



WP/04/120

IMF Working Paper

Private Finance and Public Policy

Garry J. Schinasi

IMF Working Paper

International Capital Markets Department

Private Finance and Public Policy

Prepared by Garry J. Schinasi¹

July 2004

Abstract

This Working Paper should not be reported as representing the views of the IMF.

The views expressed in this Working Paper are those of the author(s) and do not necessarily represent those of the IMF or IMF policy. Working Papers describe research in progress by the author(s) and are published to elicit comments and to further debate.

This paper articulates a logical foundation—drawn from disparate literatures—for understanding why safeguarding financial stability is an important economic policy objective. The paper also explains why private aspects of finance provide broader social economic benefits and have the characteristics of public goods. Unique aspects of finance are examined, as are the linkages between finance, money, and the real economy. Sources of market imperfections in finance are identified and their implications are analyzed. The arguments imply that reaping the full private and social economic benefits of finance requires both private-collective and public-policy involvement as well as a delicate balance between maximizing the benefits of positive externalities (and public goods) and minimizing the costs (including potential instabilities) of other sources of market imperfections in finance.

JEL Classification Numbers: G14, G18, E42, E44, E51, E58, D52, D61, D62, D82, H41

Keywords: Finance, Financial Stability, Money, Market Failures, Public Goods

Author's E-Mail Address: gschinasi@imf.org

¹ This paper is part of a manuscript on financial stability. I gratefully acknowledge the IMF's financial support under its Independent Study Leave Program. I also gratefully acknowledge the support and encouragement of De Nederlandsche Bank (DNB) and the European Central Bank (ECB) while visiting them in 2003 and 2004, especially Tommaso Padoa-Schioppa, Mauro Grande, and John Fell at the ECB and Henk Brouwer, Jan Brockmeijer, Aerd Houben, and Jan Kakes at the DNB. The paper benefited from discussions with, and comments from, Ivan Alves, Michael Bordo, John Fell, Bob Flood, Aerd Houben, Jan Kakes, Charlie Kramer, Leena Mörntinen, Tommaso Padoa-Schioppa, Eric Peree, Alfred Steinherr, and James R. White. I also received useful comments during seminars at the DNB, the ECB, the European Investment Bank, and the University of Hong Kong.

Contents	Page
I. Motivation and Logic of Paper	3
II. Finance and Its Relation to Money	6
A. What Is Finance?	6
B. How Is Finance Linked to Money?	7
Services of fiat money	7
What is unique about finance?	9
III. Private and Social Economic Benefits of Finance	13
A. Finance Facilitates Intertemporal Economic Processes	14
B. Modern Essence of Finance: Pricing and Allocating Risk	15
IV. Finance, Fragility, and Evolving Social Arrangements	16
A. Liquidity, Leverage, and Fragility	16
B. Financial Institutions and Markets as Evolving Social Arrangements	18
V. Public Policy Aspects of Finances	20
A. Sources of Market Imperfections in Finance	21
Externalities	22
Public goods	24
Incomplete information	27
Incomplete markets	28
B. Fiat Money as a Public Good?	29
C. Finance and Financial Stability as Public Goods?	30
D. Market Imperfections in Practice: Some Produce “Too Little of a Good Thing” and Others “Too Much of a Bad Thing”	33
VI. Policy Implications and Conclusions	35
References	39
Boxes	
1. Sources of Market Failures in Finance	22
2. Samuelson’s Store of Value as a “Social Contrivance” Providing a Public Good	31
Figure	
1. Evolution of Modern Finance	18
Tables	
1. Finance as a Temporary Exchange of Services	11
2. Relative Values of Services	12
3. Typology of Private and Public Goods in Terms of Characteristics	26

I. MOTIVATION AND LOGIC OF PAPER

Modern finance is often portrayed as a purely private activity having little to do with, or little need for, private-collective or government involvement. Likewise, the benefits of finance are seen primarily, if not exclusively, as being conveyed to private counterparts engaged in specific financial activities and markets. Although there is some truth in this characterization, effective financial systems rely heavily on private-collective and public-policy involvement; provide social economic benefits; and have some, if not all, of the characteristics of a public good. Although this public-good nature of finance may be well understood and taken for granted in financial-system policymaking, it is neither widely understood nor accepted more broadly.

Practitioners working on financial stability issues within policymaking institutions (both domestic and international) share some understandings in their practical research and policy work. Just to cite a few examples, it is taken for granted that

- finance is fundamentally different from other economic functions, such as exchange, production, and resource allocation;
- finance contributes importantly to other economic functions and facilitates economic development, growth, efficiency, and ultimately social prosperity;
- the meaning of financial stability is more or less clear, even though there is not a rigorous and widely accepted definition of it;
- financial stability is an important social objective—a public good—even if it is not widely seen as being on a par with monetary stability; and
- monetary and financial stability are closely related, if not inextricably bound together, even though there is no consensus on why this is so.

Although there seems to be this consensus, there is controversy about aspects of it within the broader international economic and academic communities. Some believe financial stability is not an independent objective and, in any case, would be maintained as long as macroeconomic stability is maintained. Some believe and have strenuously argued that there should be a clear, institutional separation between mandates for ensuring monetary stability and financial stability; countries have implemented such an approach and others are considering doing so. Others see as inconsequential or as minimal the importance of finance in providing public goods, advocate a minimalist role for the state in regulating finance, and prefer private sector governance and solutions to problems and crises when they arise.

Academic and policy literatures cover many specific financial stability topics in considerable depth and in some areas provide rigorous anchors for debating both substantive and policy issues. For example, there are extensive literatures on banking dealing with the role and fragility of banks in finance, the costs and benefits of deposit insurance, and bank failures and restructuring. There are also growing literatures on market sources of financial fragility and sources of systemic risk more generally.

Despite considerable intellectual progress, the literatures, taken together, do not provide a cohesive framework for either analyzing systemic issues and controversies, or designing policies to optimize the social net benefits of finance. Moreover, within the financial-stability-policy community, there does not yet exist a fully articulated and widely accepted logical foundation that joins the elements of this consensus into a cohesive, consistent, and comprehensive whole. The articulation of such a logic could help identify where intellectual differences lie and help establish a foundation on which to build a financial stability framework.

The objective of this paper is to propose such a logic—drawing on existing ideas—with the hope that it will stimulate debate on what such a foundation might be. The paper is organized as follows.

Section II examines the relationship between finance and fiat money, organized around the conventional services of money, and identifies several important and unique aspects of finance. It is argued that finance existentially entails uncertainty about human trust, which is the source of both its strengths (facilitates economic processes and efficiency) and weaknesses (potential for market imperfections and fragility).

Building on these important characteristics, Section III discusses the enormous economic benefits provided by an effective process of finance. These benefits originate in the ways finance improves economic efficiency and, more specifically, facilitates important economic processes, such as resource and risk allocation, wealth accumulation, growth, and ultimately social prosperity.

Section IV examines aspects of finance that can (temporarily) reduce private and social benefits or, worse, create the potential for financial and economic instability. It also briefly discusses some of the social arrangements that have evolved to deal with this potential fragility.

Section V applies the economics of the public sector to finance. In addition to the usual sources of inefficiency in finance—such as asymmetric information and incomplete markets—this section argues that widespread access to an effective process of finance is associated with significant positive externalities and also has the characteristics of a public good.

Section VI discusses some of the main public policy implications. One of them is that achieving the full private and social net benefits of finance requires maintaining a delicate balance of private-collective and public-policy involvement in the main constituent parts of finance (infrastructure, institutions, and markets). In some countries, this may require greater reliance on market discipline, while in others, it may require greater reliance on government involvement. A second implication is that achieving these objectives also requires a balance between maximizing the social benefits (associated with positive externalities and public goods) and simultaneously minimizing the social costs (of the other sources of market imperfections). In countries with undeveloped markets, this may mean greater emphasis on

building the constituent parts of finance that create the positive externalities and public goods, while in the more advanced markets, this may require greater emphasis on warding off the adverse consequences of other sources of market imperfections.

Because the arguments of the paper are drawn from disparate literatures, it might be useful to preview the logic of the arguments.

Fiat money alone provides ultimate liquidity in the form of finality of payment and has the quality of anonymity: a dollar is accepted in the United States irrespective of who is exchanging it. Together these characteristics make fiat money society's surrogate for trust in exchange. Used as a store of value, fiat money is less perfect and unique, since its effectiveness depends on the ability of a small group of public servants to maintain its value. Thus, as a store of value, the use of fiat money entails an element of uncertainty.

Throughout recorded history—and even before the introduction of paper moneys in the mid-seventeenth century—societies have invented ways of creating and using alternative stores of value. Broadly construed, this is *finance*: a process, comprised of private contracts and social arrangements (laws, institutions, codes of conduct, governance), that produces and exchanges stores of value. More specifically, finance creates instruments of no intrinsic value that enable private counterparts to temporarily transfer the finality-of-payment services of some form of money to others *in exchange for a promise* to reverse the transfer later either for an equal or greater value or to share in some reward (profit) in the future. Accordingly, finance existentially embodies uncertainty about human trust and is closely tied to the characteristics, value, and dynamics of money.

Even though finance can be seen primarily as a dynamic network of private contracts, arrangements, and transactions, it provides both private and social benefits. It does so by enhancing and redistributing the characteristics and services of money, including as a public good. In so doing, finance facilitates and enhances opportunities for intertemporal economic processes and, ultimately, social prosperity. More specifically, it facilitates important economic processes: a greater amount of trade and exchange, production, savings, and investment; a more efficient allocation of resources; greater and more effective opportunities for wealth accumulation and economic development and growth; and greater opportunities for, and effectiveness in, unbundling, repackaging, pricing, and trading financial and economic risks.

However, there are both private and social downside risks associated with aspects of finance. When the veracity of promises to pay comes to be doubted, uncertainty and risk tend to rise: financial counterparts reassess, reallocate, and reprice uncertainty about trust. This process usually occurs in an orderly fashion. But often enough it does not. In a worse-case scenario, widespread uncertainty about trust in finance leads to panic and a dramatic rise in the demand for society's surrogate for trust—fiat money—until trust and confidence are restored. Because of the linkages between finance, fiat money, intertemporal economic processes, and uncertainty about trust, when financial stability is called into question,

monetary instability—and ultimately economic instability more generally—become important risks. Causality may run from monetary instability to financial instability as well.

II. FINANCE AND ITS RELATION TO MONEY

In examining financial stability issues, and especially in defining financial stability, it is beneficial to consider the distinguishing characteristics of finance—as compared with other important economic processes such as production, exchange, and savings and investment.² For example, in monetary economies, although economic processes make use of some or all of the characteristics of fiat money, finance is closely related to them. Similarly, while production and exchange involve elements of human trust, finance uniquely (if not existentially) embodies uncertainty about trust. This is so because finance comprises promises that can be broken, for example as between borrowers and lenders. In these and other ways, finance plays important and unique roles in facilitating other economic processes. Recognizing these unique aspects of finance helps to explain why it is useful to think of finance and financial stability as conveying externalities, and in the extreme public goods. These and other concepts and issues are examined in this section.

A. What Is Finance?

According to Merriam Webster's Collegiate Dictionary, 10th Edition:

“...finance is: (1) money or other liquid resources of a government, business, group, or individual; (2) the system that includes the circulation of money, the granting of credit, the making of investments, and the provision of banking facilities; (3) the science or study of the management of funds; (4) the obtaining of funds or capital.”

The foregoing analysis will make extensive use of the first two definitions, and more use of the second than the first. These definitions are not entirely useful or complete, however. First, Webster's definition does not provide a sense of what the “system” accomplishes or how it fits into the broader economic system. Second, these definitions do not provide a sense of whether finance is an end itself or just a means to an end. As an industry, finance produces measurable value-added and creates jobs. But there are other, less direct and measurable benefits that may in fact add up to significantly more of a contribution than the measurable value-added.

The benefits of finance—both as a process and as an activity—can be seen as originating primarily and broadly in the ways in which finance enhances the overall efficiency of resource and risk allocation, both spatially and inter-temporally. By helping the economy to allocate resources to their best uses through time, and allocating risks to those

² Schinasi (2004) proposes a working definition of financial stability.

most capable of managing them, finance facilitates and supports the processes of production, wealth accumulation, economic growth, and the prosperity of societies more generally.

Accordingly, and for the purposes of designing and managing financial-system policies, finance can be seen primarily as a means by which important functions of the economic system are facilitated or achieved. This does not mean that finance does not directly contribute to production or that it plays a subordinate role. Throughout history, the need and search for more and more effective finance often has led to discoveries and innovations in finance that themselves have had a lasting, if not a great, impact on economic systems and their evolution, at times for good and evil.³ To refer to two examples, consider the positive, perhaps revolutionary impact of the emergence of banking in Europe in the fifteenth century and of the invention of fiat money in the seventeenth century. These elements of finance did not exist during most of recorded human history.

Economies still exist that have not developed finance to a sufficient extent to reap these broader benefits. Moreover, in developed and even mature financial systems, the benefits of finance cannot be taken for granted. When finance is not performing properly—even in highly developed financial system—it is likely to be reflected adversely in the way an economy is performing. This usually occurs by reducing the efficiency and effectiveness of finance in facilitating resource allocation—as during a “credit crunch”—or worse by causing the potential for market imperfections and systemic problems (or systemic risk)—as occurs during the onset of financial crises.

B. How Is Finance Linked to Money?

In monetary economies, finance is intimately bound to the unique services of fiat money or any other legal tender (e.g., convertible money).⁴ While this may be obvious, it is not trivial, as examined in the following discussion of the roles of fiat money and its relation to finance.

Services of fiat money

Although fiat money has no intrinsic value, it provides essential services that are part of every economic transaction in a monetary economy. Two of these services are a unit of account and a medium of exchange. The second role is more unique and defining than the first, in that fiat money alone embodies the *finality of payment* in transactions. Until fiat money is actually received by a party to a transaction (including in the form of an electronic

³ This is a recurring theme in Kindleberger (1993): see page 5, for example.

⁴ Fiat money is a government supplied means of payment—legal tender—of no intrinsic value. I am grateful to Michael Bordo for suggesting that many of the points made below about fiat money also pertain to convertible moneys (which is what most countries had as legal tender up until the 1930s) and to fiduciary moneys (such as bank money).

transfer to a bank account), there will be uncertainty about whether an economic exchange of full contracted value has actually occurred. For example, and as is obvious, the certainty of receiving full value is immediate in a simple *exchange* of a commodity for fiat money.^{5 6}

More generally, any *money* that is universally accepted as a medium of exchange facilitates trade and exchange. It could be a legally issued fiat currency or a *derivative* money—a bank deposit—that promises to pay a fixed amount of fiat currency on demand.⁷ Money facilitates trade and exchange by separating the timing of the receipt of income as a requirement for making expenditures. In this way, money removes an important individual constraint on economic activity.

Equally important, money facilitates efficient trade and exchange by eliminating the “double coincidence of wants” that is characteristic of, and intrinsic to, trade and exchange in barter economies.⁸ In a barter economy, this is the costly requirement of finding someone who possesses the commodity you want to purchase, and who wants to purchase the commodity that you possess. If you have apples and want oranges, you would need to search and find a person who has oranges and wants apples, meeting at a time and place, and decide how much to trade at what price. You may have to find several individuals and meet in several places and times to fully satisfy your demand for oranges. The search and transactions costs in barter economies are very high.

In a monetary economy, no such search and transactions costs are necessary: all you need to do is find someone who wants to sell the good for money. In being universally accepted as supplying a medium-of-exchange service, money makes the processes of trade and exchange more efficient by driving search and transactions costs to a minimum. In this way, the introduction of money enhances the efficiency of trade and exchange.

⁵ According to Shubik (2000), “Historically, weights of some commodity preceded coinage and were used for exchange around five thousand years ago in Babylon and Egypt. Coinage in precious metals entered trade around 630 BC and within a few years of its introduction in Asia Minor spread over the civilized world. Paper money became a serious economic force around the end of the seventeenth century with the founding of the Bank of England and the late twentieth century brought with it money as a pure abstraction.”

⁶ According to Kindleberger (1993), “The bill of exchange was a powerful innovation of the Italians in the thirteenth century that economized on the need to barter, clear books face to face, or to make payments in bulky coin, plate, or bullion...by clearing or canceling a debt owed in one direction by one owed in the other or, more accurately, by one owed in another.” He goes on to observe that, “Credit was involved in dealing in bills even when the request for payments was ostensibly at sight. Mails of the day took time. Bills were payable at sight, at “usance,” or sometimes half-usance or double usance. Usance was the standard credit period for a given trade.” pp. 41–42.

⁷ See Tobin (1992).

⁸ Jevons (1871) coined this phrase.

It is reasonable to ask: if fiat money has no intrinsic value, why is it universally accepted? The answer is both complicated and unsatisfying, but it also introduces an important human element of exchange. In effect, fiat money is used as the universally accepted means of payment because it is expected and *trusted* to be accepted by others to be used as such. Because of this trust, it becomes self-fulfilling that fiat money becomes the universally accepted medium of exchange. Fundamentally, in providing a vehicle for the finality of payment, fiat money is an *economy's surrogate for trust* in trade and exchange.⁹

A third service that can be provided by fiat money is that of a store of value. That legal tender can play this role is most obvious when the medium of exchange (the currency) is a commodity like gold or silver coins. But even for these commodity monies, it cannot be taken for granted that their values will be maintained through time in terms of their purchasing power of other goods. Unlike with the first two services, the effectiveness of fiat money in providing a store-of-value service cannot be decreed by the government that issues fiat money, unless the government can ensure the maintenance of value of the currency.¹⁰

There are other incentives to create substitute stores of value. It would be surprising in any economy if the distribution of fiat money usually matched perfectly the trade and exchange needs among individuals. Instead, it is reasonable to expect that at any given time some individuals would have more, and others less, than the amount of fiat money required. There are likely to be some individuals who might be willing to pay something for the use of the medium-of-exchange services of fiat money in order to obtain purchasing power that they do not presently have, but which they expect to earn in the future. At such times, it would seem that conditions would be favorable for a temporary exchange of fiat money in return for a promise (an IOU) to return it, if only the promise of return could be properly valued and priced, if not guaranteed.

What is unique about finance?

Because economic agents typically prefer not to store value for long periods of time in the form of fiat money, private contracts between third parties—financial instruments—have been created that provide both the store-of-value service (ownership claims on future income in the form of financial assets) and the medium-of-exchange service (for example, one can pay for a meal with a check drawn on a bank) of fiat money. But these inter-temporal

⁹ Shubik (1999) notes on page 33: “The unfortunate custom of talking about bank debt, whether in the form of private bank notes or deposits, as money has added considerably to the confusion and has made it more difficult to appreciate the critical role of fiat or outside money as the surrogate for trust in a modern economy.

¹⁰ This comes close to raising the issue of monetary stability and its relation to finance and financial stability, as in Padoa-Schioppa (2003), page 274: “. . . the role of central banks in financial stability is part of their genetic code. It was—and, I would say, still is—an inseparable component of their role as the bankers’ banks and of their monopoly on ultimate liquidity.” Using somewhat different arguments, Schinasi (2003) argues that central banks have a natural role to play, and interest, in ensuring financial stability.

contracts voluntarily re-introduce *uncertainty and risk about human trust*, a defining aspect of finance. On the one hand, the re-introduction of uncertainty distinguishes finance from the means-of-payment services of fiat money. On the other hand, it allows finance to create potentially superior near-fiat-money substitutes as stores of value (the most obvious of which is bank credit). Finance can do this successfully only to the extent that uncertainty about trust can be priced and risk-managed. As will be examined below, the creation of fiat-money-substitutes for inter-temporal exchange is the *essence of finance* and financial activities.

How does finance differ from exchange?

To see the distinction more concretely, consider the elementary and rarefied example of an exchange of money for a perishable good, say an apple. In such an exchange, both the unit-of-account and medium-of-exchange service are obviously relevant. There is an exchange of ownership and possession of the two items with no intention of reversing or undoing the exchange at some later time. *The exchange of equal value, ownership, and possession is final.* Fiat money is accepted because it embodies the value of the commodity at that point in time, and it is *trusted* by the recipient of fiat money that the money could be used in other transactions immediately.

In this common exchange, the store-of-value service of money is not playing a major role if it is playing one at all. However, suppose the recipient of the money does not expect to use it soon and/or is uncertain about whether the value of money will be sustained until such time as the money will be needed. Then the recipient might seek alternative and superior ways of storing future purchasing power (wealth) in some other value-safe form, or even in an alternative that might enhance the stored value. This would require finding another individual that wanted (or needed) to increase the amount of money they possessed, either because they needed more of the medium of exchange or wanted to use money as a store of value.

Essence of finance

But what would the provider of fiat money accept in return? The answer is: a *promise* to pay back and enhance the value of the fiat money at some future date. This is *finance: a temporary exchange of the means-of-payment services of fiat money—society's surrogate for trust in exchange—in return for the promise of a superior store of value* (See Table 1). In other words, finance entails giving up liquidity now (temporarily) for the promise of a future higher return.

Table 1. Finance as a Temporary Exchange of Services

	Fiat Money	Finance
Supplier of Finance	Sells Finality of Payment Service	Buys Promise of Superior Store of Value Service
Demander of Finance	Buys Finality of Payment Service	Sells Promise of Superior Store of Value Service

Unlike in *instantaneous and final* exchanges of fiat money for a commodity or physical asset,¹¹ finance involves uncertainty and risk about human trust, the same element of trust that fiat money is designed to eliminate in instantaneous trade and exchange. But in re-introducing this uncertainty, finance potentially creates superior stores of value that facilitate *inter-temporal* exchange and other economic processes.

In finance, the initial exchange is followed by at least one other exchange between these two parties to *reverse* the initial exchange. This relationship in time between the supplier and demander of fiat money is based on the promise that the transfer will be reversed in the future: the exchange is not a completed transaction. *In essence, finance is a temporary exchange of the finality-of-payment services of fiat money for a promise involving uncertainty about human trust.*¹²

More tangibly, debt contracts promise to pay back a fixed amount, and in most cases a stream of interest payments. Equity contracts promise to pay back a share of the firms

¹¹ Note that while financial transactions are exchanges of fiat money for an asset (the promise of a superior store of value), the transfer is temporary. This is fundamentally different from an outright purchases of physical assets, such as real estate, which are final exchanges of fiat-money for physical assets. This difference remains even when the outright purchase is financed with a loan, except when the physical asset is used as collateral for the loan.

¹² Finance was probably born with the first loan, and it may or may not have involved money as the unit of account or as the medium through which the loan temporarily transferred purchasing power from lender to borrower. According to Kindleberger (1993), page 21, while some historians have seen the natural progression of economic intercourse as evolving from barter, to monetary economies, and then to credit economies, the evidence contradicts this view. Credit was widely used in medieval times, and all three co-existed until modern times. “As late as the nineteenth century, the rural economy used a great deal of barter in such a country as France, the national economy organized along the roads used silver, and the international economy operating in ports and major financial centers used bills of exchange—a credit instrument—and settled balances that could not be cleared by bills in gold and silver payments (Braudel, 1977).” According to Shubik (2000), “Credit has existed at least five thousand years as is evinced by the records of debt instruments in Sumer and the other ancient kingdoms in the fertile crescent. The granting of credit predated the invention of coinage by at least two thousand years.”

profits, either in the form of dividends, or through a rise in the value of the shares, or both. If there is a lack of trust and/or few ways of eliminating trust as a consideration in financial transactions (such as collateral or hedging opportunities, for example) then financial activity will be quite limited between the parties involved.

While other economic activities and relationships involve aspects of human trust, in finance human trust is an essential part of the activity. For example, trust is involved in a relationship between workers and business owners: the owner of the firm promises to pay the worker for production, and the worker promises to produce a high-quality product. But this trust relationship differs from that in finance in several important ways. First, the promise in finance entails the possibility of the loss of principal (the amount of the loan): no such risk is typically taken on either side of the worker-owner promise. Second, the worker-owner promise involves an exchange of tangible items (goods produced for fiat money) whereas finance involves an exchange of a promise for fiat money. Third, the uncertainty associated with the worker-owner promise can be reduced significantly, in part by shortening the time between production and income payments to a week or two: in principle, workers could be paid every day, which would significantly reduce the promise element of the relationship.

More broadly, we can think of fiat money and finance as providing different degrees of value-added in supplying specific services to members of society (see Table 2). In normal times, fiat money is a superior means of payment than are most forms of finance: both can

Table 2. Relative Values of Services

	Fiat Money	Finance
Unit of Account	Absolute	Imperfect
Finality of Payment	Absolute	No
Liquidity	Highest	Imperfect
Store of Value	Useful	Potentially Superior
Anonymity	Absolute	Imperfect

supply the service, but the reliability of vehicles that embody uncertainty about human trust clearly are inferior purely as means of payment, perhaps with the exception of bank money, and close substitute for fiat money as a means of payment. On the other hand, in normal times, finance has the potential to offer superior store-of-value services over those of fiat money, and in so doing offers superior services in facilitating inter-temporal exchange. Both vehicles require the user to take some risk, but at least finance offers a higher reward.

The analysis in this section might have been elementary and somewhat tedious. Hopefully, this discussion has: (i) usefully examined the difference between fiat money and finance; (ii) elucidated the inextricable linkages between finance and fiat money; (iii) pinpointed the essence of finance; and (iv) clarified the distinction between financial transactions and final exchanges of fiat money for physical goods and assets.

Finance uniquely complements the characteristics and qualities of money, for example, in the ways in which it facilitates (through “lending”) the preservation and potential growth of purchasing power through time, or in the ways in which it facilitates (through “borrowing”) the transfer of future earnings into present purchasing power. While these “financial” transfers through time (and space) could be performed, in principle, without the existence of universally accepted money, they would be performed with significantly less effectiveness and efficiency, and in significantly smaller amounts. Indeed, prior to the introduction of convertible monies in the eighteenth century, trade, exchange, and finance flourished in some parts of the world, but with significantly less breadth, scope, acceptance, and efficiency.

The discussion in this section has also highlighted that there are several unique and related characteristics of finance and financial activities in modern monetary economies, in that finance is:

- the temporary, inter-temporal exchange of the finality-of-payment services of fiat money in return for the promise of a superior store of value;
- a trust agreement between counterparts
- existentially linked to uncertainty.

III. PRIVATE AND SOCIAL ECONOMIC BENEFITS OF FINANCE

Because of its unique qualities, finance bestows enormous benefits privately and socially, and plays fundamental roles in facilitating the overall performance of economic systems. These private and social benefits and roles have grown in importance in the latter half of the twentieth century. Throughout the course of the post Second World War period, and beginning in earnest in the late-1970s efforts towards financial liberalization, the contribution of finance to the performance of economic systems has increased significantly in various dimensions, and in some cases immeasurably.¹³ Moreover, financial activities also have grown in importance and in some economies comprise a relatively large direct share of employment and the production of final goods and services.

¹³ See the last several years of the IMF's, *International Capital Markets—Key Developments, Prospects, and Policy Issues*.

Employment and production in the financial industry is perhaps the most visible and measurable contribution of finance to the performance of real economies. But it may not be the most fundamental or important: finance contributes in several other, perhaps even more important ways.

A. Finance Facilitates Intertemporal Economic Processes

Finance can be thought of as one important element of an economic system, one that facilitates its ability to perform inter-temporal economic functions. In this respect, finance can be likened to other parts of an economic system's underlying infrastructure that together support (or in its absence fail to support) the performance of the economic system, such as the rule of law and enforcement of it. Similarly, finance provides fundamental or basic services to the entire economy in much the same ways that "utility" industries supply very basic needs, such as water, power, and communications services. It is difficult to envision the benefits of modern economic life without these essential services; so too with the essential services of finance.¹⁴

Three important roles of finance in modern economies can be distinguished.

First, effective finance facilitates the efficient allocation of real economic resources (now including human capital) at any given time and especially across time. It does so in many respects but importantly by facilitating the matching of savers interested in postponing their consumption with end-user investors (most often through intermediaries) desiring to expand the capital base from which they can engage in productive activities.

Second, finance contributes to the performance of the real economy by facilitating the more effective management of the process of wealth accumulation for individuals, businesses, governments, and nations. Wealth (capital) accumulation is one of the more fundamental requirements for a society to develop and grow. The more effective are a society's financial mechanisms in facilitating wealth accumulation and management, the greater are the opportunities for this society to enhance and sustain development and growth over time, and to weather the negative impact of unanticipated and unavoidable adverse events.

¹⁴ Levine (2003) and World Bank (1999) provide overviews of empirical work on the positive correlations between finance and economic development and growth. An important caveat is that the causality between the extent of financial intermediation and economic growth is difficult to determine empirically, as these variables are inextricably linked and may both be endogenously determined. Theoretical approaches to this issue are developed in Acemoglu and Zilibotti (1997) and Greenwood and Jovanovic. Recent emerging-market financial crises have highlighted the important adverse consequences that a dysfunctioning financial systems can have by either creating or exacerbating economic recessions, depressions, and crises. See various editions of the IMF's *International Capital Markets: Key Developments, Prospects, and Policy Issues*, for example IMF (1995 and 1998).

In the more highly developed and modern economies, the process of capital accumulation extends to human-capital accumulation. Individuals are now able in many economies to borrow against future earnings in order to enhance the prospects of their future levels of productivity, either through secondary and tertiary levels of education or vocational and job training.

A third role played by modern finance—one that has become increasingly important in the global economy and financial system—is its ability to facilitate the management (including the diversification) of both economic and financial risks. Modern finance plays this role by providing greater opportunities for the unbundling, repackaging, pricing, transferring, and ownership of unbundled financial and economic risks, once the original economic or financial transaction has occurred. In fact, the essence of finance as defined earlier can be seen as facilitating a process of transforming the risks and uncertainties associated with human trust (essentially counterparty risk) into other not necessarily easily measurable, marketable, and manageable components (such as market and liquidity risk). Likewise, one could conceive of a useful alternative definition to conventional definitions of financial systems along these same lines. That is, finance and the financial system can be seen as primarily as a very large and dynamic network of financial contracts facilitating a vast diversity of economic functions.¹⁵ It is worthwhile examining this function of finance in greater detail, as it more-or-less encompasses an increasingly important and fundamental role of finance in advanced countries and mature markets.

B. Modern Essence of Finance: Pricing and Allocating Risk

The development of derivatives markets in the past several decades, and in particular their maturation in the late 1990s, is perhaps the best example of the more fundamental risk-allocation functions of finance, particularly in modern economic systems.¹⁶ For example, through the use of simple derivatives, such as interest-rate swaps, the financial risks inherent in a fixed-interest-rate loan can be easily transferred to another investor and swapped into a floating-interest-rate loan. Likewise, through the use of credit derivatives, the credit risk associated with a traditional loan can readily be swapped for another credit or insured; the loan could also be sold outright, perhaps through the securitization of the loan or a package of them (known as asset-backed securities).

In allowing for the unbundling and repackaging of risks, derivatives markets have helped in facilitating the transfer of economic and financial risks to those most willing and hopefully capable of managing these risks. In so doing, finance in general, and derivatives in particular can help individual economic agents diversify their portfolio of economic and

¹⁵ This is developed further in a forthcoming companion paper that defines financial stability.

¹⁶ For their role in modern banking, see Schinasi, and others (2000).

financial risks. At the same time, finance, and derivatives in particular, benefits the economy as a whole, in part by providing mechanisms and opportunities for spreading economic and financial risk taking throughout the economy. It also provides alternative channels for financing the same economic activity. As risk-transfer processes become more highly developed and mature, they can help to protect economic agents, and the economy and its financial mechanisms by providing a diversity of opportunities for risk sharing and also burden sharing when adverse consequences actually occur in particular markets or in the economy as a whole.

The spreading of techniques of modern finance within economies has been associated with a tendency to make financial markets more complete. As a set of markets become more and more complete, they can be seen as providing greater opportunities for creating private insurance contracts against a greater number of economic and financial risks. For example, the development of asset-backed security markets has facilitated the ability of individuals in many countries to obtain consumer loans and home mortgages, and for students to obtain loans for education and job training. Before asset-backed markets were developed and reached a level of maturity, many economies could not provide these financial services and transfer these risks, either among economic agents or through time.

In developing, refining, and providing these new and modern techniques of finance, the mature financial systems are in fact finding new ways for economic systems to capture the full benefits of finance. They are doing so, in essence, by finding more (and hopefully more precise) ways of pricing and managing the risks inherent in temporarily transferring to other agents the purchasing power of money, including the risk and uncertainty about the human trust element in every financial instrument and transactions. Modern finance has also made more transparent this human-trust element in transactions, and in so doing has identified ways to minimize the uncertainty of human trust, for example, by being better able to price-in the market risks associated with collateral that acts as a surrogate for trust in many financial transactions.

IV. FINANCE, FRAGILITY, AND EVOLVING SOCIAL ARRANGEMENTS

A. Liquidity, Leverage, and Fragility

As has been suggested, but not yet explicitly stated, fiat money provides the ultimate *liquidity* services. In providing universally accepted means-of-payment services, fiat money embodies instantaneous purchasing power with the lowest risk possible.

Finance enhances the liquidity-services of fiat money. It does so by creating instruments that simultaneously provide superior store-of-value services to one counterpart and access to liquidity to the other counterpart, both spatially and inter-temporally. This occurs primarily in the form of promissory notes whereby one person's promise becomes another person's potential liquidity, provided the promise is transferable (marketable) with relative ease, if not instantaneously. In this way, finance can facilitate and fuel a pace of economic activity far beyond what fiat money alone can support.

Although finance provides superior store-of-value services, its incremental additions to the pool of liquidity are less perfectly liquid than fiat money, because finance embodies counterparty uncertainty and risk.¹⁷ Taking a well understood example, traditional bank demand deposits are special forms of promissory notes, which, in being widely accepted are very close substitutes to fiat money. But they are not universally accepted unconditionally in the way fiat money is. A bank's promissory note provides liquidity to the economic and financial system, but it is less liquid than fiat money because it entails counterparty risk: which is, in part, why banking is a fragile business. Promissory notes issued by individuals are even more imperfect.

Consequently, there are both potential benefits and costs associated with finance. On the one hand, finance enhances the private and social benefits of fiat money, in part by enlarging the pool of liquidity available for production, consumption, exchange, and in part by facilitating and enhancing the efficiency of economic processes (discussed above in Section III). On the other hand, finance inherently embodies uncertainty—about fulfilling promises—and thereby changes the nature of the original pool of pure liquidity with instruments of less perfect liquidity and acceptability than fiat money. This introduces an element of uncertainty in individual private transactions, which has the potential for imposing costs (in terms of lost efficiency) for un-involved third parties because of its potential adverse effects on liquidity. In this way, the inherent uncertainty in finance introduces a source of potential fragility and instability in financial markets that does not exist in most other markets in which tangible goods and services are traded. In this important respect finance is distinguishable from most other economic activities. Overall, the former, more positive features of finance provide efficiency enhancements and social benefits, while the latter, more negative features imply the potential for instability and negative externalities (or contagion).

As a result, it is reasonable to see aspects of finance as entailing both private and social tradeoffs (and tensions). On the one hand, by embodying (and internalizing) uncertainty and risk about human trust into tangible intrinsically value-less instruments, finance enhances both private and social welfare. On the other hand, by embodying a fragile human emotion like trust, finance is existentially fragile and, therefore, subject to instability under certain conditions. There are (difficult to know and measure) limits to how far financial activity, liquidity, and leverage can be extended before too much finance is created on too little trust. When this situation is reached, imbalances tend to emerge and accumulate if left unchecked or if not self-corrected.

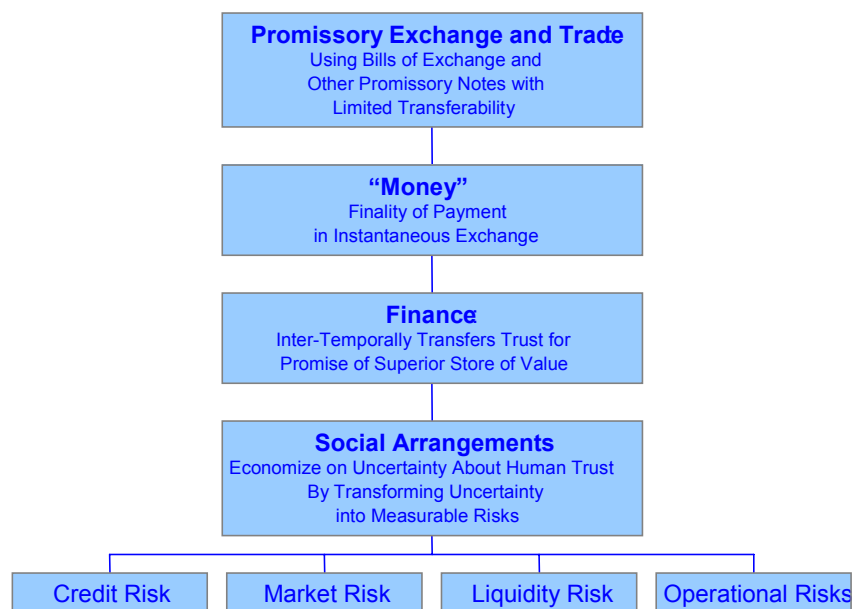
¹⁷ In his *Treatise on Money* (Vol. II, p. 67), Keynes noted that one asset (or store of value) is more liquid than another if it is “more certainly realizable at short notice without loss.”

B. Financial Institutions and Markets as Evolving Social Arrangements

As already suggested, the atomic particles of finance are human promises to pay(back) fiat money to those willing to depart with its services temporarily. The willingness of savers to do so involves a degree of trust that the promise will be honored.

In primitive or undeveloped economies, there would tend to be significant uncertainty about whether promises would be kept, and limited enforceability of promises should they be broken (see Figure 1, Evolution of Finance). Almost by definition and classification, developed and modern societies have created social arrangements—such as social and business conventions and financial institutions and markets—in part to provide liquidity and pool risk and thereby to facilitate these intertemporal exchanges involving human promises and trust. These social innovations range from fundamental concepts of law and property rights, to institutional forums and structures that organize, process, and monitor information and pool risk taking. These forums can be seen as running along a continuum roughly from individuals to firms that provide intermediary services—or indirect finance—and extending to markets (both formal and informal) that allow individual lenders and borrowers to directly find matches of financial interests and comfort levels with uncertainty about human trust.

Figure 1. Evolution of Modern Finance



To consider this further, these social arrangements—and in particular, financial institutions and markets—can be seen as society’s way of economizing on—or minimizing—

the need for individuals to rely on human trust in finance.¹⁸ That financial institutions accomplish this is now conventional wisdom, and this can be seen most clearly by considering the franchise of a traditional bank. On the one hand—on the asset side of their balance sheet—banks specialize, and are perceived as having a comparative advantage, in gathering, processing, and monitoring information on those members of society that want to issue promissory notes in return for temporary access to and use of fiat money. Accordingly, banks own assets in the form of promissory notes issued by such individuals (and firms). In return, banks provide liquidity in the form of access to fiat money, usually in the form of a deposit. On the other hand—on the liability side of their balance sheet—banks issue their own special kind of promissory note—demand deposits or checking accounts—including to those members of society that would temporarily lend their excess fiat money to others, but who have neither the time nor the expertise to enter into bilateral relationships with potential borrowers in order to assess human trustworthiness. By issuing demand deposits, banks offer individuals the opportunity to store purchasing power and wealth in the form of a (usually) relatively safe asset with some commensurate return for the risks they are taking, namely of trusting the bank to pool and invest funds wisely. In this way, banks pool the liquidity of depositors and make it available to others. This franchise allows banks to profit from matching savers and borrowers.¹⁹

The bank franchise can reasonably be seen as one of society's arrangements for internalizing and pooling risk and uncertainty about human trust. In the absence of this pooling arrangement, uncertainty about trust would necessarily be embodied in bilateral promissory notes between individual savers and borrowers. By eliminating this need for finding a "double coincidence of wants" in exchanging promises for trust, financial intermediaries allow individuals the opportunity to avoid the costs of gathering information on the trustworthiness of those offering promises as stores of value. Banks likewise economize on the need for firms seeking finance to find that small subset of individuals possibly willing to enter into a trust-agreement.

Financial markets are another one of societies arrangements for internalizing and pooling uncertainties about trust and they accomplish similar objectives in very different ways. Markets facilitate the direct matching of savers and borrowers in both formal organized ways (exchanges, clearinghouses, etc.) and informal ways (or over-the-counter, bilateral transactions). These forums provide information to participants relevant for judging individual creditworthiness, though less so than a bank might have. There is much more that can (and in companion papers will) be said about markets, but it would not add materially to the observations already made in this section about their basic role in finance.

¹⁸ See Shubik, 1999.

¹⁹ Diamond and Rajan, 2000 and 2002, present models that formalize a bank's franchise value and its liquidity and fragility implications.

V. PUBLIC POLICY ASPECTS OF FINANCES

As observed in previous sections—based solely on the observation that finance existentially embodies uncertainty about human trust—finance can have both positive and negative affects on economic processes and systems. Both originate in the element of trust embodied in finance, and their balance depends on the ways in which finance, as a process, facilitates the assessment, transformation, pricing, and allocation of the uncertainty and risks associated with this trust. The leaps of faith by members of society to engage in trust relationships in order to obtain private benefits have produced both *private and social efficiency (and welfare) gains* throughout human history. But, history has also revealed that confidence in trust is a *fragile* feature of human interaction in all social endeavors, including economic and financial activities. When confidence in the trust underlying economic and financial transactions breaks down, so too can the ability of markets and financial institutions to perform their basic pricing, allocative, and intermediary functions, and this break down can lead to *financial instability*. In effect, the element of human trust and whether it is strong or weak helps to determine the strength and stability of the economic and financial mechanisms that facilitate every day economic life.

A fundamental question about the balance of these efficiency and fragility aspects of finance is: *Can and will unfettered market forces lead to the right balance of these positive and negative aspects of finance?* Put another way: *Is individual rationality (utility and profit maximizing behavior) sufficient to achieve collective rationality (or socially optimal outcomes) in finance?*²⁰ If not, are there steps that can be taken to move society closer to the right balance?

These are difficult, and in some ways philosophical questions. By applying aspects of the economics of the public sector, this section tries to frame the public-policy aspects of finance and financial stability considerations, and suggests that:

- finance imposes both positive and negative externalities;
- finance existentially embodies imperfect information (uncertainty about human trust);
- access to finance—the process that provides effective store-of-value services—is a public good, as is access to a universally accepted means of payment (fiat money);
- overall, some market imperfections produce “too-little of a good thing” while others produce “too-much of a good thing;” and

²⁰ This way of characterizing the issue echoes the seminal work of Olson (1965) and Sandler (1992).

- because of this, maintaining effective finance and financial stability requires a balance between private market forces and both private-collective and public-sector action on behalf of members of society.

Before examining why fiat money and finance can and should be seen as public goods and other public policy aspects of finance and financial stability, it is useful to consider applications of the economics of the public sector to finance—and in particular the concept of a market imperfections (or failures)—to which the paper now proceeds.

A. Sources of Market Imperfections in Finance²¹

A **market imperfection** (or a **market failure**) occurs when a market outcome (or market forces) deviates from a standard used by economists to provide the economically efficient quantity and allocation of goods and services. By economic efficiency is meant an allocation of resources that leads to a combination of production, consumption, and so on, in which no individual can be made better off through a reallocation of economic resources without making some other individual worse off. Such outcomes are known as Pareto-efficient or Pareto-optimal. A fundamental theorem in welfare economics is that under well specified conditions—including perfect competition and information—the “invisible hand” of market forces will lead to economically efficient (Pareto-efficient) outcomes.

Market imperfections exist primarily because of the existence of five deviations from the definition of a perfectly competitive economy: (i) externalities; (ii) public goods; (iii) incomplete information; (iv) incomplete markets; and (v) a lack of competition. Only the first four will be examined here. (See Box 1—Sources of Market Failures in Finance.)

When there is a market imperfection, the price established in the market will not equal the marginal *social* benefit of a good and it will not equal the marginal *social* cost of producing the good. As a result, the good in question will be consumed and/or produced in quantities that are economically inefficient. This can occur even when the market price equals both the marginal *private* cost and marginal *private* benefit, which meets the economists’ definition of an equilibrium price. That is, even in what economists consider to be an equilibrium situations, there can be deviations from what is considered to be a socially optimal outcome. This is the true import of a market failure: a situation in which a sustainable equilibrium is not economically efficient and socially sub-optimal.

²¹ Some of this discussion is adapted from sections of Stiglitz (2000). In this paper, the terms “market imperfections” and “market failures” are interchangeable.

Box 1. Sources of Market Failures in Finance

Public good

- finance provides unit of account services to financial balances (+)
- finance extends universal acceptability benefits of fiat money to financial system (+)

Externalities

- trust in finance enhances efficiency in inter-temporal and inter-spatial allocations (+)
- financial system creates network benefits (+)
- finance subject to contagion and systemic risks (-)

Incomplete information

- incomplete information in finance leads to price misalignments, resource misallocation, and multiple equilibria, including liquidity and credit runs (-)
- asymmetric information between borrowers and lenders leads to adverse selection, moral hazard and credit rationing (-)

Incomplete markets

- uninsurable liquidity risks (lender-of-last resort financing) increases economic uncertainty (-)
- non-price discrimination in provision of finance leads to missed exchange opportunities (-)

Imperfect competition

- single money issuer improves services provided by fiat money and economizes on transaction balances (+)
- monopoly of money supply generates seignorage revenues with incentives for over-issue (-)
- economies of scale and too-big-to-fail considerations lead to insufficient or excessive competition between financial institutions and with new entrants (-)

(+) and (-) indicate a positive respectively negative contribution to market efficiency.

Note that a market failure is defined in terms of the economic (in)efficiency of a price and resource allocation outcome and is not defined in terms of the (in)stability properties of equilibrium. Thus, a market failure need not be associated with market instability. Also note, however, that a market failure—particularly in finance—can lead to imbalances, which in turn could create the potential for instability of one kind or another.

Externalities

An *externality* is a secondary or an unintended consequence. In finance, *externalities* arise when a financial activity imposes benefits or costs on third parties and/or in markets that are not directly involved in the activity. If the externality provides benefits, it is a positive externality; if it increases costs, it is a negative externality.²² If the activity imposes

²² A classic example of a negative externality is the production of pollution as a by-product in producing private goods.

costs on a sufficiently large number of counterparts and/or markets, it would have the potential to become systemic, and pose systemic risk. If an externality provides benefits to society at large, then it may also be a public good (see next subsection).²³

In general, an externality—negative and positive—drives a wedge between private costs and benefits and social costs and benefits. Thus, the market-determined price, quantity, and allocation between counterparts of a financial activity may not be socially optimal, implying that the activity would not be produced and consumed to the point that the social marginal costs and benefits exactly match the private costs and benefits. The less-than-optimal outcome is reached because the external costs or benefits of goods are not factored into individual and market demands and supplies, because individual consumers and producers do not directly bear the external costs or reap the external benefits. Looking at this from the demand side only, this means that goods that convey positive externalities will be under-demanded and, given rising marginal costs of production, under-produced. Similarly, goods that convey negative externalities will be over-demanded and over-produced.

Some aspects of finance simultaneously are associated with the potential for both positive and negative externalities. Banks funded by short-term deposits provide liquidity to potential borrowers and superior opportunities for risk-sharing. But at the same time, in a completely unregulated environment—even in equilibrium situations—individual banks could be exposed to bank runs and panics as a result of imperfect or incomplete information, as banks were in the early part of the twentieth century. While the former is a positive externality, the latter is a negative externality: in some circumstances, there are significant net social costs in terms of bank failures and collateral damage. As noted earlier, social arrangements and mechanisms have been implemented to rule this possibility out (deposit insurance, for example) but they themselves are costly to society, and thus there are both private and public tradeoffs.

Externalities may also arise in finance in situations where many individual market participants take independent actions that would benefit them separately and collectively only if a small number were engaged in the activity, and would be harmful to everyone if a large number engaged in the activity simultaneously. Consider the classic bank runs that occurred during the global financial panics that occurred in 1931 when many banking systems needed to be closed for several days. Bank depositors began withdrawing cash from particular banks thought by some to be experiencing difficulties. Ultimately, a bank would run out of liquid assets and close its doors, which led to concerns about solvency. Once the word spread, third-party depositors with deposits in other (also third-party) banks started questioning whether their bank would be able to make good on deposits. As the process continued, even good banks were experiencing runs, and so even good banks ran into solvency problems as their depositor base dwindled. In this case, individually rational

²³ In this sense, externalities can be viewed as a form of impure public goods; alternatively, public goods can be seen as an extreme form of externalities.

decisions—to withdraw deposits from the banking system—collectively created the negative externality of driving the banking system into the ground, which imposed costs on everyone.²⁴

There is also the possibility of liquidity runs in markets. Consider a market in which there are many traders, each of them being exposed to most other traders in the market. Even in highly efficient and liquid markets, liquidity problems can arise when traders withdraw from trading because they receive “news” that one of the traders is having difficulties obtaining financing. In reaction to the “news” that one trader is having a liquidity problem, all other traders pursue their self interest and stop trading, perhaps with all other traders. This creates a chain reaction in which liquidity is reduced in the market. To the extent that liquidity in one market affects liquidity in another, there might be *contagion or systemic* affects from the initial liquidity pressures in one market.²⁵

There are also network externalities that can capture some of the benefits of scale in finance. A network externality exists when a product’s value to the user increases as the number of users of the product grows. Each new user of the product derives private benefits, but also confers external benefits (network externalities) on existing users. Network externalities can cause market failures: for example, they may not reach their optimal size because users fail to take account of external benefits. Network externalities can also be negative and in the extreme become systemic.

Public goods

A **public good** (or **common good**) can be seen as the extreme form of a positive externality. It has two defining characteristics: (i) the producer of the good is unable to control who benefits from (consuming) the good (non-excludability in supply); and (ii) consumption of the good by one person does not affect the benefits received in consuming the good by others (non-rivalry in consumption). Non-rivalry in benefits means that the marginal cost of providing the benefit to an additional consumer is zero. Non-excludability in supply means that no one would be willing voluntarily to help supply the good or to pay for using it. Briefly stated, a pure public good conveys benefits that are both non-excludable in supply and non-rival in consumption.²⁶

Examples of goods that possess these properties are the provision of national defense against aggression, the maintenance of social law and order, the redistribution of resources to

²⁴ See Diamond and Dybvig, 1983.

²⁵ Diamond and Rajan, 2003, examine the conditions under which a bank run can, through contagion, create aggregate liquidity shortages.

²⁶ According to Cornes and Sandler (1996, p. 9), nonexcludability is the crucial factor in determining which goods must be publicly provided.

achieve a collectively chosen norm of social justice, and traffic monitoring and enforcement at intersections. Taking the first example, the security of national defense is a non-excludable good: in providing the security of effective national defense against aggression, the government (the supplier) cannot exclude citizens from enjoying the benefits of it and the marginal cost of an additional citizens enjoying the benefit is zero. In fact it is impossible to exclude any citizen from enjoying these benefits: such a good is defined as a *pure* public good. In addition, the fact that one person receives the benefit does not diminish the ability of another citizen to also receive the benefit, and the marginal cost of providing the good does not increase as more individuals reap the benefits. Thus national defense is a good that is non-rival in consumption. Although national security could, in principle, be provided by the private sector, there are incentives to be a *free rider*, which is defined as the reluctance of individuals to contribute voluntarily to the production of a public good.²⁷

Table 3 presents a typography showing how private and public goods differ in the two characteristics of public goods. Note that, even if a good is rival in consumption, it can still be considered as having a public-good character if the benefits it provides are non-excludable. An example is the natural clean air we breathe: it is a *pure* public good, until there is rivalry in its use, as when a company pollutes the air in a community. The company's actions cannot alter the supply of air to the citizens in the community, but its consumption of clean air (i.e., its pollution) reduces the ability of the citizens in the community to consume clean air.

With the development of the joint field of law and economics, a new practical insight emerged: the assignment of property rights can be used to “internalize” (that is, make private) the costs of the negative externality.²⁸ The introduction of property rights, therefore, tends to reduce the need for an outside agent (government) to create the conditions necessary for eliminating or reducing the adverse consequences of an externality. For example, in the clean air example above, if the community was granted property rights over the air in its boundaries, the citizens could collectively produce a private solution by imposing a user fee on the company, or restricting its activities to lower the level of pollution.

²⁷ The free-rider problem arises because a public good can be consumed without paying for it. This originates in the non-excludability characteristic of public goods.

²⁸ Ronald Coase received the Nobel Prize in economics for this insight and his related seminal work. See Coase (1960), for example.

Table 3. Typology of Private and Public Goods in Terms of Characteristics

	Excludable	Non-Excludable ¹
Rivalrous	Pure Private Goods	Impure Public Goods: - private externalities - common-pool resources
Non-Rivalrous ^{2,3} (zero marginal cost of consumption)	Impure Public Goods - local public goods - club goods	Pure Public Goods

¹ According to Sandler (1992), “Benefits of a good, available to all once the good is provided, are called nonexcludable. If the benefits of a good can be withheld costlessly by the owner or provider, then benefits are excludable.

² According to Sandler (1992), “A good is *nonrival* or indivisible when a *unit* of the good can be consumed by one individual without detracting, in the slightest, from the consumption opportunities still available for others from that *same unit*.” For nonrival goods, exclusion is possible (by charging fees or club membership) but undesirable because it results in under consumption; but without exclusion (e.g., without charging for the good), there is the problem of undersupply (because there is no incentive to supply it).

³ Partially rival means one’s consumption of the benefit diminishes the benefits of others but does not eliminate or preclude others from receiving some benefit from consumption—e.g., a crowded park or fishing stream, both of which are nonexcludable.

A pure public good is produced in optimal quantities when the marginal cost of producing an extra unit of that good equals the marginal social benefit from the consumption of one more unit of that good. Public goods can be produced by both private and public sectors.

Public goods create market imperfections because in a completely unregulated market, public goods would be either under consumed or under produced, including not produced at all. Under production occurs because the good would be produced only up to the point that the private marginal cost to the producer would be exactly matched by the private marginal benefit to the producer (which is the portion of the social benefit that the producer is able to internalize by producing). Thus, it is difficult to provide incentives for private individuals to produce public goods in sufficient quantities. Goods that are non-rival in consumption but excludable in supply will be under consumed, but when they are also non-excludable they will be under produced. It is worth noting again that the under-production or under-consumption of a good is defined in terms of the economic efficiency of an equilibrium and not in terms of its stability properties.

As will be discussed in further detail in sub-sections B and C below, both fiat money and finance, respectively, can and should be seen as being associated with significant positive externalities and can also be seen as public goods. This suggests that both private-

collective and public-sector actions could enhance the private and social benefits of finance beyond what market forces alone would attain.

Incomplete information

When counterparts in financial transactions (in formal and informal markets, and in bi-lateral or multi-lateral over-the-counter exchanges) are not well informed, free-market outcomes will tend to allocate resources inefficiently. For example, because of imperfect information about a company within a particular industry, a local bank may under-estimate or over-estimate the risks associated in lending to firms in that industry. Moreover, the industry might be particularly sensitive to macroeconomic conditions in a neighboring town or state, which might be about to experience a boom or a bust. As a result of not having perfect, or even sufficient information on firms and the industry, the bank might tend to take on a sub-optimal amount of risk, either too much or too little. The outcome might be, therefore, that the industry would receive more or less capital than it could reasonably efficiently utilize, and the bank and its depositors would end up owning more or less credit risk than is optimal for the bank and its financial stakeholders.

When information is incomplete, adverse selection and moral hazard can lead to situations in which economically desirable goods are driven out of the market by economically undesirable goods. To see this, consider the classic case of the “market for lemons”: the case of the sale of a used car (or a loan originated years ago by a bank) in which the owner of the used car (loan) knows almost everything about the performance of the car (loan) and the potential buyer next to nothing.²⁹ Because there is a risk of buying a dysfunctional automobile in this secondary market—i.e., of buying a “lemon”—buyers tend to price the risk of a car being a lemon into their offer-prices, which tends to lower prices, even for good cars. The result is that fewer suppliers of cars are willing to sell, especially good cars. This also means that more “lemons” are sold than is beneficial, which further reduces welfare.

In finance, this can be seen by considering an example of adverse selection in the credit derivatives market, which is a market for buying and selling insurance protection against the risk of a default on a loan.³⁰ Adverse selection results from the fact that lenders that issued credits to borrowers that are considered to have a higher risk of default are more likely to want to be insured than those who are lower risks. This encourages the insurer to raise premiums above the socially efficient price, which reduces the overall amount of insurance provided below the social optimum. This can lead to a situation in which low-risk

²⁹ See Akerlof (1970).

³⁰ Adverse selection occurs when two parties in a negotiation have different amounts of information—*asymmetric information*—and the outcome restricts the quality of the good traded. This typically occurs because the party with more information is able to negotiate a favorable exchange.

insurees are priced out of the market, and so there would be a large number of high-risk insurees in the insured pool. In the extreme case, only owners of high-risk credits will be able to obtain insurance, which is highly inefficient. This is as yet an unexamined potential issue in financial stability (which may be developed later in the monograph). A similar situation can occur in credit markets in which riskier borrowers crowd out less-risky borrowers.

One solution to this kind of adverse selection is to monitor. For example, insurance providers—both private and public—have the strong incentive to require inspections. Another solution is to offer co-insurance rather than full insurance. Still another is to insure large groups to capture the diversity of risks. In the extreme, this would mean insuring the entire population of depositors, which would appear to be optimal if it could be properly priced and monitored. But then there is the moral hazard.³¹

Incomplete markets

Market forces often fail to provide a good for which the private cost of producing it is less than what private individuals are willing to pay for it. This type of market imperfection is referred to as incomplete markets. Economists have suggested several reasons for incomplete markets, including: high transactions costs in running markets, enforcing contracts, and introducing new products; asymmetries in information concerning financial risks; enforcement costs on defaulted contracts; and adverse selection. Thus, incomplete markets often are the result of the existence of other market imperfections, such as incomplete information or insufficient competition.

Finance is thought to be an area where this kind of market imperfection is prevalent, particularly regarding loans, insurance contracts, and capital-market instruments. An example in lending and capital markets is the market for college-student loans. In principle, lending to students is no more risky than lending to small- and medium-sized businesses. It can even be argued that lending to college students, whose incomes are likely to be higher than average, would be less risky. Until government guarantee programs were put in place, this market did not develop to offer loans to college students that were willing to pay even market rates for them. Now, many of the major banks have student loan portfolios. A similar analysis can be made in the case of home-mortgage loans: once quasi-government agencies stepped in to under-write them, the market for home mortgages expanded at a faster pace in the United States. Another example is deposit insurance. Even though banks would have been willing to pay for this insurance to keep a steady stream of deposits flowing the market did not provide it until the government stepped in during the Great Depression to provide it.

³¹ Moral hazard is the risk that one party to a contract can change their behavior to the detriment of the other party once the contract has been concluded. It occurs, for example, when an insured agent takes less than the efficient amount of precaution against the insured event. For example, a bank depositor who is fully insured takes no precaution against insolvency of the bank, such as monitoring the ability of the bank assess and manage credit risk.

B. Fiat Money as a Public Good?

In private exchanges, the use of specific units of currency is rival in consumption and so it conveys private benefits. It is rival in consumption because in bilateral or multilateral trades and exchanges, only the parties to the exchanges benefit from the value obtained in them. To the extent that the supply of fiat money is fixed at any point in time, it is also excludable in supply, even though the issuer does not specifically restrict its use to one set of individuals over another.

Going to the next level of generality, the more that people use fiat money in their exchanges, the more efficient multilateral exchange becomes; likewise, the more efficient other economic processes that rely on exchange also become. Once the use of fiat money extends beyond a certain critical social threshold, *the widespread use of fiat money provides positive externalities* to others not necessarily involved in every exchange using specific units of currency. This is because as the universality of use of fiat money grows, there is a greater “pool” of potential transactors and liquidity in using fiat money. In terms of the characteristics of rivalry and excludability, as universality of use expands, the *pool* of transactors and liquidity surrounding the fixed supply of fiat money becomes non-excludable. In the literature on public goods, this is known as a “common-pool resource.” It is similar to a lake or stream in which there is *nonexcludable* access to fish but in which the benefit of consumption of the good (catching fish) is *rival* because once a fish is caught it can no longer be consumed by someone else—unless if there is a catch-and-release policy at the lake or stream.³² This common-pool resource is a non-pure public good, as defined in the upper-right hand corner of Table 3 (rival but nonexcludable goods). Note that fiat money itself is not the public good, in part because the marginal cost of providing it to a growing population is not zero (in the way the marginal cost of another person benefiting from national defense would be): it is the pool of transactors and liquidity that develops because of the existence of fiat money and its characteristics and services.

However, once fiat money reaches the point of *universal acceptability* in providing finality-of-payment services, the positive externality extends to all members of society. In this way, the *services* provided by fiat money are public goods (see Box 2—Samuelson’s Store of Value as a Public Good for an alternative and rigorous justification). In fact, the *universal acceptability* of fiat money as society’s means of payment satisfies the two defining requirements of a pure public good: non-excludability in supply and non-rivalry in

³² See Maier-Rigaud and Apesteguia (2004). They show differences in rivalry for non-excludable good lead to differences in aggregate investment behavior in a neighborhood of the Nash-equilibrium. More specifically, the authors demonstrate that public goods and common-pools are distinct rather than identical Nash-equilibrium games: the former game leads to private investment that is above the Nash-equilibrium level of investments while the latter game leads to private investment above the Nash-equilibrium. However, over time, both games converge to the same Nash-equilibrium. Thus, “aggregate behavior in both games is surprisingly similar in the sense that it starts in the neighborhood of the Pareto optimum and moves to the respective aggregate Nash equilibrium.”

consumption. The first property is satisfied because in a society in which there is a universally accepted means of payments, the fiat issuer cannot exclude anyone from benefiting from one of its most important services, that of universal acceptability. The second is satisfied because the fact that one agent receives the benefit of having access to a universally accepted means of payment does not reduce the ability of others from enjoying the benefits of universal acceptability.³³ Moreover, the universal use of a common means of payment facilitates more efficient multilateral trade and exchange among members of an economy.³⁴

C. Finance and Financial Stability as Public Goods?

As the universally accepted means of payment, fiat money is a public good because it conveys (external) benefits that are non-rival and non-excludable, for example in the way that it facilitates multilateral trade and exchange. Without it, Jevons' "double coincidence of needs" would constrain the efficiency and amount of trade, exchange, and economic activity more generally. Fiat money accomplishes this because it eliminates the need for human trust, and is the economy's surrogate for trust, in trade and exchange.

Finance is an exchange of one service for another with a promise to reverse the exchange: it involves a temporary exchange of fiat money for a promissory note. Within a particular exchange, finance provides rival and excludable benefits to the counterparts of the (bilateral or multilateral) exchange. That is, individual financial transactions are among private individuals and provide private benefits.

As a critical mass of financial activity is reached, finance both provides *positive externalities* and conveys *public goods* as well. The positive externalities are associated with the efficiency gains that finance provides over fiat money in facilitating the more efficient inter-temporal allocation of resources (such as borrowing against future earnings) and in providing greater and more effective opportunities for all members of society to store value and accumulate wealth. In effect, finance enhances (or leverages) the public good function of fiat money: it amplifies the universally accepted finality-or-payment services of fiat money, both spatially and inter-temporally. If the services of fiat money are a public good, then some of the services of finance are also a public good.

Importantly, when the level and effectiveness of finance as a process or system reaches a critical mass, the process (or financial system) itself provides the opportunity for all to have access to effective and superior stores-of-value: *the process that provides these services becomes a public good*. It does so because it begins providing benefits to society

³³ Tobin (1980 and 1992) writes, "Social institutions like fiat money are public goods."

³⁴ Note that these same arguments apply to the unit of account service of fiat money.

Box 2. Samuelson's Store of Value as a "Social Contrivance" Providing a Public Good

Although the public-good nature of fiat money has been well understood—both historically and conceptually—and widely accepted, it was not until the beginning of the post world war II period that there was a rigorous economic-theoretic demonstration that “money” provided public goods. In this context, and as will be explained below, by providing public goods is meant that the introduction of “money” allowed a stylized economy to move to a more beneficial outcome for society as a whole. In the model described below, it is not the introduction of fiat money or “money” as a means of payment that provides the lubrication to move the economy to the best outcome, but instead money as a store of value.

Samuelson's Model

The seminal paper that considered this issue was Paul Samuelson's, “An Exact Consumption Loan Model of Interest With or Without the Social Contrivance of Money.”¹ In that paper, Samuelson considers a model of a highly stylized economy that produces and consumes only a single perishable good, that exists indefinitely into the future, and that has three overlapping generations (OLG) of finite-lived economic actors: the working young, the middle-aged worker facing retirement, and the retired old. In this model, all actors must consume the single perishable good available in the economy in order to survive. Because retired workers no longer received income, they had to find some other way—a *contract* with the young and middle-aged—to obtain the consumption good during their retirement, otherwise they would die after they became unable to produce.

Individuals could, in principle, enter into *private contracts* in order to secure *promises* to receive goods in retirement. But the various equilibria considered in the model turned out to be socially sub-optimal. The equilibria are sub-optimal in the sense that in order to avoid starvation in retirement, *consumption loans* necessary for survival would lose a significant share of their value in one period. That is, in the *consumption-loan* model, the equilibrium interest rate would either be negative if population growth were zero, or fall well short of society's biological growth rate, which would be undesirable from a social point of view. As Samuelson emphasized, “It [the model] points up a fundamental and intrinsic deficiency in a free pricing system, namely, that free pricing gets you on the Pareto-efficiency frontier but by itself has no tendency to get you to positions on the frontier that are ethically optimal in terms of a social welfare function; only by *social collusion*—of tax, expenditure, fiat, or other type—can an ethical observer hope to end up where he wants to be.”

To try to overcome the sub-optimality, Samuelson introduced the “social contrivance of money,” as a “social compact” to achieve the socially optimal Pareto-efficient equilibrium. In Samuelson's words, “The present model enables us to see one ‘function’ of money from a new slant—as a social compact that can provide optimal old age social security.... If each man insists on a quid pro quo, we apparently continue until the end of time, with each worse off than in the social optimum.... Yet how easy it is by a simple change in the rules of the game to get to the optimum. Let mankind enter into a Hobbes-Rousseau social contract in which the young are assured of their retirement subsistence if they will today support the aged, such support to be guaranteed by a draft on the yet-unborn. Then the social optimum can be achieved within one lifetime....”

The social compact introduced is comprised of value-less pieces of paper and the understanding—and more importantly the trust—that they could be used to buy goods *now and forever in the future*. Samuelson's “money” constitutes both a universally acceptable means of payment and, more importantly, a *store of value* of no intrinsic value other than its exchangeability for goods in the future. Young and middle-aged workers accept this paper in return for goods they produce because the social contract would hold for them in retirement as well: all of this by social decree, trust, and acceptance by all present and future generations.

Box 2. continued.

Samuelson proved that the introduction of this social compact—this store of value—moved the economy to the social-optimal Pareto efficient equilibrium. In Samuelson's own words, "Once social coercion or contracting is admitted into the picture, the present problem disappears. The reluctance of the young to give to the old what the old can never themselves directly or indirectly repay is overcome. Yet the young never suffer, since their successors come under the same requirement. Everybody ends better off. It is as simple as that." In effect, the introduction of Samuelson's "money" as a "social contrivance" moved the OLG barter economy to a more Pareto-efficient resource allocation.

'Samuelson's "Social Contrivance" is not Just Money: It is Finance

Within the model, Samuelson's "money" is not just a means of payment. It represents a store of value that facilitates intertemporal transfers of purchasing power and thereby creates both a private and a social-welfare improvement.

This is finance in the sense that it has been discussed above.² The social contract works in the model because it removes the element of human trust between generations, which no doubt accounts for the decline in loan value after the first period. In effect, within the OLG model without the social contract, there is a negative externality that prevents the emergence of the socially optimal outcome. The negative externality is that the economy lacked an important market—a financial market. The retired citizens have no way of establishing a contract with the young that would make the young feel comfortable that they themselves would be repaid. While the model did not explicitly model the frailty of human trust, this is the negative externality. Introducing the "social contrivance of money" as the social compact allowed the young and old to enter into private contracts using a vehicle that allows them to internalize in private transactions the negative externality.

¹ See Paul A. Samuelson (1958). Some authors suggest Allais (1947) considers this as well.

² Cass and Yaari (1966) demonstrate that when durable goods are introduced into Samuelson's framework both government and private *finance* in the form of promissory notes (debt) can, under different conditions, produce the social optimum.

that reach well beyond the aggregation of the benefits private individual transactions, and because they also become both non-rival in consumption and non-excludable in production. Access to the efficiency benefits of a well-functioning financial system is *non-rival* because one person's access to (and consumption of) the benefits of the process does not diminish another's access to the benefits of this system. Indeed, it can be argued that the more everyone accesses these benefits the greater is the benefit to all. Access to the efficiency benefits is *non-excludable* because no one can be excluded from reaping the broader social benefits of finance's contributions to the efficiency of economic processes. Finance provides other positive externalities as well, because it enhances the services of fiat money by facilitating a greater number of transactions than fiat money alone could support. Importantly, it does this inter-temporally.

Just as the introduction of fiat money allows for the separation of the timing of receipt of income from that of expenditures, finance—borrowing and lending—allows individuals to shift purchasing power forward in time. This intertemporal separation allows societies to

achieve a more efficient allocation of resources, greater production from available resources, and in the end greater consumption. These services are public goods and so too is finance.³⁵

Similar externality and public good arguments can be made for preserving financial stability. Everyone would like to see financial stability preserved, because there are both private and public costs associated with bank failures, market dysfunctions, and systemic financial problems. But no one individual or small group of individuals can do much to prevent problems from arising beyond engaging in prudent portfolio and risk management. Moreover, because the private cost of doing something about systemic risk is too high, and the rewards too low, on balance everyone has the incentive to let someone else worry about it. The provision and maintenance of financial stability would provide benefits to all individuals, and the fact that one person incurs these benefits does not prevent others from doing so. Thus the principles of non-excludability and non-rivalry would apply to financial stability as it does to national defense.

D. Market Imperfections in Practice: Some Produce “Too Little of a Good Thing” and Others “Too Much of a Bad Thing”

Some market imperfections in finance can be seen as “positive” in the sense that they do *not* produce private or social “bads.” Instead, the market failure is that private incentives and market forces alone would lead to the under-production and/or under-consumption of financial activities with desirable characteristics and potential private and social benefits. Sources of market imperfections that lead to this kind of outcome are positive externalities, public goods, some forms of incomplete information, incomplete markets, and a lack of competition. A specific example would be the lack of competition in supplying student loans, which would tend to lead to an over-pricing of the risk of lending to students and therefore to an under-supply of loans to this class of borrower. The challenge in these cases is to provide incentives or impetus to supply and consume more of the goods that provide positive externalities and public benefits, that tend to open up new markets, and that increase competition except if there are natural monopolies (See Box 1 Sources of Market Failures in Finance).

The introduction of fiat money in the mid-seventeenth century—which came in to its own in the early part of the twentieth century with the disappearance of commodity monies and standards—may have been the first “socially collective” push to increase the beneficial aspects of financial activity. And the advent of banking, and other financial arrangements, all helped to increase the potential benefits of finance to individuals and society at large. As financial systems continue to evolve, new arrangements are likely to be created, and arrangements already created improved. One aspect of financial-system policies is to ensure

³⁵ Because finance provides both private and public goods, it is reasonable to argue that financial stability should be ensured through a combination of private market-disciplining mechanisms and official, public-sector intervention.

that this process of innovation and evolution continues to raise overall economic efficiency and therefore the public as well as private benefits of finance.

But there is also another side to finance. Some market imperfections in finance can be seen as “negative” in the sense that they lead to outcomes in which private and social “bads” are produced. The market failure in these cases is that private incentives and market forces alone lead to the over-production and/or over-consumption of financial activities that have undesirable characteristics and potential social costs. Sources of these kind of market imperfections include negative externalities, some kinds of information failures, and excessive competition. Here the challenge would be to provide incentives and the impetus to minimize the production and consumption of financial activities that result from these imperfections. A specific example is excess competition in a particular segment of the market for loans, which can lead to under-pricing of the risks (and therefore over-supply of this particular class of loans).

There are many ways to illustrate both sides of market failures in finance. Perhaps the most direct is to consider the characteristics of bank money, the *closest finance substitute for fiat money*. To the extent that bank money—bank notes (or demand deposits) that promise to pay fiat money on demand—provides superior store-of-value services to society at large and also enhances (by literally leveraging) the real economic benefits of the universally accepted means-of-payment services of fiat money, it both conveys *positive externalities* and is a *public good*. But if completely left to market forces, because of the inherent uncertainty about trust, the future, and information, the demand for them would be less than what would be considered to be socially optimal. This is so, because individual private demands for bank deposits would focus exclusively on the private benefits and risks, and not incorporate the external benefits of leveraging the finality-of-payment services of fiat money.

There is also a potential *negative externality* associated with bank deposits, however, similar to those associated with traffic jams. Individuals lend their fiat money to banks in return for a promise to get it back on demand. Meanwhile, banks invest these funds in risky assets, which the banks understands better than the depositors. Thus, these bank notes are risky. If banking was left entirely to market forces, when banks become suspected of mis-managing their assets, individuals have the incentive to withdraw their funds. If a large number of depositors withdrew their funds simultaneously, the bank would quickly run out of liquid funds, become insolvent, and so most individuals would lose their deposits. That is, when left to market forces alone, bank deposits can be subject to “runs” from time to time, as uncertainty about trust ebbs and flows. Knowledge of this would tend to reduce the amount of deposits in the financial system below the economically and socially desirable amount. The introduction of deposit insurance—either privately or publicly funded—would eliminate these sources of market failure and help moderate demand around the social optimal level, provided the deposit insurance scheme was appropriately priced and/or monitored for abuse and moral hazard.

VI. POLICY IMPLICATIONS AND CONCLUSIONS

It is worth repeating that modern finance can be seen primarily as a dynamic network of a large number of individual private financial contracts seeking exclusive private gains. Accordingly, the net social benefits of finance can be seen as the aggregate of individual private net benefits (albeit these are difficult to measure).

However, it would be an illusion to see the effectiveness of private finance and its enormous real economic benefits as either entirely private or exclusively the result of individual private actions and unrestrained market forces. Regardless of what is thought about the necessity and efficacy of public policies, obtaining the full extent of the private net benefits of modern finance requires, as a minimum, the existence and effectiveness of many private-collective, publicly sanctioned, publicly mandated, and taxpayer-financed social conventions and arrangements.

Many of the important social arrangements are taken for granted. For example, modern private financial contracts are predominantly written in terms of the social convention of a legally sanctioned unit of account. This unit-of-account service has the properties of a pure public good and is part of every financial transaction. All receive benefits and none pay a private cost (price), except as taxpayers. The service could be provided and financed privately, but most attempts to do so throughout history have neither succeeded nor endured. A second example is that settlement and delivery of payments for financial transactions typically require and occur in terms of a universally accepted legal tender (a fiat money), which, as argued earlier, also has the characteristics of a public good. Third, there is also the important presumption of legal recourse in the absence of financial contract performance, all of which relies on the effectiveness of a publicly financed and enforced legal system. And, other aspects of social-collective action underlie the effectiveness and efficiency of private finance, not the least of which are well-run and well-supervised financial institutions, effective micro- and macrofinancial-system policies, and effective micro- and macroeconomic policies.³⁶

Although finance would no doubt exist and bestow benefits without these particular social arrangements, there would most likely be significantly less of it, and it would be significantly less efficient and supportive of economic activity, wealth accumulation, growth, and ultimately social prosperity. In short, the enormous and pervasive private benefits of

³⁶ Levine (1999) finds that the legal and regulatory environment of financial intermediaries is positively associated with economic growth. More specifically, Leahy and others (2001) show that the transparency and enforcement of these legal and regulatory frameworks, in particular in terms of investor protection, accounting and auditing requirements, is broadly linked to innovation and investment in new enterprises. Beck, Demirgüç-Kunt, and Levine (2003) establish that countries with better-developed national institutions and policies governing issues such as property rights, the rule of law, and competition are less likely to suffer systemic banking crises.

modern finance and financial systems are as they are because the existence of an effective financial system has long been understood and supported as a public good. This is not meant to imply, however, that all public-policy involvement in private finance is appropriate, beneficial, or acceptable.

Thus, more realistically, although modern finance can be seen primarily as a private affair, the private net benefits originate in two inseparable sources. First, there are the *direct* individual private net benefits derived from private financial transactions. Second, there are the indirect private and collective net benefits associated with (i) having access to an effective process of finance; and (ii) sharing in the enormous collective efficiency gains finance creates for the economic system as a whole. All citizens do not benefit equally or have equal access to these private and social benefits. But the social benefits are there for the taking, especially in the more democratic societies with liberalized economies. As discussed in the paper, some of these benefits can be portrayed as both nonrival in consumption and non-excludable in supply.

Although there now seems to be a consensus that many of the social conventions and arrangements that have developed over time are essential prerequisites for effective finance, this reflects a relatively new and modern understanding of the role of finance. Less than seventy-five years ago, societies' mismanagement of both money and finance played an important and devastating role in the Great Depression.³⁷ More recently, some of these lessons are being learned again, in both mature markets and in an increasing number of emerging- and less-developed-market countries. For example, in the aftermath of recent corporate scandals in some mature markets, improvements are being advocated and implemented in, for example, accounting standards and their enforcement, and the efficacy of existing corporate governance procedures and their accountability. Likewise, as the result of recent financial crises in emerging-market countries, many of these social arrangements are being aggressively advocated for adoption in less advanced, including the least developed, economies and financial systems.

Viewed from the perspective of public-sector economics (and as discussed in Section V), if finance did not entail positive externalities, public goods, and other sources of market imperfections, the best public-policy approach would be to leave finance completely to individual actions and market forces. But, as has been observed, finance inherently embodies uncertainty about trust and several other market imperfections: (i) some financial services provide positive externalities and are therefore underproduced/underconsumed, while others provide negative externalities and are therefore overproduced/overconsumed; (ii) some are public goods and are therefore underproduced/underconsumed; (iii) there are information failures, which can work both ways; (iv) financial markets are incomplete, which leads to underproduction of financial products and services; and (v) competition is not

³⁷ Bordo, 2000 discusses some of the connections between, and historical experience of, unsound money and finance.

always perfectly balanced; when there is not enough of it, goods are underproduced, and when there is too much of it, goods are overproduced.

In practical terms, market imperfections in finance may lead to the under-consumption and underproduction of some socially desirable financial activities, and the overconsumption and overproduction of some socially undesirable ones. This is a more practical motivation for private-collective action and public policy.

In considering collective actions, the overall objective would be to move the economic and financial system toward a more economically efficient and socially optimal level, mix, and allocation of finance, measured in part by the ability of finance to facilitate real economic processes. In this way, collective action in finance could enhance both private and social welfare.

It would seem reasonable to think that private-collective and public actions could be designed and implemented to address each source of market imperfection in finance, depending on how significant the efficiency losses associated with each one might be. In considering this, the effectiveness of policies could be improved if they were designed and implemented in a cohesive fashion so that a policy designed to eliminate the negative impact of one kind of market imperfection does not offset the benefits of a policy designed to deal with another. It is not clear to what extent such policy cohesiveness and coordination is actually achieved in practice by countries or across borders.

When the market imperfection inhibits consumption and production of desirable goods, the challenge would be to provide incentives to supply and consume more of the goods that provide public benefits and positive externalities, tend to open up new markets, and increase competition except if there are natural monopolies. When the market imperfection encourages consumption and production of undesirable goods, the challenge would be to minimize the production and consumption of financial activities that result from these market failures. Because both tendencies exist simultaneously, financial-system policies would be more effective if they strove to strike a socially optimal balance between maximizing the net social benefits of the positive externalities and public goods, and minimizing the net social costs of the other market imperfections in finance. As noted already, this would most likely encompass a combination of both private-collective and public policy involvement that should also be striving to achieve some kind of social optimum. Striving to achieve the social optimum will undoubtedly entail difficult choices, including trading off some of the individual private benefits for the greater good, if and when this can be justified.

The public-policy discussion in Section V deals with the efficiency loss associated with market imperfections. As noted earlier, it is not necessary that each and every loss of efficiency requires intervention. It is much clearer that when a market imperfection in finance leads to an inefficiency that is potentially destabilizing, either for financial institutions or markets, or for both, that some form of collective action might be desirable, if not necessary. Unfortunately, in the financial-system policy literature, it is often the case that no clear

distinction is made between sources of market imperfections that tend to lead to instability and those that do not. Likewise, there does not now exist a framework for either measuring the efficiency losses associated with market imperfections in finance or assessing the risks to financial stability associated with market imperfections. These are some of the challenges in the period ahead for which a policy-oriented analytical framework for financial stability would be useful. But creating this, too, is an enormous challenge.

* * * * *

In all, although it provides tremendous private and also social economic benefits, important aspects of finance are associated with market imperfections and inefficiency. Because of these inefficiencies, aspects of finance inherently entail the potential (though not necessarily a high likelihood) for fragility, instability, systemic risk, and adverse economic consequences. When private incentives and actions alone do not lead to an efficient pricing and allocation of capital and financial risks, it is possible that some combination of private-collective action and public policy could provide incentives to encourage the private sector to obtain a more efficient and desirable outcome.

Whether something can or should be done about this is the subject of active debate but, practically speaking, depends on the social net benefits of doing so. If the private and social benefits of taking action and providing incentives outweigh the private and social costs, then they are worthy of consideration. A rule to consider, but which is difficult to implement, is that only policies that provide clear and measurable net benefits should be implemented.

This calculus most often entails both spatial and intertemporal trade-offs. Although immediate benefits might be associated with specific private-collective or public-sector policies, there may be greater future costs associated with private market reactions and adjustments to the policies. Examples include the costs of moral hazard and regulatory arbitrage.

Ultimately, it is a social and political decision whether private-collective and public-sector involvement and intervention is appropriate. These cost-benefit, intertemporal, and social and political considerations are key reasons why financial-system policies are so difficult to devise and implement successfully.

References

- Acemoglu, D., and F. Zilibotti, 1997, "Was Prometheus Unbound by Chance? Risk, Diversification and Growth", *Journal of Political Economy*, Vol. 105, pp. 709–51.
- Akerlof, George A., 1970, "The Market for 'Lemons': Quality Uncertainty and the Market Mechanism," *Quarterly Journal of Economics* (August), pp. 488–500.
- Allais, Maurice, 1947, *Economie et interet*, 2 Volumes (Paris: Imprimerie Nationale).
- Beck, Torsten, Amir Demirgüç-Kunt, and Ross Levine, 2003, "Bank concentration and crises", *NBER Working Paper* No. 9921 (Cambridge, Massachusetts: National Bureau of Economic Research).
- Bisignano, Joseph, 1998, "Towards an Understanding of the Changing Structure of Financial Intermediation: An Evolutionary Theory of Institutional Survival," *Societe Universitaire Europeenne de Recherches Financieres (SUERF) Studies #4* (Amsterdam).
- Bordo, Michael D., 2000, "Sound Money and Sound Financial Policy," paper prepared for the *Conference, Anna Schwartz—the Policy Influence* (Washington: American Enterprise Institute, April 14).
- Braudel, Fernand, 1977, *Afterthoughts on Material Life and Capitalism* (Baltimore, Maryland: Johns Hopkins University Press).
- Cass, David, and Menahem E. Yaari, 1966, "A Re-Examination of the Pure Consumption Loans Model," *Journal of Political Economy*, Volume 74, pp. 353–367.
- Coase, Ronald, 1960, "The Problem of Social Cost," *Journal of Law and Economics* (October).
- Cornes, Richard, and Todd Sandler, 1996, *The Theory of Externalities, Public Goods, and Club Goods* (Cambridge, England: Cambridge University Press).
- Diamond, Douglas W., and P. Dybvig, 1983, 'Bank Runs, Deposit Insurance and Liquidity', *Journal of Political Economy*, Vol. 91, pp. 401–19.
- Diamond, Douglas W., and Raghuram G. Rajan, 2000, "Liquidity Risk, Liquidity Creation and Financial Fragility: A Theory of Banking," *Journal of Political Economy*, Vol. 109, pp. 287–327 (April).
- , 2003, "Liquidity Shortages and Banking Crises," unpublished (August).

- Diamond, Peter A., 1965, "National Debt in a Neoclassical Growth Model," *The American Economic Review*, Vol. 55, pp. 1126–50.
- Greenwood, Jeremy, and Boyan Jovanovic, 1990, "Financial Development, Growth and the Distribution of Income," *Journal of Political Economy*, Vol. 98, pp. 1076–107.
- Hicks, Sir John, 1935, A Suggestion for Simplifying the Theory of Money, *Economica*.
- , 1967, *Critical Essays on Monetary Theory* (Oxford: Clarendon Press).
- Houben, Aerd, Jan Kakes, and Garry Schinasi, 2004, "Toward a Framework for Safeguarding Financial Stability," IMF Working Paper 04/101 and Forthcoming DNB Occasional Paper (Washington and Amsterdam).
- International Monetary Fund, *International Capital Markets Report*, 1998, Chapter V and Annex V (1999) Annex I (Washington, D.C.).
- , 1999, *International Capital Markets: Developments, Prospects and Key Policy Issues*, World Economic and Financial Surveys (Washington, September).
- , 2000, *International Capital Markets: Developments, Prospects and Key Policy Issues*, World Economic and Financial Surveys (Washington, September).
- , 2002, *Financial Risks, Stability, and Globalization*, Johnson, Omutunde E.G. (ed) (Washington).
- Jevons, W. S., 1871, *The Theory of Political Economy* (reprinted in 1970, London: Penguin).
- Keynes, John Maynard, 1930, *A Treatise on Money*, Vol. I (London: Macmillan, Reprint 1958).
- Kindleberger, Charles, 1993, *A Financial History of Western Europe* (Oxford: Oxford University Press, 2nd edition).
- , 1996, *Manias, Panics and Crashes* (Cambridge: Cambridge University Press, 3rd edition).
- Leahy, Michael., S. Schich, G. Wehinger, F. Pelgrin and T. Thorgeirsson, 2001, "Contributions of Financial Systems to Growth in OECD Countries," *OECD Working Paper*, No. 280, Paris.
- Levine, Ross, 1999, "Law, Finance and Economic Growth," *Journal of Financial Intermediation*, Vol. 8, pp. 8–35.

- , 2003, “More on Finance and Growth: More Finance, More Growth?”, *Review* Vol. 85, No. 4, July/August 2003 (St. Louis: Federal Reserve Bank of St. Louis).
- Maier-Rigaud, Frank P., and Jose Apesteguia, 2004, “The Role of Rivalry: Public Goods versus Common-Pool Resources,” Max Planck Institute for Research on Collective Goods Pre-print 2004/2.
- Olson, Mancur, 1965, *The Logic of Collective Action* (Cambridge, Massachusetts: Harvard University Press).
- Padoa-Schioppa, Tommaso, 2003, “Central Banks and Financial Stability: Exploring the Land in Between,” in *The Transformation of the European Financial System*, eds. Vitor Gaspar, et al (Frankfurt: European Central Bank), pp. 269–310.
- Rajan, Raghuram G., and Luigi Zingales, 2003, *Saving Capitalism from the Capitalists* (New York: Crown Business).
- Samuelson, Paul A., 1958, “An Exact Consumption-Loan Model of Interest With or Without the Social Contrivance of Money,” *Journal of Political Economy*, Vol. 6, pp. 467–82.
- Sandler, Todd, 1992, *Collective Action: Theory and Applications* (Ann Arbor: The University of Michigan Press).
- Schinasi, Garry J., 2003, “Responsibility of Central Banks for Stability in Financial Markets,” IMF Working Paper 03/121 (Washington: International Monetary Fund, June); also published as Chapter 17 in *Current Developments in Monetary and Financial Law—Volume 2* (Washington: International Monetary Fund, October 20).
- , 2004, “Defining Financial Stability,” IMF Working Paper, Forthcoming (Washington, D.C.).
- , Sean Craig, Burkhard Drees, and Charles Kramer, 2000, *Modern Banking and OTC Derivatives Markets: The Transformation of Global Finance and its Implications for Systemic Risk*, IMF Occasional Paper No.203 (Washington: International Monetary Fund).
- Shubik, Martin, 1999, *Theory of Money and Financial Institutions* (Cambridge, Massachusetts: MIT Press).
- , 2000, “The Theory of Money,” unpublished (April).
- Stiglitz, Joseph E., 2000, *Economics of the Public Sector* (New York: W. W. Norton).

Tobin, James, 1980, "Discussion by James Tobin," in J.Kareken, and Neil Wallace, eds., 1980, *Models of Monetary Economics* (Minneapolis: Federal Reserve Bank of Minneapolis).

———, 1992, "Money as a Social Institution and Public Good," *The New Palgrave Dictionary of Money and Finance*, eds. J. Eatwell, M. Milgate, and P. Newman, (London: Macmillan).

World Bank, 1999, "Processing the Economy's Financial Information," Chapter 6 in *World Development Report 1998–99* (Washington).