GLOBAL TRADE.



11. See Kose, Prasad, and Terrones (2008).

12. See McKinsey Global Institute (2014).

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global GDP. Moreover, while in the past investment capital came mostly from the developed countries, in the future it will come from the developing countries. To support this claim, note that in 2000, developing countries had aggregate investments that represented 4.5% of global output, whereas savings were at about 4%. The gap between these two was the external finance that these countries needed for investment. Since 2000, however, developing countries have been saving more than they have been investing, generating an investible surplus of more than \$340 billion per year.¹³ This means that this growing pool of capital in the developing economies will continue to fund an increasing array of opportunities in the developed world.



HOW THE GLOBAL FINANCIAL SYSTEM MEETS THE NEEDS OF MAIN STREET

This section provides specific examples of companies that raised capital in the global financial market and how this capital fueled their growth. Such growth, in turn, increases employment and leads to a more prosperous society. The section then discusses the broader issue of financial system architecture and its link to economic growth.¹⁴ A discussion of trade credit, which is a key component of international trade and an important way in which the global financial system helps to meet the needs of Main Street, follows. The section ends with a discussion of project finance.

Novo Industri A/S

Novo Industri A/S (Novo) is a Danish multinational firm that produces industrial enzymes and pharmaceuticals.¹⁵ Prior to 1977, Novo was largely confined to Denmark, raising funds only locally. But its management realized that the Danish capital market was segmented from other capital markets—it displayed little interconnectedness—and lacked sufficient liquidity. This meant that Novo not only faced a high cost of capital, especially equity capital, but also did not have access to a plentiful supply of capital. These restrictions put it at a competitive disadvantage with respect to the multinational pharmaceutical firms it competed with, such as Eli Lilly from the United States and Gist Brocades from the Netherlands.

14. The term “financial system architecture” coined by Boot and Thakor (1997a), refers to the mix of financial institutions and markets in an economy.

15. This discussion is based on Moffett, Stonehill, and Eiteman (2009).

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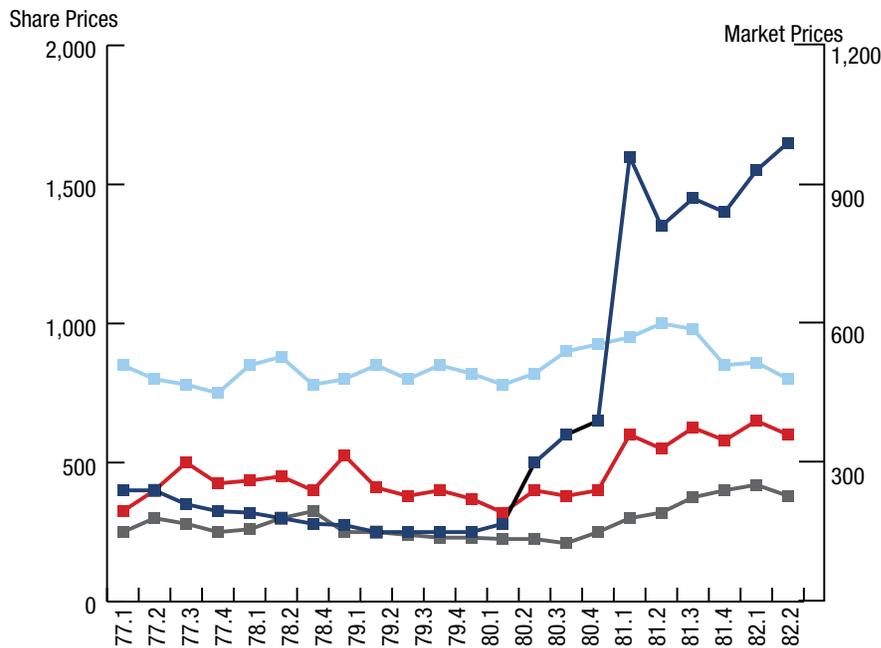
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Many features of the Danish equity market led to a relatively high cost of capital for firms seeking financing. One feature was asymmetric information. Denmark had a regulation that prohibited Danish investors from holding foreign private-sector securities, which gave little incentive for Danish investors to work to acquire information or to follow markets outside Denmark. Another problem that worsened the asymmetric information friction was the paucity of equity analysts. Taxation policy in Denmark did not help either. Investors were charged a capital gains tax of 50% on shares held for over two years, and gains on those held for a shorter period were taxed at a staggering 75% (the marginal income tax rate).

Novo saw significant growth opportunities on its horizon, for which it needed investment capital. It decided that it could no longer confine itself to the illiquid Danish capital market where equity capital was so expensive. So in 1977, Novo decided to access the global financial market. A big barrier the company had to overcome was asymmetric information. So it began disclosing its financials in accordance with international standards. In 1979, the company sold a \$20 million convertible Eurobond issue and listed its shares on the London stock exchange. This action encouraged equity analysts in London to follow the company and this reduced asymmetric information. That year also saw a big biotechnology boom in the United States and Novo decided to visit the United States to explore the market. Novo conducted a successful road show and U.S. investors began to purchase its shares on the London stock exchange. In 1981, Novo listed on the New York Stock Exchange and experienced an increase in its stock price as the proportion of share ownership of investors outside Denmark went from zero to about 30%. Novo's price-to-earnings ratio rose to 16, in line with the ratios enjoyed by its international competitors. Novo's stock price rose well above the Danish industry index, an indication that Novo had succeeded in its capital cost. *Figure 5* shows behavior of Novo's stock price.



Figure 5. Novo's B-Share Prices Compared with Stock Market Indices



Source: Stonehill and Dullum

An interesting aspect of this case study involves how the transition from a segmented capital market to a global capital market changes investors' reactions to capital-raising efforts. Novo's proposed share issue in the United States was greeted on the Danish stock exchange by a drop in its stock price. This is not surprising for a relatively illiquid stock market in which investors are worried about the dilution effects of the stock issue. By contrast, when trading started in New York, the stock price rose—a reaction one would expect in a liquid stock market in which investors believed that Novo would invest its capital at a rate of return exceeding its cost of capital.

A number of useful lessons emerge from this case study. First, segmented capital markets tend to be relatively illiquid and firms that are confined to raising their capital in

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such markets experience high costs of capital that can stunt their growth. When such firms decide to access the global capital market, they experience a decrease in their cost of capital, which helps their growth. Thus, global capital markets help Main Street by lowering the cost of capital for firms and helping them to grow faster. Second, global capital markets also level the playing field for firms vis-à-vis their large international competitors, by giving them access to the same low-cost sources of financing that these international competitors enjoy.

Bunge Corporation

Bunge Corporation is a global agribusiness firm. It trades in agricultural products, buys grains from farmers all over the world, and has crushing plants in which the grains are crushed to make oil, which is then sold to establishments like McDonald's. The company also makes and sells certain food products like margarine and mayonnaise.

BUT THE COMPANY WAS STILL PRIVATE, WHICH MEANT THAT IT DID NOT HAVE ACCESS TO THE FULL RANGE OF FINANCING POSSIBILITIES THAT TAPPING THE GLOBAL CAPITAL MARKET WOULD PROVIDE.



The company was founded in Amsterdam in 1818 as an export and import trading firm. In 1859, the firm relocated to Antwerp, where it became one of the world's leading commodities traders. In 1905, the company established an office in Argentina, a booming agribusiness market, and traded grains. In 1935, Bunge built its first major grain handling facility in the United States and became an originator of grain in North

America. The company entered Brazil in 1938, and became both a supplier (of fertilizers, financing, etc.) to and a customer (grains purchases) of farmers. The first soybean processing plant in the United States was built by Bunge in 1967.



The company continued to expand through the rest of the 20th century and management had even more ambitious growth plans that it wanted to pursue. But the company was still private, which meant that it did not have access to the full range of financing possibilities that tapping the global capital market would provide. Thus, in 2000, Bunge moved its global headquarters to White Plains, New York, to be closer to the heart of the global capital market, and in 2001, the company decided to go public by listing on the U.S. stock exchange.

After going public, Bunge grew rapidly. It acquired LaPlate Cereal in 2001 to become the leading agribusiness company in Argentina. In 2002, the company acquired Cereol to become the world's largest soy producer in Europe. In 2005, the company purchased its first soybean crushing and refining plant in China. This growth spurred even more in 2006 as the company opened a soybean processing plant in Spain and an oil packaging plant in Texas. It also purchased its second soybean processing plant in China. In 2007, Bunge purchased its first sugarcane mill in Brazil and acquired consumer vegetable oil brands in Romania and a food service brand in Brazil. While the financial crisis in 2008 hampered many firms, Bunge continued on its strong growth trajectory, acquiring German margarine producer Walter Rau and buying a majority stake in a second sugar and ethanol mill in Brazil. The expansion continued into 2010 as Bunge added five new sugarcane mills to its existing three in Brazil. As a result, the company now owns a large-scale sugar and bioenergy business capable of producing various sugar and ethanol products.

Bunge's growth during the past 14 years or so has coincided with its decision to go public on the New York Stock Exchange and tap the global financial market in order to support its growth strategy. This was not a coincidence. It was part of a deliberate strategy.

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When Bunge went public in 2001, its revenue was about \$11.5 billion and the book value of its equity was approximately \$1.38 billion. At year-end 2013, Bunge's annual revenue stood at approximately \$61.35 billion and the book value of its equity was approximately \$10.09 billion. This growth resulted both from the value-enhancing growth strategy adopted by Bunge's management and the lower cost of financing owing to the company's decision to access the global financial market. As a result of this growth, Bunge has created thousands of jobs throughout the world and has made significant contributions to the global agribusiness value chain, thereby helping to feed the world.

Financial System Architecture

While global financial markets help companies tap liquid pools of capital to grow, these markets are just one component of a global financial ecosystem. The global financial system includes financial institutions as well as markets. A long-standing question in economics has to do with the architecture of the financial system; that is, the relative roles

THE QUESTION IS, WHICH ARCHITECTURE IS BETTER FOR ECONOMIC GROWTH—A MARKET-DOMINATED ARCHITECTURE OR A BANK-DOMINATED ARCHITECTURE?



played by banks and markets in the allocation of capital to individuals and firms.¹⁶ The question is, which architecture is better for economic growth—a market-dominated architecture or a bank-dominated architecture? In a market-dominated financial architecture—such as the one in the United States—the economy relies more on the stock and bond markets than on banks to allocate capital, whereas in a bank-dominated financial architecture—such as the one in continental Europe—banks are more

16. One of the earliest theoretical analyses of financial system architecture appears in Boot and Thakor (1997a).



important than financial markets in allocating credit to individuals and businesses.

It is by now well accepted that better-functioning financial systems—those that are more open and competitive—improve resource allocation, regardless of whether the financial system is bank-dominated or market-dominated. Moreover, it has also been found that external finance has a greater effect on different industries in more financially developed countries.¹⁷ Research suggests that both financial intermediaries and markets affect economic growth and that reverse causality alone—meaning there is a greater demand for the financial system in more well-developed economies—is not driving this finding.¹⁸ The mechanism driving this result appears to be that better-developed financial systems ease firms’ financing constraints, making it easier and less expensive to raise capital. Thus, at one level, if we are mainly interested in how the overall financial system affects economic growth, then it matters little whether the development of the financial system comes from better-developed banks or better-developed markets.

However, specific aspects of development may be affected in different ways by whether a financial system is market-dominated or bank-dominated. For example, we may wish to know whether financial innovation is likely to be greater in a particular system, or if technological innovation is more likely in one system than the other.

IT IS BY NOW WELL ACCEPTED THAT BETTER-FUNCTIONING FINANCIAL SYSTEMS—THOSE THAT ARE MORE OPEN AND COMPETITIVE—IMPROVE RESOURCE ALLOCATION, REGARDLESS OF WHETHER THE FINANCIAL SYSTEM IS BANK-DOMINATED OR MARKET-DOMINATED.



17. See Levine and Zervos (1998).

18. See Levine (2005).

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A theoretical contribution showed that market-dominated financial systems—in which commercial and investment banks are functionally separated—tend to produce more financial innovation than bank-based financial systems.¹⁹ One can see this in the financial innovations that have occurred in the United States compared with Europe. Financial institutions and other financial market participants in the United States have produced a staggering array of financial innovations that have helped individuals and

institutions better manage risk, avail of lower capital costs, make investments they would otherwise not have made, and grow. Examples are options, futures and swap contracts, securitization, mutual funds, and ETFs, just to name a few. All these are attributable to the United States but are now used globally in large volumes—a testimony to the value they provide to the global economy.

Similarly, a recent empirical study examined whether a country's type of financial system—bank-dominated or market-dominated—affects the rate of technological change in the country, with a positive impact on long-run economic growth.²⁰ The dependent variable in this study is technological change and the key independent variable is the country's financial architecture.²¹ Other independent variables include the percentage of banking accounted by foreign banks and

THE STUDY'S MAIN FINDING IS THAT A MORE MARKET-ORIENTED FINANCIAL SYSTEM LEADS TO HIGHER TECHNOLOGICAL PROGRESS. MOREOVER, TECHNOLOGICAL PROGRESS IS ALSO POSITIVELY INFLUENCED BY A HIGHER PRESENCE OF FOREIGN BANKS, A MORE COMPETITIVE BANKING SYSTEM, A STRONGER PROPENSITY ON THE PART OF COMPANIES TO GO PUBLIC, AND LOWER STOCK MARKET VOLATILITY.



19. See Boot and Thakor (1997b).

20. The discussion below is based on Giordano and Guagliano (2014).

21. Financial architecture is measured by how total stock market capitalization relative to GDP compares with bank credit relative to GDP, measures of market efficiency (total value of shares traded divided by average market capitalization), and so on.



measures of banking concentration such as the percentage of banking assets in the hands of the top three banks. The study's main finding is that a more market-oriented financial system leads to higher technological progress. Moreover, technological progress is also positively influenced by a higher presence of foreign banks, a more competitive banking system (one that exhibits lower concentration among a few large banks and has a lower lending-deposit interest rate spread), a stronger propensity on the part of companies to go public, and lower stock market volatility.

These findings point to the importance of not only a well-developed financial system, but also one in which capital markets (both stock and bond markets, as well as markets for options, futures, and other derivatives) flourish. This means having the appropriate amount of capital market regulation, but not so much that it inhibits growth, stifles innovation, and creates such excessive costs of regulatory compliance that companies prefer to go to other regulatory jurisdictions.²² Another point to keep in mind is that one cannot conclude from studies like the one discussed above that capital markets should be developed at the expense of robust and well-functioning banking systems. An analysis of the Romanian financial system shows that if attention in reforming a former centrally planned economy is focused primarily on launching a stock market when the banking system is still primitive, then the economy does not reap the benefits of market development that is found in economies with strong banking systems.²³ The reason is that banks play important roles in a market's function. One of these roles is lending to informationally opaque borrowers and

THUS, IF THE FINANCIAL SYSTEM
LACKS A GOOD BANKING SYSTEM, IT
IS DIFFICULT FOR THE STOCK AND
BOND MARKETS TO
FUNCTION EFFICIENTLY.



22. See Thakor (2011) for a discussion of this issue.

23. See Myendorff and Thakor (2002).

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allowing them the opportunity to develop as creditworthy firms before going public. Other roles are providing loan commitments to public firms, expanding their access to liquidity, and providing lines of credit to back up commercial paper issues in the capital market.²⁴ Thus, if the financial system lacks a good banking system, it is difficult for the stock and bond markets to function efficiently.

Trade Credit

Trade credit typically involves the extension of credit by a firm to its customers. The most common form of trade credit occurs when a firm extends credit to its customers by selling goods or services and allowing the customer to pay at some date after the receipt of the goods or service. In accounting terms, the seller records the transaction as a sale and then the amount yet to be received from the customer as an accounts receivable, an asset item on the seller's balance sheet. If the customer remits payment to the seller within a contractually predetermined time (say 30 days), then the credit does not receive a financing charge. However, if the customer takes longer to pay, a financing charge is assessed. So, in effect, the firm acts as a short-term financier to its customers. Similarly, when the firm receives input from its suppliers to make the product or service it sells, it promises to pay its suppliers within a predetermined time after receiving the goods or service. Thus, the firm's suppliers effectively become its short-term financiers.

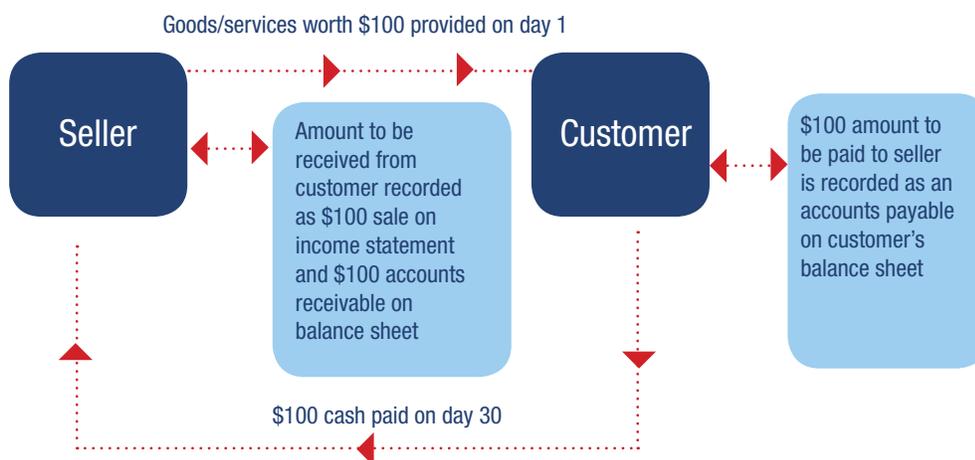
Dell Computers created a whole business model based on this premise. When you place an order for a Dell computer online and provide your credit card information, the company gets paid within 24 hours. In most cases, the laptop that is ordered is essentially put together by the components provided by Dell's suppliers, who get paid by Dell 30 days

24. See Boot, Greenbaum, and Thakor (1993) and Shockley and Thakor (1997) for analyses of loan commitments and how they help firms to finance and grow.



later. Thus, Dell's suppliers become its de facto short-term financiers and Dell will record the payment it owes its suppliers as an accounts payable on its balance sheet. *Figure 6* shows how trade credit works.

Figure 6. Trade Credit



As the above discussion explains, trade credit is a partial substitute for a bank loan. If the seller were not to give the customer time to pay for the purchased goods or service, the customer would have to borrow that amount from a bank. What then is the relationship between the characteristics of a country's banking system and the extent of trade credit? Considerable research has been done on this issue. Using firm-level data for 39 countries, a study computed payables and receivables turnovers and examined how they differed across financial systems.²⁵ The study documented that the development of a country's banking system and legal infrastructure predicts the use of trade credit. Firms' use of bank debt relative to trade credit is higher in countries with more efficient legal systems. The reason is that when the legal system is less efficient, the rights of creditors are less protected and less strong, which then induces banks to possibly curtail the supply of credit

25. See Demirgüç-Kunt and Maksimovic (2001).

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or charge more for it. Because a seller has ways outside the formal credit-rights-protection regime with which to “punish” the borrower for not paying—by refusing to sell products or services in the future, for example—trade credit is less sensitive to the strength of creditor rights than is bank credit. Therefore, in countries in which the legal system is less efficient, trade credit substitutes for bank loans to a greater extent and is more important.

The study also finds that firms in countries with larger and privately owned banking systems offer more financing (trade credit) to their customers, and also take more financing (higher payables) from them. That is, the aggregate amount of trade credit relative to bank loans is higher in these countries. Therefore the provision of trade credit complements the role played by banks and other financial intermediaries.

The importance of trade credit in promoting higher global trade flows cannot be overstated. A recent study examined how important trade credit is for global trade.²⁶ At first glance, it becomes apparent that these are large flows. Using a database that covers almost 100 countries and the 2005–11 time period, the study notes that the total amount of trade credit recorded annually is close to \$1 trillion, and annual global trade flows during this period are about \$18 trillion. The study notes that, in practice, it is difficult to establish a causal effect of trade credit on trade because of *reverse causality* concerns—the volume of trade demand affects the demand for trade credit, and trade credit availability affects trade. To overcome this problem, the study uses a careful two-stage econometric approach. In the first stage, the study finds that the volume of available insured trade credit is strongly correlated with economic and financial conditions over a full economic cycle. Trade credit is significantly determined by the level of liquidity in the economy and by GDP as a measure of national income. Then in the second stage, the study finds that trade credit is a strong determinant of trade.

Thus, three broad conclusions emerge. First, when we think about the global

26. The following discussion is based on Auboin and Engemann (2013).



financial system as consisting of a variety of financial institutions, financial instruments, and markets, we should also consider trade credit as an important component of the system. In fact, although trade credit is a partial substitute for bank credit, it is positively affected by the development of the global financial system. The ability of the seller to avail of low-cost financing options in the interconnected global financial system enables the seller to offer trade credit at favorable terms to its customers. Second, the availability of trade credit has a positive effect on global trade. In other words, trade credit is good for Main Street—it facilitates imports of goods and services which benefits all market participants. Finally, trade credit represents another way in which the global financial system becomes more interconnected, in the sense that it links firms and their customers—and hence their banks as well, since these banks provide letters of credit and stand-by letters of credit to facilitate trade—across national boundaries.²⁷

TRADE CREDIT IS GOOD FOR MAIN STREET—IT FACILITATES IMPORTS OF GOODS AND SERVICES WHICH BENEFITS ALL MARKET PARTICIPANTS.



Project Finance

Project financing is a technique for financing large-scale infrastructure projects, including those in natural-resource sectors of the economy, such as energy and mining.²⁸ It has become quite popular as a way for financing projects (sometimes with government assistance) that may otherwise be considered too large or risky for companies to invest in. The typical approach in project financing is to incorporate the project separately as an

27. See Greenbaum, Thakor, and Boot (forthcoming) for a discussion of letters of credit and stand-by letters of credit.

28. This discussion is based in part on Greenbaum, Thakor, and Boot (forthcoming).

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independent entity so that those who provide financing get a claim only on the cash flows of the project. The firm that sponsors the project invests some equity, and may involve as equity sponsors others like investment banks. In addition to the equity provided by the project sponsors, a substantial fraction of the financing is provided by debt that is typically *nonrecourse* to the sponsors. Nonrecourse debt means that the lenders have a claim only against the cash flows of the project and not against any other cash flows of the sponsor.

Project financing is used for many reasons. First, because the cash flows of the project are not commingled with those of the sponsor, asymmetric information is less of a problem for the lender than would otherwise be the case. This lowers the lender's information processing costs and results in a lower cost of capital for the sponsors. Second, the absence of cash flow commingling also means that moral hazard—the propensity of the sponsoring firms to increase the risk to which project lenders are exposed by activities in other parts of the business that are difficult for the lenders to monitor—is minimized. This has two effects: it reduces the cost of capital for the project and also allows a higher amount of debt to be used, which generates bigger tax savings. Finally, because the debt is nonrecourse to the sponsors, the project leaders have to claim against the other assets of the sponsors, so sponsors do not expose themselves to the risk of financial distress in the event the project experiences difficulties. This is especially important for large projects.

Project financing was used during the 1970s in the development of North Sea oilfields and also in the U.S. power market in the late 1970s and 1980s.²⁹ Perhaps the most prolific use of project financing has been in the United Kingdom, where something called the “Private Finance Initiative” (PFI) has been used. PFI was started in 1992 and has been managed by the British government as a systematic public-private partnership program. The way it works is as follows. The government forms a partnership with a private sponsor

29. The discussion here is based in part on Gardner and Wright (2014).



to build some infrastructure—street lighting, schools, roads, and so on. In exchange, the sponsor receives a long-term *concession*, which is essentially a defined revenue stream over the life of the contract that provides returns to the sponsors’ investors. This arrangement has many benefits for project sponsors as well as taxpayers, which is why project financing has grown. *Figures 7a* and *7b* provide data on project financing transactions by region and by country, and *Figure 9* provides data by sector. It is apparent that power and transportation projects dominate the project financing market.

Figure 7A. Project Finance Transactions by Region

	2010		2007	
	US\$m	%	US\$m	%
Asia Pacific	98,708.30	47.42%	44,842.30	20.38%
EMEA	83,931.20	40.32%	130,667.30	59.40%
Americas	25,534.50	12.27%	44,476.30	20.22%
Global Total	208,173.90	100.00%	219,985.90	100.00%

Source: Thomson Reuters Project Finance International.

Figure 7B. Project Finance Transactions by Country (2010)

Country	US\$m	%
India	54,801.70	26.32%
Spain	17,376.10	8.35%
Australia	14,592.10	7.01%
United States	13,423.80	6.45%
United Kingdom	13,020.80	6.25%
Taiwan	12,064.40	5.80%
Saudi Arabia	10,000.20	4.80%
Switzerland	5,371.20	2.58%
France	5,350.70	2.57%
Italy	5,014.50	2.41%
Top 10 Total	151,015.50	72.54%
Global Total	208,173.90	100.00%

Source: Thomson Reuters Project Finance International; and Gardner and Wright (2014).

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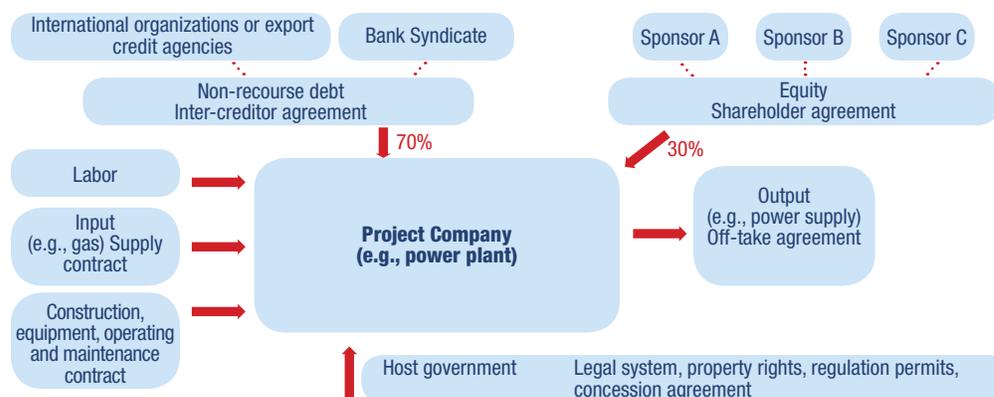
Figure 8. Project Finance Transactions by Sector (2010)

Sector	US\$m	%
Power	73,300.40	35.21%
Transportation	52,315.40	25.13%
Oil & Gas	25,950.80	12.47%
Leisure & Property	13,824.20	6.64%
Telecommunications	13,382.70	6.43%
Petrochemicals	11,306.40	5.43%
Mining	8,857.70	4.25%
Industry	6,306.00	3.03%
Water & Sewerage	1,577.50	0.76%
Waste & Recycling	1,266.60	0.61%
Agriculture & Forestry	86.30	0.04%
Global Total	208,173.90	100.00%

Source: Thomson Reuters Project Finance International.

A typical project financing structure involves multiple contracting relationships as shown in Figure 9. Hybrid structures that combine features of conventional financing and project financing are also being developed. With these structures, the debt financing provided to the project is still nonrecourse to the sponsor, but lenders diversify some risk away by financing portfolios of projects rather than single projects. Moreover, in some project financing ventures with private-public partnerships, private financiers assume construction and operating risks and host governments take on market risks.

Figure 10. Typical Project Finance Structure





THE GLOBAL FINANCIAL LANDSCAPE: REGULATION OF MARKETS AND BANKS AND THEIR INTERCONNECTEDNESS

The global financial system has many regulators who watch over and formulate rules of conduct for the players who transact with each other in that system. An important goal of these regulators is to enhance financial stability. The nature of regulation depends in part on the architecture of the financial system discussed earlier. This section briefly discusses how financial markets and banks are regulated, and how the desire for global financial stability creates interconnectedness in the actions of regulators.

Financial Markets: The Regulators

The regulatory bodies involved in global financial markets are far too numerous to enumerate here, so the focus will be rather selective. Specifically, this report will discuss broadly the role of regulators in financial markets and the major goals of regulation, especially on an increasingly interconnected financial system. In the context of this discussion, some of the major regulators and the roles that they play will be discussed.

Consider first *financial market regulation*. For simplicity, this section focuses on the stock market, but it is easy to extrapolate the main ideas to other financial markets as well. The Securities and Exchange Commission (SEC) states its mission on its website as “to protect investors, maintain fair, orderly, and efficient markets, and facilitate capital formation.” When one thinks about this mission carefully, one sees a tension in the

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regulatory goals of the SEC, which regulates U.S. capital markets. On the one hand, the SEC seeks to protect investors. This means the SEC must insist on a stringent set of information disclosure requirements to ensure that investors do not end up buying lemons when they purchase stocks traded on U.S. exchanges. This assurance creates confidence in the stock market and encourages broader investor participation in the market. Whenever firms from other countries come to list on U.S. exchanges, they find that the information disclosure requirements far exceed what they have been accustomed to. The requirements create greater transparency and a more liquid capital market in which there is greater investor participation. But on the other hand, firms are also reluctant to disclose too much information because any information that they disclose to investors is also (inadvertently) disclosed to their product-market competitors.³⁰ Thus, if information disclosure requirements become too stringent, firms may be chased away to other regulatory jurisdictions, which would interfere with the SEC's second goal, namely facilitating capital formation. Thus, an appropriate balance must be maintained.

Another aspect of investor protection that is implicit to the SEC's mission is ensuring effective *corporate governance* so that the well-known divergence of interests between managers and investors does not significantly hurt investors' interests.³¹ This means companies must have independent directors on corporate boards who look out for the interests of investors, besides providing counsel to the firm's managers. But here too a tension exists. The SEC seeks to use its own reporting requirements and other guidelines to add to the quality of the governance the firm would have in the absence of these SEC mandates. And yet, the possibility exists that the more effective the SEC becomes in

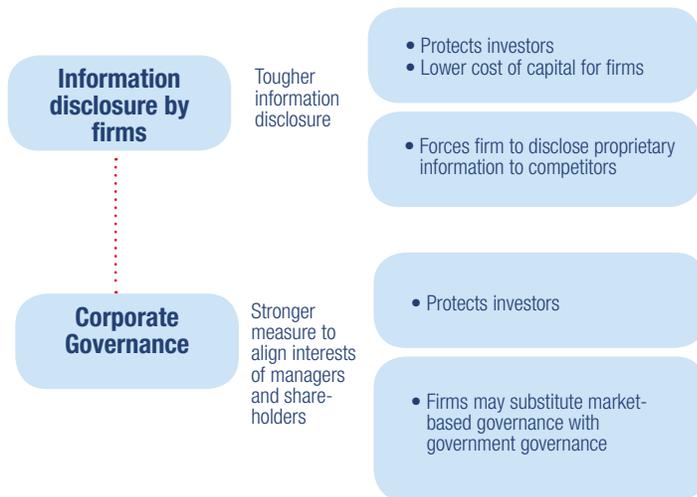
30. Bhattacharya and Ritter (1983) were the first to observe this spillover effect in their theory of optimal information disclosure. Thakor (2014) shows how greater information disclosure about strategy can create a risk of funding denial for the firm.

31. Jensen and Meckling (1976) introduced this divergence to finance and studied its implications for ownership and capital structure.



ensuring this, the more it substitutes the governance that would be provided anyway; that is, the improvement in governance provided by the SEC crowds out governance that the firm would have had anyway. A recent study documents empirically that this is what happened when the SEC was created.³² Thus, governance reform must always be cognizant of this *substitution effect*, whereby government-sponsored (SEC) governance effectively ends up substituting for market-based governance. A key implication is that the SEC's governance efforts should be focused in areas in which market-based governance is weak or fails altogether. *Figure 10* depicts these tensions in the regulation of securities markets.

Figure 11. Tensions in the Regulation of Securities Markets



Bank Regulators

Let us now turn to bank regulation. Banks are institutions that are typically regulated by the central banks in the countries in which they are headquartered and operate. In the United States, the Federal Reserve System (Fed) regulates banks; in Europe, the European Central Bank (in addition to national regulators) fills this role. The U.S.

32. See Avedian, Cronqvist, and Weidenmier (2014).

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Federal Reserve System states its duties as falling into four categories:

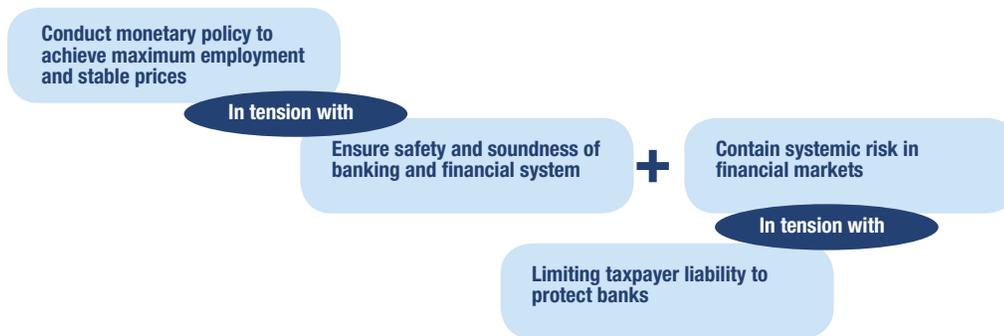
- Conducting the nation's monetary policy by influencing the monetary and credit conditions in the economy in pursuit of maximum employment, stable prices, and moderate long-term interest rates;
- Supervising and regulating banking institutions to ensure the safety and soundness of the nation's banking and financial system and to protect the credit rights on consumers;
- Maintaining the stability of the financial system and containing systemic risk that may arise in financial markets; and
- Providing financial services to depository institutions, the U.S. government, and foreign official institutions, including playing a major role in operating the nation's payments system.

The Fed has to cope with various tensions in the conduct of its policies. For example, increasing employment might call for the Fed to encourage banks to lend more, which may call for a loose monetary policy and low interest rates. However, to expand lending, banks may have to make riskier loans, which can jeopardize the Fed's goal of containing systemic risk. This tension may also play out in the Fed pursuing its goals of microprudential regulation by increasing capital requirements for banks, but bankers may claim that this will reduce lending and limit economic growth. Similar tensions may exist when it comes to protecting the credit rights of consumers. On the one hand, the more extensive the set of consumer protection laws and the more vigorous the enforcement of these laws, the potentially greater the protection offered to consumers. But on the other hand, the costs imposed on banks for developing compliance procedures and filling out the necessary paperwork to document compliance are higher. As a central bank, the Fed always walks a fine line in navigating these competing



priorities. Yet another tension exists between the desire to prevent bank failures (the stability objective) and the desire to limit the exposure of taxpayers who must provide assistance to prevent banks from failing. These tensions are depicted in *Figure 11*.

Figure 11. Tensions in the Regulation of Banks



The mandate of the European Central Bank (ECB), the bank regulatory agency for the European Union, is similar to that of the Fed, but it is not the same. The ECB states its primary objective as follows:

“The primary objective of the European System of Central Banks ... shall be to maintain price stability. Without prejudice to the objective of price stability, the ESCB shall support the general economic policies in the Union with a view to contributing to the objectives of the Union as laid down in Article 3 of the Treaty of the European Union.”

The ECB defines its basic tasks as follows:

- The definition and implementation of monetary policy for the euro area;
- The conduct of foreign exchange operations;
- The holding and managing of the official foreign exchange reserves of the euro area countries (portfolio management); and
- The promotion of the smooth operation of payments systems.

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The differences between the Fed's mandate and the ECB's mandate are related in part to the fact that each country within the European Union also has its own central bank with supervisory and regulatory domain over the banks in the country.

The tensions and related challenges faced by central banks typically come to a head during financial crises. It is important to note that every financial crisis is preceded by some problems in the “real” (nonfinancial) sector of the economy and the crisis, in turn, also affects the real sector. That is, a financial crisis is typically generated by some problems in the real sector, but the crisis then has its own independent adverse effect on the real sector, making the initial problem worse and more persistent. Consider the manner in which the 2007–09 financial crisis played out in the euro area. It has been proposed that three interlocking crises occurred, as shown in *Figure 12*.³³ The first was an *economic recession*, which has been referred to as a “growth crisis.”³⁴ The second was a *banking crisis*, and the third was a *sovereign debt crisis*. Poor economic conditions such as a recession, cause borrowers to become delinquent on their bank loans, which then increases nonperforming loans on banks' balance sheets, causing bank equity to decline, leading to a reduction in bank lending.³⁵ In extreme cases, loan defaults can be so high that banks may fail. This may lead to bailouts by the respective sovereign governments,³⁶ which may put significant financial stress on the public finances of these countries, especially since these events are likely to coincide with lower tax revenues (because there is an economic recession). This can eventually lead to a sovereign debt crisis if this financial stress threatens the ability of the government to make payments on its debt obligations.

33. See Noeth and Sengupta (2012) and Shambaugh (2012).

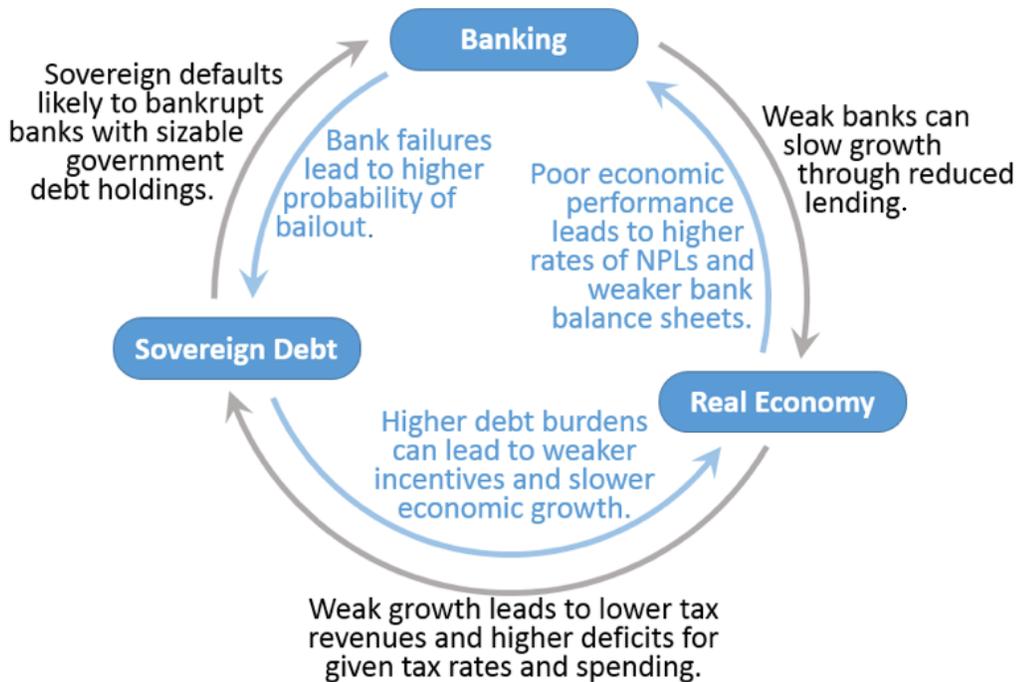
34. See Shambaugh (2012).

35. This chain of events is referred to as the “bank balance sheet channel.” See Bernanke and Gertler (1995).

36. Bailouts may occur through the government either paying off depositors under its deposit insurance scheme or recapitalizing banks or both.



Figure 12. Three Interlocking Crises in the Euro Area



Note: *NPLs are nonperforming loans.*

Source: *Shambaugh (2012).*

Regulatory Actions to Achieve Financial Stability Create Greater Interconnectedness

Event chains like the one described above often cause central banks to intervene massively in financial markets. And because economic conditions have common elements across countries, the actions of major central banks also end up being connected. Consider what has happened since the bursting of the real estate bubble in 2007 that led to the 2007–09 crisis. The major central banks of the most developed countries (ECB, the Bank of England, the U.S. Federal Reserve, the National Bank of Switzerland, and the Bank of Japan) have all loaned massive amounts of money to their banks to ensure that they do

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not fail. The aggregate amount of lending from central banks to the private financial sector since 2007 is estimated to exceed \$20 trillion.³⁷

Some of this lending has been indirectly linked to the market-based financing since it was provided to banks that were, in turn, using their resources to bail out or financially support their own *money market funds* (MMFs). An MMF is a mutual fund that collects money from individuals and, in exchange, gives them equity claim on the fund. MMFs invest the money in short-term debt securities like U.S. Treasury bills and commercial paper. MMFs are often regarded as a close substitute for bank deposits because they are liquid and have relatively low risk but provide higher yields than deposits. However, during the financial crisis, it was discovered that MMFs were really not as riskless as bank deposits, and the fact that MMFs were not insured by the federal government was of some consequence. Indeed, research has documented that MMFs had opportunities to take risk in the pursuit of higher yield during and after 2007, as the difference in yield between asset-backed commercial paper and Treasury bills rose to as high as 125 basis points, and that they indeed took advantage of these opportunities.³⁸

Many major banks sponsor MMFs. Wells Fargo, the fourth-largest bank in the United States, has an MMF that manages \$24 billion in assets, whereas Goldman Sachs, the fifth-largest bank, has one that manages \$25 billion in assets. U.S. banks also operate MMFs in Europe. JP Morgan Chase has an MMF with €18 billion in assets, Blackrock has an MMF with €11.5 billion in assets, and Goldman Sachs has one with €10 billion in assets.

In addition to direct provisions of cash to banks, central banks have other ways of assisting banks. One way is by purchasing securities from banks. For example, between 2008 and 2014, the Fed purchased mortgage-backed securities worth \$1.5 trillion. While

37. See Toussaint (2014).

38. See Kacperczyk and Schnabl (2013).



the ECB does not purchase securities in this manner, it permits member banks to use them as collateral against ECB loans to these banks, so the effect is similar. The ECB has also purchased covered bonds issued by private banks to finance their activities.

This leads to the following broad conclusions. First, the interventions of central banks to help stave off the failures of banks in their countries have many common elements. These interventions are, in fact, connected, since the central banks communicate with each other and often coordinate their actions (especially the ECB and the Fed). Second, central banks have invested massive amounts of resources in assisting their banks in order to limit systemic risk, which illustrates how the tension between the desire for financial stability and the desire to limit taxpayer support of banks has played out in practice. Third, while people often discuss the banking and shadow banking systems as if a bright red line divided them, quite a bit of shadow banking is actually embedded within traditional banks, and the conduct of central bank policy effectively provides resources to also support shadow banking institutions. Indeed, this support was quite explicit during the 2007–09 financial crisis as a run on MMFs prompted the U.S. government to intervene by providing unlimited insurance to all MMF investors, even though these investors' MMF accounts had no deposit insurance.³⁹ Finally, as research on financial system architecture has shown us, well-developed financial systems that are market-dominated (like in the United States) as opposed to bank-dominated (like in Europe) tend to be more innovative in creating new financial products to help to better manage risk and also more effectively support technological innovations in the real sector. Thus, while it is important to first develop robust and healthy banking systems, once the system is in place, then the more the architecture of the financial system leans on markets, the stronger and more vibrant the financial system becomes.

39. See Kacperczyk and Schnabl (2013).

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HOW INTERNATIONAL BANK REGULATION WORKS

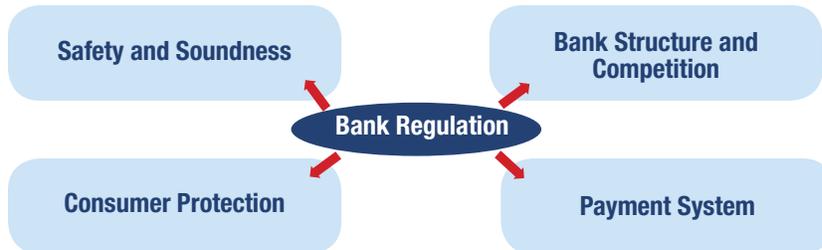
Both banks and markets are regulated in every country in the world. Before discussing how international regulation works—this section will focus on bank regulation—it is useful to consider why banks are regulated and the main areas in which they are regulated. This is the first topic addressed in this section. Then I turn to why we need international banking regulation. This is followed by a discussion of the specifics of European and U.S. bank regulation, and the main differences between the regulatory approaches, including those that can be attributed to the different financial system architectures in the two continents. I then briefly discuss the cumulative effect of bank regulation. The section concludes with a discussion of how excessive and poorly coordinated regulation can hurt economic growth.

Why Are Banks Regulated and What Is Regulated?

Banks are regulated for a variety of reasons, not the least of which is that because banks provide credit as well as payment services to the economy, the continued survival of banks is an important goal of most governments. Therefore, widespread bank failures are considered unacceptable, and governments provide deposit insurance as well as a host of other guarantees to protect banks. These guarantees, in turn, require regulations to ensure that banks' behavior does not increase the exposure of taxpayers who fund the safety net for banks, which then engenders a host of regulations.⁴⁰ *Figure 13* shows the different areas in which banks are regulated.



Figure 13. Bank Regulation



Safety and Soundness: Banks are widely regarded as being more fragile than nonfinancial firms and thus more failure-prone. This is attributable to two main factors. First, a large fraction of a bank’s financing comes from demand deposits, which can be withdrawn at a moment’s notice; because we have *fractional reserve banking*,⁴¹ the bank can fail even when its loans are in good standing. Second, banking failures are contagious because banks hold very similar assets, so the failure of one bank conveys adverse information about the asset portfolios of other banks.

For this reason, banks are subject to *prudential regulation*, which consists of regulatory requirements on capital, liquidity, and recovery and resolution planning. Banks are also subjected to stress tests by their central banks to determine how well they would stand up to adverse events. A key component of prudential regulation is a requirement stipulating how much equity capital a bank should keep as a percentage of its assets.

Bank Structure and Competition: Bank regulators seek to ensure that banking remains a reasonably competitive business, and excessive concentration is avoided. The contemporary theory of financial intermediation indicates that banks are natural monopolies, so natural economic forces push banks to become larger.⁴²

41. *Fractional reserve banking* means that at any point in time only a fraction of the bank’s total deposits are kept in the bank as cash, so if all depositors wish to withdraw at one time, the banks would not have enough cash to satisfy all withdrawals.

42. See, for example, Ramakrishnan and Thakor (1984).

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Regulators are concerned about banking concentration and bank size for at least three reasons. First, if the banking system is controlled by a few large banks, then noncompetitive pricing could occur and the bank customers could be worse off. Second, the larger the bank, the more costly is that bank's failure to society, so regulators identify banks that are "too big to fail" and make sure that public funds are used to protect these banks even beyond the de jure protection provided by deposit insurance. But if a bank gets too large, it may be "too big to save" because to save it may require funds that exceed the capacity of the country. For example, prior to the 2007–09 financial crisis, the five largest banks in Iceland collectively had assets that were five times the annual GDP of Iceland. Similarly, at one time, Barclays's total assets exceeded the GDP of the United Kingdom, where the bank is headquartered. To avoid such large exposures, regulators may wish to keep banks from becoming too large. Third, larger banks tend to be more complex, and more complex banks tend to exhibit greater interconnectedness with a variety of counterparties and with other banks. This makes it more challenging to regulate them. A key factor in the United States government's decision to come to the assistance of Bear Stearns was that it was in the center of a large and complex web of swap transactions.

In the future, regulatory requirements are likely to force radical structural changes, including possibly splitting up global entities into smaller, separately regulated subsidiaries.

Consumer Protection: Regulators fear that consumers' lack of financial sophistication may lead them to make poor choices when purchasing financial products and services. That is, regulators worry about a financial sophistication asymmetry that exists between banks and their customers. This asymmetry leads to regulators asking banks to more clearly, and in greater detail, provide information to consumers to enable them to make smarter choices. Such regulations are also intended to protect against fraud and



misrepresentation. Additional regulations are designed to ensure equal access to credit for consumers regardless of characteristics like race, color, gender, or country of origin.

Payments System: In many countries, banks operate much of the retail and wholesale payments system through clearing the settlement of checks, credit and debit cards, and large-denomination electronic interbank transfers.⁴³ An efficient payments system is a key component of an advanced financial system because it enables smooth global flow of funds. However, once an efficient payments system is established, it is difficult to see an economic rationale for a lot of government intervention, beyond the central bank playing a lender-of-last-resort role to provide emergency liquidity to the banking system.

Why Do We Need International Banking Regulation?

The stresses experienced by banking systems in various countries in the 1980s made regulators realize that the interconnectedness of banks spanned national boundaries, so the traditional method of operating with independent national regulations was outdated. International harmonization of bank regulation was needed. This harmonization had another purpose: to increase the safety of the global financial system by reducing the likelihood of individual failures that could spread across national boundaries and become a global contagion. This safety was to be achieved by stipulating, for the first time, minimum risk-adjusted capital ratios that regulators in different countries had to adopt to ensure that the banks in their countries were sufficiently well capitalized. Each national regulator could choose to impose higher capital requirements, but not lower.

The design of the transnational regulations was delegated to a newly established Basel Committee on Banking Supervision, located in the Bank for International

43. See, for example, Hall and Kaufman (2002).

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Settlements (BIS) in Basel, Switzerland, and it was comprised of representatives from central banks and banking regulators in developed countries.⁴⁴ The first capital accord (called Basel I) was completed in 1988 and was implemented by member countries by year-end 1992. The key was that bank assets were grouped in different categories based on (primarily credit) risk, and riskier assets had to be supported with more bank capital. Since then, refinements of Basel I, called Basel II and Basel III, have been formulated.

Specifics of American and European Bank Regulation

While many uncertainties still exist about the liquidity and leverage (or capital requirements) ratios that banks will be subject to as well as how risk-weighted assets will be implemented under Basel III, the direction of changes for both the liquidity and leverage ratios is to increase safety and soundness in banking. The Basel Committee has signed off on a revised approach to the liquidity coverage ratio, which is defined as the minimum amount of high-quality liquid assets the bank should hold to cover stressed cash outflows over a 30-day period. The leverage ratio is defined as the percentage of a bank's total adjusted assets accounted for by equity capital.⁴⁵ Regulators in many countries (including the United States) use the leverage ratio along with a ratio of capital to risk-adjusted assets⁴⁶ in their prudential regulation of banks.

Under Basel III, the minimum leverage ratio is 3%. While the ECB has continued to use this ratio, U.S. banks have been subjected to additional capital requirements based on stress tests of individual banks. This is one reason why there continue to be noticeable

44. See Greenbaum, Thakor, and Boot (forthcoming) for a discussion of the Basel capital accords.

45. Defined as capital plus reserves minus some intangible assets like goodwill software expenses and deferred taxes. Total adjusted assets are total assets minus intangibles.

46. Assets are risk-adjusted by assigning risk weights to different assets, with higher weights being assigned to riskier assets.



differences between the leverage ratios of European and U.S. banks, the other reason being different accounting standards. It has been suggested that bank regulators in both Europe and the United States have allowed banks to increase the fraction of debt in their capital structures—thereby reducing their leverage ratios—but the incentives were stronger in Europe because of “the permissive bank risk management practices epitomized in the Basel II proposals.”⁴⁷ Because European regulators permitted banks to operate with lower amounts of capital, these banks expanded their balance sheets more rapidly than U.S. banks. European banks exhibited a preference for assets with low-risk weights, so they were able to report strong capital ratios under the Basel II framework.⁴⁸ Using this approach, the top global European banks like BNP Paribas, Barclays, Deutsche Bank, and Société Générale all expanded their lending at an unprecedented rate from 1997 to 2008. By contrast, U.S. banks have been governed more by the Basel I capital guidelines, which resulted in higher capital ratios, and they tended to focus more on assets that had attractive expected returns.⁴⁹

Another key difference between Europe and the United States lies in their financial architectures. As noted previously, the architecture of the European financial system is bank-dominated, whereas the architecture of the U.S. financial system is market-dominated. This means European firms are much more dependent on bank finance than U.S. firms. In the United States, asset managers are moving into the spaces vacated by banks, which is not the case in Europe, where undercapitalized banks with bloated

ANOTHER KEY DIFFERENCE
BETWEEN EUROPE AND THE
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FINANCIAL ARCHITECTURES.



47. See Shin (2012).

48. See Avramova and Le Leslé (2012).

49. See Noeth and Sengupta (2012).

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CREATING A DEEP AND INTEGRATED EUROPEAN CAPITAL MARKET WITH THE DIVERSITY OF THE U.S. FINANCIAL MARKET WILL GO A LONG WAY IN HELPING THE EUROPEAN FINANCIAL SYSTEM TO BECOME MORE RESILIENT AND VIBRANT.



balance sheets many times larger than the European Union economy rely on assistance from the ECB and subsidies from national governments, and hold on to their share of the market. This impedes the allocation of capital to the best projects and hurts GDP growth, lengthening Europe's economic malaise. If Europe had a financial architecture more like that of the United States, European firms could shift to market finance to replace lost bank funding. Creating a deep and integrated European capital market with the diversity of the U.S. financial market⁵⁰ will go a long way in

helping the European financial system to become more resilient and vibrant.

The Cumulative Impact of Bank Regulation on the Economy

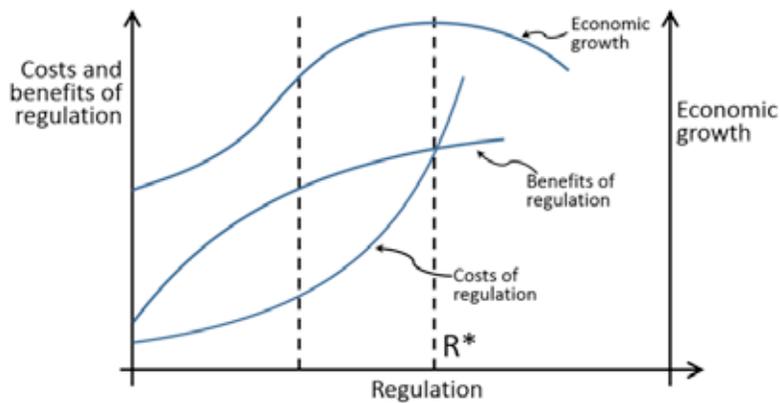
While a certain amount of bank regulation is necessary to maintain a safe and sound financial system that promotes economic growth, excessive regulation can impose costs that exceed the benefits of the regulation. The history of bank regulation is that it is usually enacted in response to a crisis, and then there is often an overreaction as the new regulation reaches too far and becomes excessively stringent. Since the 2007–09 crisis, a steady stream of new regulations have been enacted, and banks are seeking to reduce the added costs of the cumulative impact of regulatory reforms on the costs of funding, compliance, reporting, risk management, and governance.

The relationship between regulation and economic growth is nonmonotonic, as



shown in *Figure 14*.⁵¹ Up to a point, call it R^* , regulation is good for economic growth. Up to this point, the benefits of regulation exceed the costs. Beyond R^* , the costs exceed the benefits and further regulation hurts economic growth.

Figure 14. The Relationship between Regulation and Economic Growth



How Excessive and Poorly Coordinated International Regulation Can Hurt Global Economic Growth

Owing to the shock waves produced by the global financial crisis of 2007–09, regulators the world over have become tougher in their regulation of banks and markets. However, as is typically the case, regulatory reforms adopted after a crisis tend to go too far. The 2007–09 crisis is no exception. Banks have been contracting their balance sheets, and this shrinkage has reduced the financing banks provide for their customers as well as their willingness to warehouse risks. Since this retrenchment has occurred in various types of relationship lending, market-based financing has not entirely filled the void created by the departure of traditional banks. Banks have also reduced their market-making

51. KPMG Financial Services (2014).

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activities in the securities market.⁵² This has resulted in two consequences that are both inimical to economic growth: market volatility has increased, and thinly traded contracts are threatened with a potential shortage of liquidity. A sort of competitive tension has been created as European and U.S. regulators demonstrate their regulatory effectiveness in promoting financial stability. Thus, although much of the regulation coming out of Washington, D.C., and Brussels (European Union) is conceptually similar, conflicts do exist. For example, a regulatory push is under way to conduct more derivatives trading through clearinghouses. A large fraction of swaps activity is on a trans-Atlantic basis, and it would need to be done through a clearinghouse that is approved by European regulators. But it is unclear if any U.S. clearinghouses would qualify, which creates uncertainty. Another issue is the regulatory focus on geographically aligning the origin and management of risk; for example, requiring global banks to create Asian subsidiaries (incorporated in Asia) to house risks originated in Asia. This focus tends to create a Balkanization of global financial markets, with inefficiencies in institutional balance sheet management and higher costs of capital for financial institutions thereby reducing participation by banks in many markets.

The silver lining is that now the regulatory focus in both Europe and the United States is shifting from concerns about safety to a more balanced focus on safety as well as economic growth. This shift is especially important in Europe, where bank-based financing is still more important than market-based financing.

52. In the United States, this reduction is partly attributable to the adoption of the Volcker Rule. However, this rule is now also effectively being adopted by European regulators.



THE PROVISION OF MARKET-BASED FINANCE

Market-based financing has grown rapidly in the past decade. The term *shadow banking* somehow conjures images of illicit banking or banking in the “gray” economy. It is nothing of the sort. Indeed, market-based financing is very much a part of the mainstream financial system. “Shadow banking” is a term that was coined by economist Paul McCully in a talk at a conference in Jackson Hole, Wyoming, hosted by the Federal Reserve Bank of Kansas City in 2007. It refers to institutions that act like banks in the sense that they engage in *maturity transformation*—investing in assets with maturities longer than those of the liabilities that fund them—but they are not supervised like banks. While “shadow banks” do not finance themselves with short-maturity deposits like commercial banks do, they nonetheless raise short-term debt in the financial market through repurchase agreements or “repos.”⁵³ Thus, broker-dealers who fund their assets using repos are “shadow banks”. Similarly, money market mutual funds that pool investors’ funds to purchase commercial paper or mortgage-backed securities, finance companies that sell commercial paper and extend credit to households and individuals are part of, the market-based financing system.⁵⁴ Insurance companies, hedge funds, and investment banks are also part of market-based financing.

53. As pointed out in Section II, a repo is an arrangement whereby an institution borrows short term from another institution, using marketable securities (Treasuries, mortgage-backed securities, etc.) as collateral. When the loan is repaid, the collateral is returned. Technically, the security is sold to the lender (so the price paid by the lender becomes the loan) and the loan repayment is considered a repurchase of the security by the borrower.

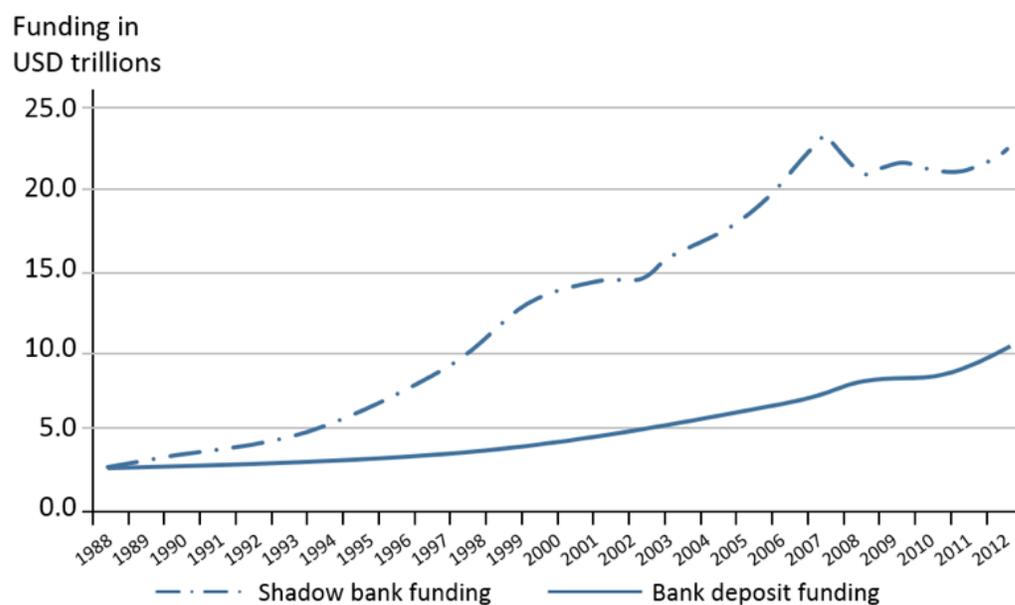
54. For discussions of shadow banking, see Kodres (2013) and Greenbaum, Thakor, and Boot (forthcoming).

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Funding in the market-based financing sector has grown much faster than bank deposit funding, as shown in *Figure 15*.

Figure 15. Shadow Bank Funding and Traditional Bank Deposit Funding from 1988 to 2012



Market-based financing is therefore a much bigger sector of the U.S. financial system than traditional depository banking. The fact that not only was such a large sector not regulated like banks, but that there were no data on what was happening in this sector may have had something to do with the fact that regulators were caught off guard by the developments that triggered the financial crisis in the United States.⁵⁵

Prior to the 2007–09 financial crisis, shadow banking entities were characterized by inadequate information disclosure about the values of their assets, opaque governance and ownership structures between banks and shadow banks, lack of regulatory oversight



associated with traditional banks, little capital to absorb losses, and low cash levels to meet redemptions.⁵⁶ In May 2010, the Federal Reserve began collecting and publishing data on the part of the shadow banking system that deals with repo lending.

In 2012, the Financial Stability Board conducted a global monitoring exercise to gather data that show that the U.S. market-based financing system is still the largest in the world, although its share globally has declined from 44% to 35%. The global market-based financing system rose to \$62 trillion in 2007, declined during the crisis to \$59 trillion, and then grew again to \$67 trillion by year-end 2011, making its share of total financial intermediation about 25% in 2009–11.

While market-based financing performs some financial intermediation roles that may have been vacated by traditional banks, it is important to recognize that commercial banks get involved in market-based financing in various ways.⁵⁷ Perhaps the most obvious way is that commercial banks are owned by bank holding companies (BHCs). A BHC might own a wealth management unit with a money market mutual fund. Another example is that a commercial bank originates loans whose securitization creates securities that market-based financing institutions holds and then borrow against to use as collateral in repo transactions.

56. See Kodres (2013).

57. This discussion is based, in part, on Greenbaum, Thakor, and Boot (forthcoming).

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CONCLUSION

The global financial system is vast and global flows within this system have an enormous effect on the real economies of different countries; that is, on GDP, economic growth, and the well-being of individuals.

- The global financial system is vast and consists of financial institutions (banks and shadow banks) as well as financial markets in stocks, bonds, commodities, and derivatives.
- The global financial system promotes economic growth by performing key functions that facilitate and enhance the flow of capital from savers to investors, and increase the set of opportunities to individuals and businesses.
- The global financial system is highly interconnected. This interconnectedness increases the complexity of international regulation harmonization, while simultaneously increasing the need for it. If regulation is not harmonized across national boundaries, regulatory arbitrage may occur as banks from more tightly regulated domains seek to escape to those with more lax regulation. This may then lead to an increase in financial risk in the domain with lax regulation, but global interconnectedness may cause this risk to spill over elsewhere, increasing global systemic risk. Thus, regulators must be cognizant of the fact that any change in regulation in one part of the global financial system is likely to have global ripple effects.
- Firms tap the global financial markets to raise capital and the depth and liquidity of the global financial market help companies reduce their cost of capital and improve access to funds, thereby facilitating investments and



growth. Thus, better-developed global financial markets spur entrepreneurship, investment, employment growth, and continued rise in GDP.

- The global financial system promotes global trade through financing mechanisms outside the banking system, through trade credit, which is credit extended by firms to their customers. Trade credit is large in magnitude and increases with the size of global trade flows. Moreover, the magnitude of trade credit is positively affected by the development of the global financial system.
- Project financing has been creatively used to finance large-scale projects. It has often involved private-public partnerships in which governments are able to get private companies to build public infrastructure.
- Financial architecture refers to the composition of a financial system, namely the relative importance of banks and markets in allocating capital. Roughly speaking, financial systems fall into two broad categories—bank-dominated and market-dominated. Market-dominated financial systems seem to be associated with a higher rate of technological change, but regardless of whether a financial system is bank-dominated or market-dominated, development of the financial system promotes economic growth.
- Banks as well as financial markets are subject to regulation, and in both cases regulators face tensions in enforcing regulations that pull in opposite directions. Regulatory actions to achieve financial stability create greater interconnectedness in the financial system.
- Bank regulation has multiple goals, and it is being increasingly harmonized, but the danger is that regulation may go too far. While regulation boosts economic

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growth to a point, beyond that point it reduces growth as the costs for banks to comply with regulation exceed its benefits to society.

- Shadow banking refers to maturity transformation being conducted by financial intermediaries other than traditional commercial banks, such as MMFs, investment banks, and hedge funds. This sector of the financial system has grown faster than depository banking in recent years and is now bigger than traditional banking in the United States. However, it provides valuable services to Main Street, including households, and traditional commercial banks also play a role in shadow banking.



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