

The Growth of Finance

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Abstract

The U.S. financial services industry grew from 4.9% of GDP in 1980 to 7.9% of GDP in 2007. A sizeable portion of the growth can be explained by rising asset management fees, which in turn were driven by increases in the valuation of tradable assets, particularly equity. Another important factor was growth in fees associated with an expansion in household credit, particularly fees associated with residential mortgages. This expansion was fueled by the development of non-bank credit intermediation (or “shadow banking”). We offer a preliminary assessment of whether the growth of active asset management, household credit, and shadow banking – the main areas of growth in the financial sector – has been socially beneficial.

During the last 30 years, the financial services sector has grown enormously. This growth is apparent whether one measures the financial sector by its share of GDP, by the quantity of financial assets, by employment, or by average wages.

At its peak in 2006, the financial services sector contributed 8.3 percent to U.S. GDP, compared to 4.9 percent in 1980 and 2.8 percent in 1950. The contribution to GDP is measured by the U.S. Bureau of Economic Analysis (BEA) as value-added, which can be calculated either as financial sector revenues minus non-wage inputs, or equivalently as profits plus compensation. Figure 1, following Philippon (2012) and constructed from a variety of historical sources, shows that the financial sector share of GDP increased at a faster rate since 1980 (13 basis points of GDP per annum) than it did in the prior 30 years (7 basis points of GDP per annum). The growth of financial services since 1980 accounted for more than a quarter of the growth of the services sector as a whole. Figure 1 shows that the securities and credit intermediation sub-sectors of finance are responsible for the acceleration of financial sector growth since 1980; insurance, by contrast, has grown at a steady pace since the 1940s.¹

The growth of the financial sector is also evident in the growth of financial claims and contracts, including stocks, bonds, derivatives, and mutual fund shares. Drawing on the Flow of Funds Accounts published by the Federal Reserve, the value of total financial assets was approximately five times U.S. GDP in 1980; by 2007, this ratio had doubled. Over the same period, the ratio of financial assets to tangible assets (like plant and equipment, land, and residential structures) increased as well. This growth was not simply the continuation of a trend that started in the 1950s; rather, something appears to have changed in the early 1980s.

¹ Appendix Table 1, which is available with this article at <http://e-jep.org>, covers the period 1980-2007 and is based on the national income account published by the BEA. It shows the contribution to GDP of the industries comprising the financial services sector: securities, credit intermediation, and insurance. Details on all data sources and calculations are provided in the Appendix.

The U.S. economy was not the only one to experience dramatic growth in financial services. Other than the relatively small economy of Switzerland, where financial services play an outsized role, there is a group of English-speaking countries including the United States, Great Britain, and Canada that stand out for the share of their economy devoted to finance.

Workers in the financial sector have shared impressively in this growth: in 1980, the typical financial services employee earned about the same wages as his counterpart in other industries; by 2006, employees in financial services earned an average of 70 percent more (Phillipon and Reshef 2009). Attracted by high wages, graduates of elite universities flocked into the industry. In 2008, 28 percent of Harvard College graduates went into financial services, compared to only 6 percent between 1969 and 1973 (Goldin and Katz 2008). Graduates from the Stanford MBA program who entered financial services during the 1990s earned more than three times the wages of their classmates who entered other industries (Oyer 2008).

Has society benefited from the recent growth of the financial sector? There is a large literature dating back at least to Schumpeter (1911) that sees a vibrant financial sector as critical to capital allocation and economic growth. Seminal empirical contributions include Goldsmith (1969), King and Levine (1993) and Rajan and Zingales (1998), which document the relationship between financial development and growth in cross-country studies. It is natural to think therefore that the more recent period of financial development has also been economically beneficial. Yet, many are skeptical about its value particularly in light of the recent financial crisis. Indeed, Raghuram Rajan, whose research has emphasized the value of financial development, famously called into question the value of more recent financial sector growth at a symposium of central bankers just before the financial crisis erupted (Rajan, 2005). And Adair Turner, the top financial regulator in the U.K., has written that “There is no clear evidence that the growth in the scale and complexity of the financial system in the rich developed world over

the last 20 to 30 years has driven increased growth or stability, and it is possible for financial activity to extract rents from the real economy rather than to deliver economic value” (Turner, 2010). And Philippon (2012) argues that the period of recent growth has come with a puzzling increase in the cost of financial intermediation.

In this paper, we try to shed light on these competing perspectives by first documenting the ways in which finance changed during the period from 1980 – 2007. We take this approach because surprisingly little is known about which activities contributed to the rapid growth of the financial sector. With a better understanding of how the financial sector changed, we provide some perspectives on the social benefits and costs of financial sector growth.

Our main finding is that much of the growth of finance is associated with two activities: asset management and the provision of household credit. The value of financial assets under professional management grew dramatically, with the total fees charged to manage these assets growing at approximately the same pace. A large part of this growth came from the increase in the value of financial assets, which was itself driven largely by an increase in stock market valuations (such as the price/earnings multiples). There was also enormous growth in household credit, from 48 percent of GDP in 1980 to 99 percent in 2007. Most of this growth was in residential mortgages. Consumer debt (auto, credit card, and student loans) also grew, and a significant fraction of mortgage debt took the form of home equity lines used to fund consumption (Mian and Sufi 2011). The increase in household credit contributed to the growth of the financial sector mainly through fees on loan origination, underwriting of asset backed securities, trading and management of fixed income products, and derivatives trading.

Thus, any assessment of whether and in what ways society benefited from the growth of the financial sector depends in large part on an evaluation of professional asset management and the increase in household credit. In our view, professional asset management facilitated an

increase in financial market participation and diversification, which likely lowered the cost of capital to corporations. This was particularly beneficial for young firms, both because they are more reliant on external financing and because their value depends more on the cost of capital. At the same time, the cost of active asset management has been persistently high. While this encourages more active asset management, it may not result in the kind of active asset management that leads to more informative securities prices or better monitoring of management. It also generates economic rents that draw more resources to the industry than is socially desirable, including human capital.

While greater access to credit has arguably improved the ability of households to smooth consumption, it has also made it easier for many households to overinvest in housing and consume in excess of sustainable levels. This increase in credit was facilitated by the growth of “shadow banking,” whereby many different types of non-bank financial entities performed some of the essential functions of traditional banking but in a less stable way. The financial crisis that erupted late in 2007 and proved so costly to the economy was largely a crisis in shadow banking.

To develop these points we follow the U.S. Bureau of Economic Analysis in breaking out the financial services sector into two sub-sectors: “securities” and “credit intermediation.” We do not consider insurance, the other main sub-sector of financial services, because its steady growth is less of a puzzle.² The securities sub-sector (or “industry” in the terminology of the BEA) includes the activities typically associated with investment banks (such as Goldman Sachs) and asset management firms (such as Fidelity). These activities include securities trading and market making, securities underwriting, and asset management for individual and institutional

²Changes in the value added of insurance since 1980 have been driven mainly by a slight decline in life insurance revenues as a percentage of GDP, and increases in property and casualty insurance and private health insurance. Property and casualty insurance tends to grow mechanically with the stock of tangible assets, as households insure more automobiles and larger and more expensive houses. The growth of private health insurance, while important for many reasons, is driven by causes outside the scope of this article.

investors. The credit intermediation industry performs the activities typically associated with traditional banking – lending to consumers and corporations, deposit taking, and processing financial transactions. After describing what drove the growth of these industries over the course of the 1980-2007 period, we evaluate the benefits and costs of this growth.

The Growth of the Securities Industry

Components of Growth

Figure 1 shows that the growth of the securities industry accounts for almost half the overall (3 percentage point) growth of the financial sector relative to GDP from 1980 - 2007. In particular, the securities industry grew from 0.4 percent of GDP in 1980 to 1.7 percent of GDP in 2007, having peaked at 2.0 percent of GDP in 2001 during the Internet boom.

To get a better sense of the components of growth within the securities industry, ideally we would break out value added by activity. Unfortunately, there are no published data on the input costs at the activity-level needed to calculate value added. Instead, we use data on the output of the various activities of the securities industry. This output measure, calculated by the BEA for 1997 and 2002 and the U.S. Census Bureau for 2007, is essentially the revenues of each of the activities of the industry. Detailed breakdowns are only available in these years. Later in this section we will discuss our own estimates of activity-level outputs for the complete 1980-2007 period. For the remainder of the paper we focus primarily on industry output rather than value added.

As Table 1 shows, in 2007, securities industry output was \$676.1 billion, while value added was \$241.2 billion. Asset management was by far the largest component of output, totaling \$341.9 billion, well over four times its level in 1997. What we call asset management

output includes fees from investment advisory and management (the largest component); the administration of mutual and pension funds; and trust and custody services.

Table 1 shows that three revenue sources traditionally associated with investment banking – trading fees and commissions, trading gains, and securities underwriting fees – fell as a percentage of GDP between 1997 and 2007. These declines occurred despite a fourfold increase in stock-market trading. At the same time, two other activities grew substantially: market-making in fixed income products, with 2007 output of \$35 billion, and derivatives trading with output of \$45 billion. Most of the revenues from derivatives trading appear to be associated with fixed income products, and as such, can be understood as a by-product of the growth of credit intermediation, which we discuss in the next section.³ In 1997, the derivatives category was not even reported, suggesting that it was not significant enough to warrant its own category.

Panning back to 1980

Because the BEA does not provide detailed activity-level data prior to 1997, we use a variety of sources to break out securities industry output back to 1980. Figure 2 shows annual estimates of the revenues from several key activities: traditional asset management (mutual funds, pension funds, and exchange-traded funds), alternative asset management (hedge funds, private equity, and venture capital), and a variety of broker-dealer activities (underwriting, customer trading, and proprietary trading). Although our estimates are imperfect and these categories do not correspond exactly to the product line outputs shown in Table 1, Figure 2 shows that we match the time-series of securities industry output reasonably well.

³ <http://www.goldmansachs.com/media-relations/comments-and-responses/archive/response-to-fcic-older/estimated-derivatives.pdf>.

Fees earned from traditional asset management along with administration costs of pension funds are the largest component of output for the securities industry and are generally an increasing share of output until 1998. We estimate total fees using assets under management reported by the Investment Company Institute (ICI) and percentage fees reported by French (2008) and ICI. The largest component of fees from traditional asset management comes from mutual funds (including money market mutual funds), which grew assets under management from \$134 billion in 1980 to over \$12 trillion in 2007. Fees on equity mutual funds dropped steadily during this period, from over 2 percent of assets to approximately 1 percent of assets, a decline largely driven by less use of mutual funds with up-front fees (“loads”). Absent the drop in loads, the average expense ratio would have risen slightly during this time, despite the increasing availability of low-fee index funds such as the Vanguard S&P 500 mutual fund. Because percentage fees dropped slowly, total fees in each year were largely driven by the value of assets under management. For example, total fees fell in 2001 with the bursting of the Internet bubble, rose to hit their prior peak in 2004, and continued to grow thereafter. Overall, despite year-to-year fluctuations, there was enormous growth in fees from traditional asset management between 1980 and 2007.

The fees collected by alternative asset managers – hedge funds, private equity funds, and venture capital funds – also rose substantially over this period. Most of these funds charge a management fee of 1.5-2.5 percent of assets under management, plus “carried interest,” a percentage of realized gains in the range of 15-25 percent. In most years, the combination of the management fee and carried interest is between 3 and 5 percent of assets under management, considerably higher than the fees charged by mutual funds. To compute aggregate fees collected by hedge funds we apply percentage fees reported in French (2008) to the complete universe of US hedge funds, as reported by Hedge Fund Research. For private equity and venture capital, we

use total fees reported by Kaplan and Rauh (2010), which we update to 2007 using data on assets under management provided by Thomson Financial.

Hedge fund, private equity, and venture capital fees were all near-zero in 1990 because assets under management were low. However, by 2007, approximately \$854 billion of assets was managed by private equity firms, \$258 billion by venture capital firms, and another \$1.46 trillion by U.S.-domiciled hedge funds. Hedge fund fees peaked at \$69 billion in 2007. Fees for private equity and hedge funds were more volatile, spiking in 1999 at \$66 billion, driven by a record number of exits in both private equity and venture capital. In 2007, private equity fees were \$26 billion and venture capital fees were \$14 billion. Together, fees for these alternative investments are comparable to the \$91 billion that was collected by mutual fund managers, who managed more than five times as many assets.

Our estimates of asset management fees are conservative because we do not capture growth in fees charged by investment advisors (although these are included in the data shown in Table 1). These services introduce another layer of fees on top of the management fees that go to traditional and alternative investment managers. We estimate that these advisors collect at least another \$30-\$40 billion of revenues not reflected in Figure 2.⁴ Including these fees helps bridge the gap between the combined total of estimated management fees across investment vehicles (from hedge funds, mutual funds, and so on) and the revenue numbers for asset management reported by the BEA in 2007.

⁴ Historically, investment advisors charged commissions based on the number of trades they execute on behalf of their clients. However, a large number of advisors now mainly charge fees based on assets under management. For example, the U.S. division of UBS Wealth Management reported income of \$6.1 billion on end-of-year assets under management of \$764 billion, implying a fee of 0.79 percent. In 2007, the total assets under management of investment advisors was approximately \$3.6 trillion, suggesting another \$30-\$40 billion of revenues not reflected in Figure 4.

Combining the fees paid to traditional and alternative asset managers, the average fee has fluctuated between 1.1% and 1.6% of assets under management, with the exception of 1999, when venture capital exits took the average fee to 2.3%. In 2007, fees were 1.3 percent of assets under management. In short, although the composition of asset managers has changed over time—with high fee alternative asset managers gaining market share—the average fee paid to the industry per dollar of assets under management has not declined. This is the same conclusion reached by French (2009). Our estimates for total fees are higher than those reported by French (2009), however, because we also include fees earned by U.S. asset managers for assets other than US-listed stocks.

All told, during the 1980-2007 period total asset management fees grew by 2.2 percentage points of GDP, which is over one third of the growth in financial sector output. By contrast, drawing on data broker-dealers file with the Securities and Exchange Commission, Figure 2 shows that the other main activities of the securities industry – underwriting, equity market making, customer trading, and proprietary trading – do not appear to explain a significant share of growth in the securities industry and the financial sector.⁵ However, these filings do reveal significant growth in a catchall miscellaneous category, “other,” which showed large growth during the period. Based on the BEA and Census Bureau data in Table 1 it is reasonable to infer that the growth of this category is related to other unmeasured asset management fees (perhaps advisory fees as described directly above), as well as growth in fixed-income market-making and derivatives trading.

Since asset management fees as a percentage of assets did not fluctuate by much, what then explains the growth in these fees relative to GDP? This growth was driven by two factors:

⁵ These filings are Financial and Operational Combined Uniform Single reports (commonly referred to as FOCUS reports).

increases in the total outstanding amount of financial assets, and increases in the share of these assets that were professionally managed. We describe each of these changes below.

The two bottom series in Figure 3 show the value of traded equity and fixed income securities over time (both scaled by GDP). Taken together, these assets increased from 107 percent of GDP in 1980 to 323 percent of GDP by 2007. The figure shows that securities industry output (dashed line) closely tracks the total value of these assets.

In fixed income, much of the growth came from securitization, whereby assets that were once held as illiquid loans on bank balance sheets were pooled into securities that could be traded and managed by professional investors. Fixed income securities grew from 57 percent of GDP in 1980 to 182 percent of GDP in 2007; approximately 58 percentage points of this growth came from securitization.⁶

In equities, much of the growth came from an increase in valuation ratios. Figure 3 shows that the value of publicly traded equity relative to GDP tracks the price-to-book ratio of the S&P 500. Market capitalization of equities nearly tripled as a share of GDP between 1980 and 2007, growing from 50 percent to 141 percent of GDP. At the same time, the market-to-book ratio of the S&P 500 grew from 1.04 to 2.77, almost entirely explaining the growth. By contrast, the *book value* of equity of publicly-traded firms normalized by GDP was essentially flat during the same period.

In addition to increases in the amount of financial assets, the share of these assets under professional management has also increased. According to the Flow of Funds data from the

⁶ While fixed income assets increased dramatically, outside of hedge fund vehicles, the fees for managing fixed income assets are much lower than for equities, and thus did not contribute much to the overall growth of asset management fees. Data provided to us by Greenwich Associates suggest that actively managed fixed income charged fees of 30 basis points in 2008, compared to 55 basis points active management of domestic equities and 66 basis points for international equities.

Federal Reserve, 53 percent of household equity holdings were professionally managed in 2007, compared with only 25 percent in 1980. Lewellen (2011) reports that from 1980 to 2007, the share of US common stocks that were held by institutional investors increased from 32 percent to 68 percent of aggregate market capitalization. We do not have comparable statistics for the broader universe of fixed income assets, but the Flow of Funds suggest similar increases in the share of these assets that were professionally managed.⁷

Evaluation of the Growth of Professional Asset Management

The direct cost of professional asset management, at 1.3% of assets, is high. The present value of this fee paid over thirty years amounts to approximately one third of the assets initially invested, a large price to pay a manager who does not outperform passive benchmarks. Moreover, paying managers as a percentage of assets under management rewards them when overall asset values rise – even if the manager does not outperform.⁸ Indeed, as shown above, asset management fees during the 1980-2007 period rose in large part because valuation ratios increased.

Has society benefited from the growth of professional asset management despite these high fees? In the standard competitive model, the growth of an industry would seem to imply increased value to consumers and to society. But in the case of asset management, this implication does not follow immediately because of two important deviations from the competitive benchmark. The first deviation is that most of the potential benefits (and some of

⁷ For example, direct household holdings of U.S. Treasury bonds fell during this period from 14 percent of outstanding bonds to less than 1 percent.

⁸ An influential argument by Berk and Green (2004) might be interpreted as rationalizing the payment fees as a percentage of assets. They suggest that active asset managers have the ability to outperform, but that this ability is scarce and increasingly difficult to achieve when a manager invests a larger portfolio of assets. Because the ability to outperform is scarce, in a competitive equilibrium, larger asset pools should pay higher dollar fees because they use up managers' outperformance ability. But this theory does not square with the facts. Active mutual fund managers underperform passive benchmarks even before netting out fees (Fama and French 2010).

the costs) of professional asset management do not accrue directly to users. The second deviation is that many users have trouble assessing the quality and cost of professional asset management services or are influenced by agency considerations in choosing and compensating asset managers.

There are two related direct benefits of professional asset management: household participation in financial markets and diversification. Mutual funds, for example, enable individuals to buy a basket of securities in one transaction rather than construct a portfolio of securities through multiple transactions. Employer-based retirement plans also make it easier to participate and diversify. And, as Gennaoli, Shleifer and Vishny (2012) point out, professional asset management facilitates participation to the extent that excessively risk-averse individuals trust professional asset managers (rightly or wrongly) to invest their money wisely.

According to modern finance theory, participation and diversification bring significant direct benefits to households. Participating in financial markets enables individuals to save and to earn a premium from holding risky assets—a premium that has historically been very high (Mehra and Prescott, 1985). Diversifying enables individuals to more efficiently bear financial risk.

There is evidence that professional asset management has indeed increased household participation. During the 1980 – 2007 period of growth in asset management, the share of household financial assets held in marketable securities or mutual funds grew from 45 percent to 66 percent. According to the Survey of Consumer Finances, the percentage of households that owned stock increased from 32 percent in 1989 to 51 percent in 2007. There is also evidence that households increasingly diversified their portfolios. For example, holdings of foreign equities rose from 2 percent of U.S. residents' portfolios in 1980 to 27.2 percent in 2007 (French, 2008).

In theory, there is a positive externality from an increase in participation and diversification. Increasing households' willingness and capacity to take market risk should reduce investors' overall required rates of return. It is therefore possible—but hard to verify—that the growth of professional asset management was indirectly responsible for the large increase in stock market valuation ratios between 1980 and 2007 (Heaton and Lucas, 1999, Fama and French 2002). This, in turn, may have led to a decline in the cost of capital to corporations. The greatest beneficiaries would have been young, entrepreneurial firms – those most dependent on equity financing and whose values depend more on the cost of capital because of their more distant cash flows. Consistent with this interpretation, Fama and French (2003) show that young firms list their equity on the stock market at an increasing pace after 1979. The enhanced ability of young firms to go public could also help explain the growth of venture-capital backed entrepreneurship after 1980.

Much of professional asset management, however, is not explicitly directed at participation and diversification but rather at beating the market—that is, earning excess risk-adjusted returns or “alpha.” Here the evidence on mutual fund performance strongly indicates that such active management is not directly beneficial to investors on average. Most studies document that active investment managers underperform, especially after taking into account fees. Fama and French (2010) show that mutual funds underperform passive benchmarks, even before taking out fees. Ibbotson, Chen, and Zhu (2010) suggest that hedge funds have produced modest alpha for their investors but Jurek and Stafford (2012) point out that there is no alpha once returns are properly adjusted for risk. Of course, in the aggregate, there can be no outperformance, since one investor's gain must be another's loss. Thus, beating the market is not a direct social benefit of professional management.

However, from a social benefit perspective, the critical question is not whether active management leads investors to earn excess returns—it does not. Rather what matters is whether the *pursuit* of excess returns produces social benefits. One such benefit is more accurate (“efficient”) securities prices, which enable firms to raise new capital at prices that better reflect their fundamental value. If prices are closer to fundamental value, firms have greater incentives to invest in the most productive projects, and to choose the appropriate scale of investment, thereby improving the economy’s overall allocation of capital. One area in which information is particularly valuable is in the funding of start-up firms, where uncertainty and information asymmetries are large. Active asset managers – particularly venture capital firms, private equity firms and hedge funds (and to a lesser extent mutual funds) – can also play an role in monitoring management to make sure that they are taking actions consistent with shareholder value maximization. Indeed, when venture capital firms fund new investments they typically have significant control over the firm, as do private equity investors involved in leveraged buyouts (Gompers 1995; Kaplan and Stromberg, 2003). Hedge funds often pressure the boards of public companies to change corporate policies (Brav, Jiang, Partnoy, and Thomas 2008; Greenwood and Schor 2009), although there is some debate about whether such pressure actually enhances economic value.

Although it may be *socially* beneficial for active managers to acquire information and monitor firms, it is puzzling that they are able to attract funds despite their underperformance. There are few satisfying answers to explain why. The two most promising explanations stem from a lack of sophistication among households, and agency problems at pension funds and other institutional investors. In the case of households, there is evidence that many households do not understand the financial products they buy (Capon, Fitzimons and Prince 1996; Alexander, Jones and Nigro 1998) or their costs (Choi, Laibson and Madrian, 2006). As a result, such households

also probably do not understand that it is hard to identify managers who can consistently generate risk-adjusted excess returns. Gennaioli, Shleifer, and Vishny (2012) suggest that trust is at least as important for manager selection as the desire for outperformance.

In the case of institutions, pension fund and endowment managers are more sophisticated than households, and some of these institutions have been able to earn high returns through their use of high fee alternative managers (Swensen 2000). However, agency problems appear to have led the vast majority of institutions to overpay for active management. Lakonishok, Shleifer, and Vishny (1992) show that institutional managers underperform the S&P 500 index by 2.6 percentage points per year, which they attribute to agency problems.⁹ Goyal and Wahal (2008) show that investment management firms hired by pension plan sponsors typically underperform when compared to investment management firms that were recently terminated by the same sponsors. Novy-Marx and Rauh (2009) point out that public pension funds have incentives to invest in riskier asset classes because this enables them to report higher return forecasts and thereby discount reported liabilities at a higher rate. And many institutions seek advice from banks and investment advisors, which typically recommend private equity investments that subsequently underperform (Lerner, Schoar, and Wongsunwai 2007).

One could argue that the behavior of unsophisticated and agency-prone investors generates a positive externality: there are surely more resources spent gathering information and monitoring managers than there would be in a world in which investors refused to overpay for active asset management. Absent investors' willingness to overpay, equilibrium securities prices could have less than the socially efficient amount of information, and corporate managers would

⁹ One of the main agency problems pointed out by Lakonishok, Shleifer, and Vishny (1992), is that the Treasurer's office prefers active management, because these managers need to be monitored and selected, and thus it helps support the perceived need to have a Treasurer's office in the first place.

be subject to insufficient monitoring. For example, venture capital funding of start-up firms, which has arguably brought significant positive externalities, would have been less robust if investors in venture capital funds had required adequate compensation for the risks they were taking.

While one could make this sort of argument, it is not entirely convincing. One important reason is that not all information collection performed by active asset managers is socially valuable. For example, a hedge fund may be willing to pay \$20,000 to form a more accurate prediction of a company's earnings to be released in the next week. To the extent that this information allows the hedge fund to profit at the expense of other less informed market participants, the fund earns an excess return. Hirshleifer (1971) calls information of this type "foreknowledge," but explains that it has no social value. In other words, the \$20,000 expenditure is a social loss because getting this information into prices one week earlier is unlikely to lead to a more efficient allocation of real resources. Modern financial markets are rife with examples of such socially wasteful investments.¹⁰ These investments lend support to Paul Samuelson's view, originally cited in Shiller (2001, p. 243), that modern financial markets display "considerable micro efficiency" – perhaps facilitated by active asset management – while at the same time retaining large "macro inefficiency." We find it noteworthy that over the last 15 years, despite increased resources devoted to asset management, there have been two large and socially costly valuation errors – the Internet bubble at the end of the 1990s and the overvaluation of mortgage-backed securities during the 2000s.

Another reason to question the social benefits of information production by active managers is the evidence that they cater to the preferences of unsophisticated investors. For

¹⁰ Consider for example, "co-location hosting services," which enable electronic orders to arrive milliseconds faster because of their geographical proximity to trading centers.

example, mutual fund managers channel investor flows into the sorts of securities that investors want to own (say, Internet stocks at certain times, high-yield bonds at other times, and so on) rather than allocating capital to its best use (Frazzini and Lamont 2008). Gennaioli, Shleifer, and Vishny (2012) suggest that investment managers cater to unsophisticated investors' preferences to earn their trust. But even if investors are sophisticated, investment managers may not trade on their own information due to career concerns (Scharfstein and Stein, 1990; Chevalier and Ellison 1997). Thus, we think there is good reason to question whether the marginal dollar of active management makes securities prices more informative. Indeed, Bai, Philippon, and Savov (2012) present evidence suggesting that securities prices have not become more informative since the 1960s.

Finally, when investors overpay for active management, it creates rents in the sector. These rents lure talented individuals away from potentially more productive sectors (Baumol, 1990; Murphy, Shleifer and Vishny, 1991).¹¹ Indeed, during the period of rapid growth in asset management, finance attracted more talent, at least as measured by the number of students entering finance from elite universities. The cost of this reallocation of talent depends, in large measure, on the industries top students would have otherwise entered and the marginal value of additional talent entering finance. If, for example, students shifted into finance from science and engineering, where rents are low and marginal productivity potentially higher, then the talent reallocation is costly to society. By contrast, the social costs are much lower if the marginal entrant into finance would have otherwise sought a career in other rent-seeking sectors, such as

¹¹Murphy, Shleifer, and Vishny (1991) argue that talent flows to large markets, where there are weakly diminishing returns, and talent is measurable and contractible. These are all features of asset management.

law. In a recent study of MIT undergraduates, Shu (2013) shows that finance attracts the best students, as measured by their characteristics at the time of admission.¹²

The Growth of Credit Intermediation

Components of Growth

As illustrated in Figure 1, the credit intermediation industry (as defined by the BEA) grew on a value-added basis from 2.6 percent of GDP in 1980 to 3.4 percent in 2007, having peaked at 4.1 percent of GDP in 2003. The growth of credit intermediation accounted for roughly one-quarter of the growth in the financial sector – less than the contribution of the securities industry to financial sector growth and about equal to that of the insurance industry.

As with the securities industry, we examine in more detail the activities that drove the growth of credit intermediation. Again due to data limitations, we look at the output of these activities rather than their value-added. Table 2, using data from the BEA and Economic Census, breaks out credit intermediation into its main components: *traditional banking* (lending and deposit-taking) and *transactional services* related to credit card accounts, deposit accounts, ATM usage, and loan origination. The distinction between these broad categories is admittedly imprecise.

The output from transactional services is simply the fees collected for these services. Measuring the output from traditional banking – which is divided into lending and deposit-taking – is more complex. The output from lending is imputed as the difference between the interest earned on bank loans (that is, loans on bank balance sheets including commercial, consumer and

¹² Shu (2013) also shows that based on GPA on graduation, the highest achieving students go on to graduate school in science and engineering. This is consistent with finance-oriented students investing less in their coursework, despite their ex ante ability.

real-estate loans) and the interest that would have been earned, had the funds been invested in Treasury and Agency securities (those guaranteed by government agencies such as the Federal Housing Administration or government-sponsored enterprises such as Fannie Mae). These calculations use the average interest rate earned on banks' holdings of these securities: that is, $\text{Lending Output} = \text{Bank Loans} \times (\text{Interest Rate on Loans} - \text{Interest Rate on Treasury and Agency Securities})$. This is meant to capture the ongoing services provided by banks in managing and monitoring loans on their balance sheets, as well as the value of identifying the loans in the first place. However, this basic measure could overstate or understate the value of these services. It overstates the value to the extent that it also includes the credit risk and maturity premium that banks (or any other investors) earn by holding risky long-term loans (Ashcraft and Steindel 2008). The measure could understate the value of these services to the extent that the fees associated with loan origination are included in our transactional services category.

The imputed output from deposit-taking is measured as the quantity of deposits multiplied by the difference between the rate earned on Treasury and Agency securities and the rate paid on those deposits; that is, $\text{Deposit Services Output} = \text{Deposits} \times (\text{Treasury Interest Rate} - \text{Average Interest Rate Paid to Depositors})$. Depositors presumably accept yields below those of U.S. Treasuries and equivalent government guaranteed securities because they use deposits for transactional purposes.

Table 2 shows that the output from traditional banking as a percentage of GDP was roughly the same in 2007 as it was in 1997. Where there was substantial growth was in transactional services, largely reflected in fees associated with deposits, residential loan origination, and the catchall category of "other products supporting financial services." In 2002, in particular, there was a spike in residential loan origination fees as part of the largest mortgage-

refinancing wave in U.S history. These fees totaled \$76.8 billion—0.7 percent of GDP, or 2.7 percent of the \$2.85 trillion of residential mortgages issued in that year.

As in the previous section, we form our own estimates of the sector’s outputs going back to 1980. Here, we follow the methodology of the BEA and use data from the Call Reports, which all regulated financial institutions must submit to the Federal Deposit Insurance Corporation at the end of each quarter. As a consistency check, we verify that we can replicate the total output numbers in the years in which the Economic Census is carried out (that is, every five years starting in 1982).¹³

As can be seen from Figure 4, imputed output from lending as a share of GDP has fluctuated around its mean of 1.2 percent of GDP. Much of the variation comes from changes in the ratio of bank loans to GDP, which fell from about 60 percent at the end of the 1980s to under 50 percent at the end of 1990s. During the housing boom in the 2000-2006 period, bank loans rose back to about 60 percent of GDP.

Figure 4 also shows that output from deposit-taking has generally been falling over time. Some of the decline stems from reductions in spreads between securities and deposits, but the main source of the decline is a reduction in deposits relative to GDP – from its peak of about 70 percent at the beginning of the 1980s to under 50 percent in the early 2000s. This decline mostly reflects a shift of saving into money market funds, bond funds, and the stock market. While traditional banking has declined slightly as a share of GDP, consistent with Table 2, Figure 4 illustrates that essentially all of the growth in the credit intermediation industry has come from

¹³ Output from lending and deposit-taking is calculated using data from Federal Reserve’s *Call Reports*, and FDICs *Historical Statistics on Banking*. Fees on mortgage loans are imputed from BEA benchmark year estimates using annual mortgage origination totals. Fees on credit card accounts are imputed combining *Flow of Funds* data on total credit card debt outstanding with Government Accountability Office data on average credit card fees. Data on service charges on deposit accounts are from FDIC’s *Historical Statistics on Banking*.

transactional services, largely reflected in fees associated with consumer and mortgage credit. A sizable share of the fees can be traced to the refinancing of existing mortgages. Mortgage origination, in turn, is highly dependent on the path of nominal interest rates, which were falling for most of the period we study here and led to extraordinarily high levels of refinancing for a number of years during the period.

Increase in Household Credit and the Development of the Shadow Banking System

Even with the decline in traditional banking, corporate and household credit rose as a share of GDP from 1980-2007. Overall corporate credit grew from 31 percent of GDP in 1980 to 50 percent in 2007, while corporate loans on bank balance sheets fell slightly, from 14 percent of GDP in 1980 to 11 percent in 2007. Household credit, mainly mortgage debt, grew more dramatically – from 48 percent of GDP in 1980 to 99 percent, with the steepest rise occurring during the housing boom of 2000-2006. Despite this growth, banks held roughly the same amount of household credit as a share of GDP—approximately 40 percent— at the beginning and end of the period. All of the incremental growth in household credit as a share of GDP came from securitization. Indeed, as early as 1995, more than half of all outstanding single-family mortgages and a sizeable share of commercial mortgages and consumer credit were securitized.

The growing importance of securitization during the period is not reflected in the BEA's measure of output from lending; if a loan is securitized, the interest rate spread is not included in the measure. If instead we incorporate asset-backed securities in the measure by assigning them the same interest rate spread as loans on bank balance sheets, we estimate that imputed output from lending would have been approximately 0.9 percentage points of GDP higher in 2007. The growth in output from securitization is reflected in the top shaded area of Figure 4. Not surprisingly, it increased significantly during the credit boom of 2000-2006.

It is difficult to know whether securitization was driven by an increased demand for credit by households and firms, or an increase in supply stemming from changes in technology that allowed for easier administration of large pools of securities, or lax regulation. Regardless of the cause, securitization surely facilitated the growth of credit. Importantly, securitization also went hand-in-hand with the growth of “shadow banking,” in which key functions of traditional banking are provided by a host of non-bank financial entities (though often in conjunction with traditional banks). Pozsar, Adrian, Ashcraft and Boesky (2010) define shadow banks as “financial intermediaries that conduct maturity, credit, and liquidity transformation without explicit access to central bank liquidity or public sector credit guarantees.” Like banks, these entities issue short-term, liquid claims and hold longer-term, riskier, and less liquid assets. But unlike banks, they cannot issue insured deposits, and do not have guaranteed access to the Federal Reserve’s lender-of-last-resort credit facilities. Examples of shadow banks include structured investment vehicles that hold loans and asset-backed securities while being funded with short-term asset-backed commercial paper. Money market funds are also shadow banks; they issue short-term claims and hold somewhat longer-term securities. And the government-sponsored entities like Fannie Mae and Freddie Mac hold mortgages and mortgage-backed securities, funded, in part, by issuing short-term debt instruments.

Figure 5 shows that short-term instruments typically associated with the shadow banking sector, including repurchase agreements (repo), money market funds, and commercial paper rose significantly as a share of GDP. This shift coincided with the increasing share of loans that were securitized. Moreover, shadow banking institutions do not operate in isolation, but rather are connected to each other in the credit intermediation process. For example, money market funds hold asset-backed commercial paper, which itself holds asset-backed securities comprised of

loans that are sometimes guaranteed by other entities. Pozsar et. al. (2010) provide a graphical depiction of relationships between the various entities of the shadow banking system.

Shadow banking has increased the number of steps in the credit intermediation process. As noted by Adrian and Shin (2010) and others, the lengthening of the intermediation process, combined with short-term leverage, may bring with it an increase in financial system fragility. We attempt to measure the lengthening of the process using a summary statistic, which we call the Credit Intermediation Index. This measure seeks to estimate the average number of steps a dollar takes as it passes from households to the final end-users, with data from the Flow of Funds accounts. For example, when a household makes a direct loan to a business, this direct finance involves one step. If a household deposits funds in a bank, which then makes a loan directly to a business, there are two intermediation steps. More broadly, the ratio of total liabilities (including the financial sector which is not an end-user of credit) to liabilities of the household, government, and non-financial business sectors (which are end-users of credit) is mathematically equivalent to the expected number of intermediation steps taken by a dollar on the way to its end-user. Thus, the Credit Intermediation Index is defined as:

$$\textit{Credit Intermediation Index} = (\textit{Total Liabilities of All Sectors})/(\textit{Total End-User Liabilities}).$$

Financial sector liabilities, which are a key component of the numerator, include the liabilities of the banking sector: deposits, commercial paper, long-term debt, and gross repo (which are agreements to repurchase securities, and thus are effectively secured loans). They also include money market fund assets, debt of the government-sponsored entities, mortgage pools of the government-sponsored entities, private mortgage-backed securities and other asset-backed-

securities, and the investments of pension funds and mutual funds in credit instruments.¹⁴ The credit instruments that experienced the largest growth are asset-backed securities, borrowing by government-sponsored entities like Fannie Mae and Freddie Mac, government-sponsored entity pools. Many of these securities are in turn held by money market funds and financed by repurchase agreements, both of which grew substantially as percent of end-user credit.

As constructed, this Credit Intermediation Index understates the length of the credit intermediation chain and its growth for several reasons, including: our inability to measure intra-sector intermediation activity; ignoring approximately \$15 trillion of credit derivatives, which transfer risk in the credit intermediation process; understating repos from non-bank entities; and omitting key steps in the credit intermediation chain such as origination by mortgage brokers and mortgage insurance. Nonetheless, our Credit Intermediation Index captures the increasing number of steps involved in credit creation as shown in Figure 6 with most of the increase occurring during the 1990s. This increase is related to the growth of securitization because most asset-backed securities are held by financial intermediaries rather than directly by households. For example, in 2007 approximately 73 percent of outstanding mortgage-backed securities were held by financial intermediaries, including commercial banks (15 percent), government-sponsored entities (16 percent), and mutual funds (11 percent). These intermediaries, in turn,

¹⁴ We are including securitizations in financial sector liabilities. While one could argue that these securities are a form of direct finance, like a corporate bond, they rely much more heavily on the ongoing involvement of a variety of financial intermediaries than would a corporate bond. For example, mortgage pools created by the government-sponsored entities like Fannie Mae and Freddie Mac receive a credit guarantee from those entities. Other asset-backed securities require servicers and collateral managers to make payments to bondholders, deal with defaulted loans, ensure that covenants are not violated, and in some cases move collateral in and out of the securitization vehicle.

often fund their purchases of mortgage-backed securities with debt, thereby lengthening the credit intermediation chain.¹⁵

Evaluation of Growth of Credit Intermediation

A sizable share of the growth of the financial sector can be attributed to the growth in household credit. This growth was likely facilitated by the advent of shadow banking, which expanded the supply of credit to a wider set of households. As noted above, shadow banking also brought fundamental changes in the way credit is delivered.

It is tempting to argue that society must be better off if, by lowering costs, financial innovation expands the supply of credit and households choose to borrow more. In the standard competitive model, expanding supply is welfare enhancing. But, as in our discussion of asset management, a number of considerations give us pause before reaching this conclusion.

First, while credit can play an important role in enabling households to smooth consumption and fund investments, it can also lead to excessive consumption. Laibson (1997) shows that when individuals have self-control problems – which he models with a hyperbolic discount rate – then financial innovation that increases the availability of credit can make these individuals worse off. The steep increase in indebtedness of many low and moderate income households above sustainable levels arguably made many of these households worse off. Many houses financed by the 2000-2007 housing boom now sit empty, and many households that increased their credit card borrowing during the credit boom have defaulted (Mian and Sufi, 2011).

¹⁵ Even if banks do not hold asset-backed securities, they may fund the purchase of asset-backed securities by others such as hedge funds, perhaps through reverse repos. Banks could in turn use the securities in these reverse repos to raise their own repo financing, often from money market mutual funds.

Second, much of the growth in household credit took the form of an increase in mortgage debt. As is well known, the U.S. tax code already biases households towards investments in housing over other types of investments (Sinai and Gyourko 2004). Making mortgage credit cheaper and more available may have exacerbated a preexisting bias.

Third, an increase in household indebtedness may have adverse consequences for macroeconomic stability. For example, Lamont and Stein (1999) show that household leverage increases house price volatility. And Mian and Sufi (2011) show that greater availability of mortgage credit led to large increases in durables consumption, followed by large decreases in consumption when house prices fell during the financial crisis. Households do not take these externalities into account when they choose how much to borrow.

Finally, as noted above, the growth of household credit went hand-in-hand with the growth of shadow banking. While there are a number of theoretical benefits of shadow banking – namely greater liquidity and the sharing of risk across the financial system – the financial crisis revealed significant financial stability costs of shadow banking. In particular, a key attribute of shadow banking is the issuance of short-term financial claims without explicit government guarantees by entities that do not have access the Federal Reserve’s lender-of-last-resort facilities. While these short-term claims may serve a “money-like” role that facilitates financial transactions, as suggested by Gorton and Metrick (2010) among others, they can also undermine financial stability. This occurs because entities financed by short-term claims are exposed to runs when investors become concerned about the entities’ solvency. As Stein (2012) argues, market participants do not internalize the full cost that the possibility of these runs may impose on the financial system, resulting in socially excessive issuance of short-term claims. Shadow banking may have also reduced the stability of the financial system by lengthening the credit intermediation process, which makes it harder for market participants to understand the risk

exposures of their counterparties. This, in turn, increases the risk that any one link will break (Allen, Babus, and Carletti 2010), and exacerbates run-like behavior during a crisis. While a longer credit intermediation chain can provide benefits like intermediary specialization and more liquid financial markets during ordinary times, market participants are unlikely to internalize the impact of a longer chain on financial stability.

Conclusions

Our objective in this paper has been to understand the activities that contributed to the growth of finance between 1980 and 2007, and to provide a preliminary assessment of whether and in what ways society benefited from this growth.

One large part of the growth of finance is in asset management, which facilitated increased diversification and household participation in securities markets. As a result, it is likely that required rates of return on risky securities have fallen, valuations have risen, and the cost of capital to corporations has decreased. The biggest beneficiaries were likely young firms. On the other hand asset management has been incredibly costly, and while some amount of the activity is necessary for informational efficiency and adequate monitoring, there may be too much of it at the margin.

The other major source of growth in the financial sector is a rise in credit intermediation, which changed the process of credit delivery in a way that especially facilitated the expansion of household credit, mainly residential mortgage credit. While there may be benefits of expanding access to mortgage credit, there are a number of societal costs from such an expansion, including instability from excessive household leverage. Moreover, the shadow banking system that facilitated this expansion made the financial system more fragile. This runs counter to the traditional “functional” view of finance, which suggests that a primary function of the financial

sector is to dampen the effects of risk by reallocating it efficiently to parties that can bear risks the most easily (Merton and Bodie 1995). In considering the benefits and costs of the growth of the financial sector, such concerns need to be taken into account.

Our findings raise the question of whether the financial sector will *continue* to grow as a share of the US economy. We have focused here on the extraordinary period of growth between 1980 and 2007, when financial services grew from 4.9 to 7.9 percent of GDP. In 2011, the most recent year for which data are available, financial services remained at 7.9 percent of GDP. On the asset management side, our analysis suggests that unless there is a dramatic reduction in percentage fees, the revenues collected by asset management will largely be driven by the performance of the stock market. On the credit side, much of the growth in credit was driven by declines in interest rates. It seems likely that this source of growth will not persist.

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Figure 1. The Growth of Financial Services

Notes: We use data from the National Income and Product Accounts (1947-2009) and the National Economic Accounts (1929-1947) to compute value added as a percentage of US GDP by activity subtype. Finance includes Insurance, Securities and Funds Management, and Credit Intermediation. Note that Securities and Funds constitute two different categories in later sample years; we combine them into one category for consistency.

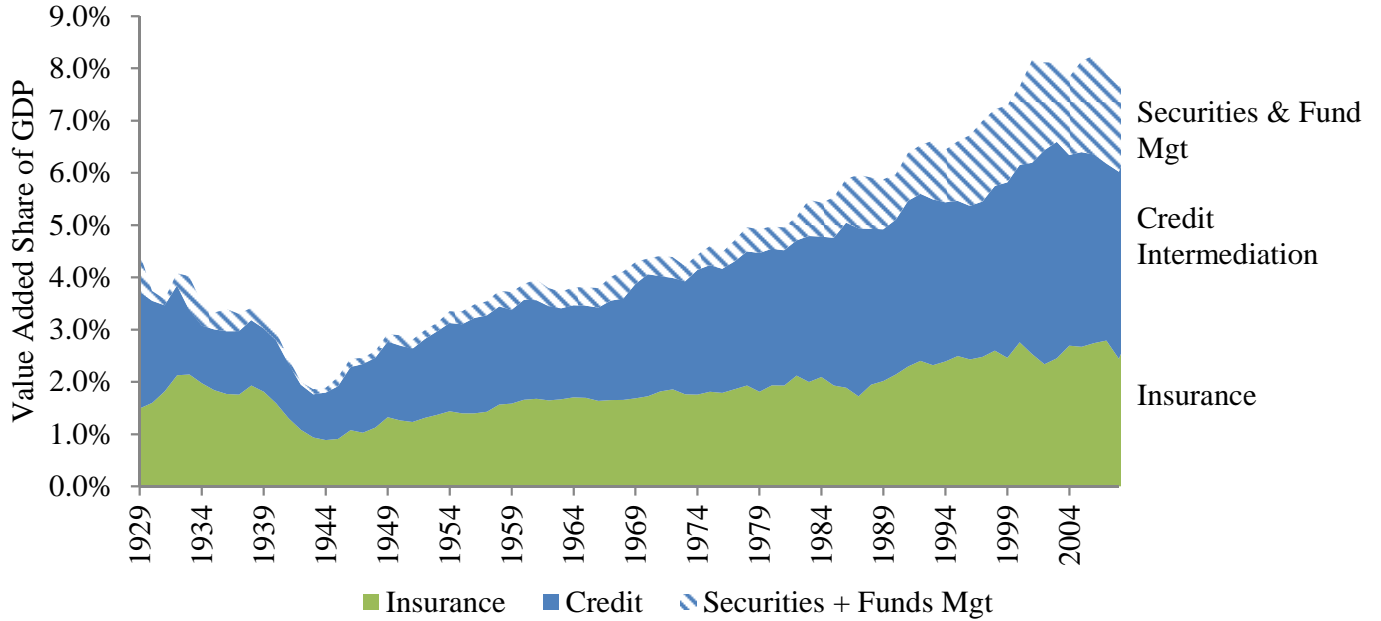


Figure 2. The Growth of the Securities Industry, 1980-2007

Notes: Data are compiled by authors and described further in the text. Other broker dealer investments include revenues from derivatives and commodities trading,

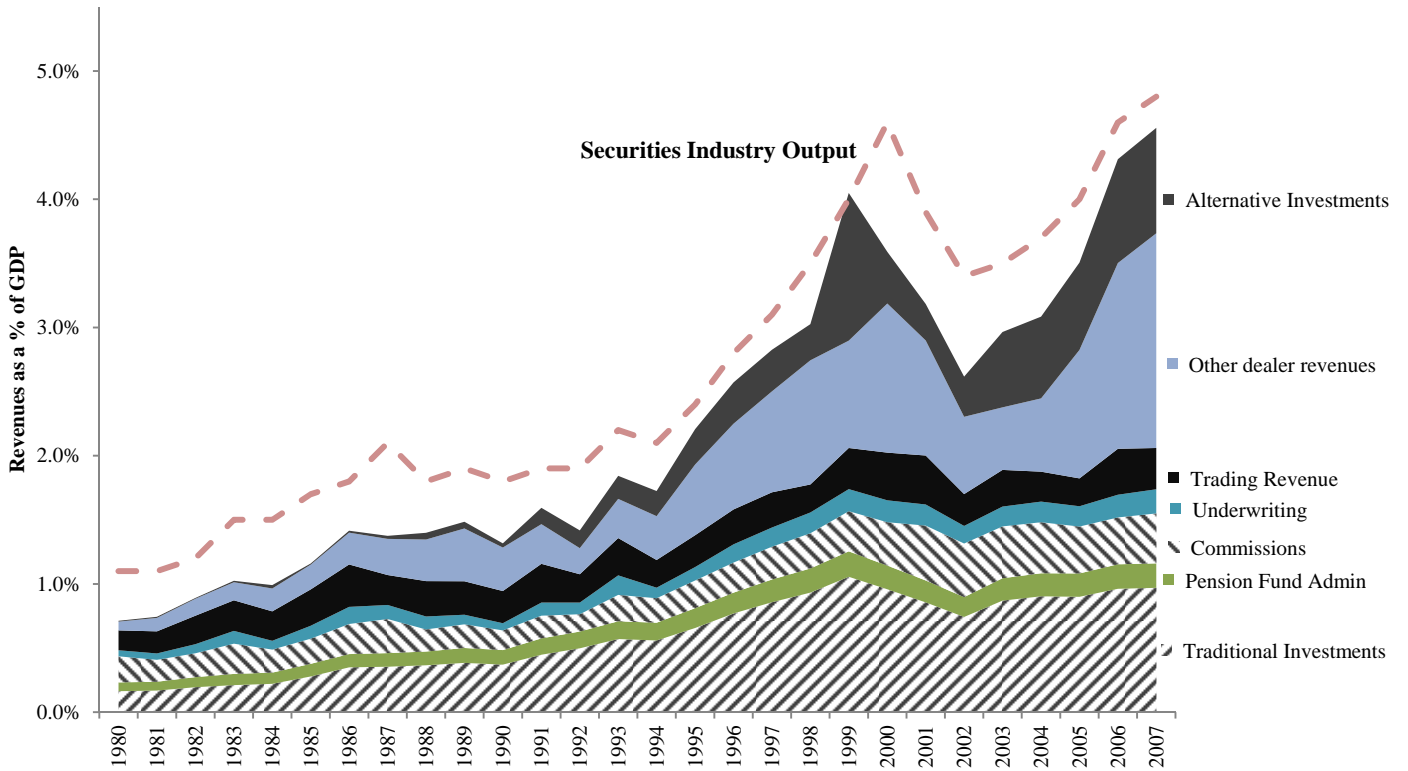


Figure 3
Tradable Assets and Securities Industry Output

Source: Flow of Funds Accounts of the United States, Bureau of Economic Analysis, and authors' estimates.

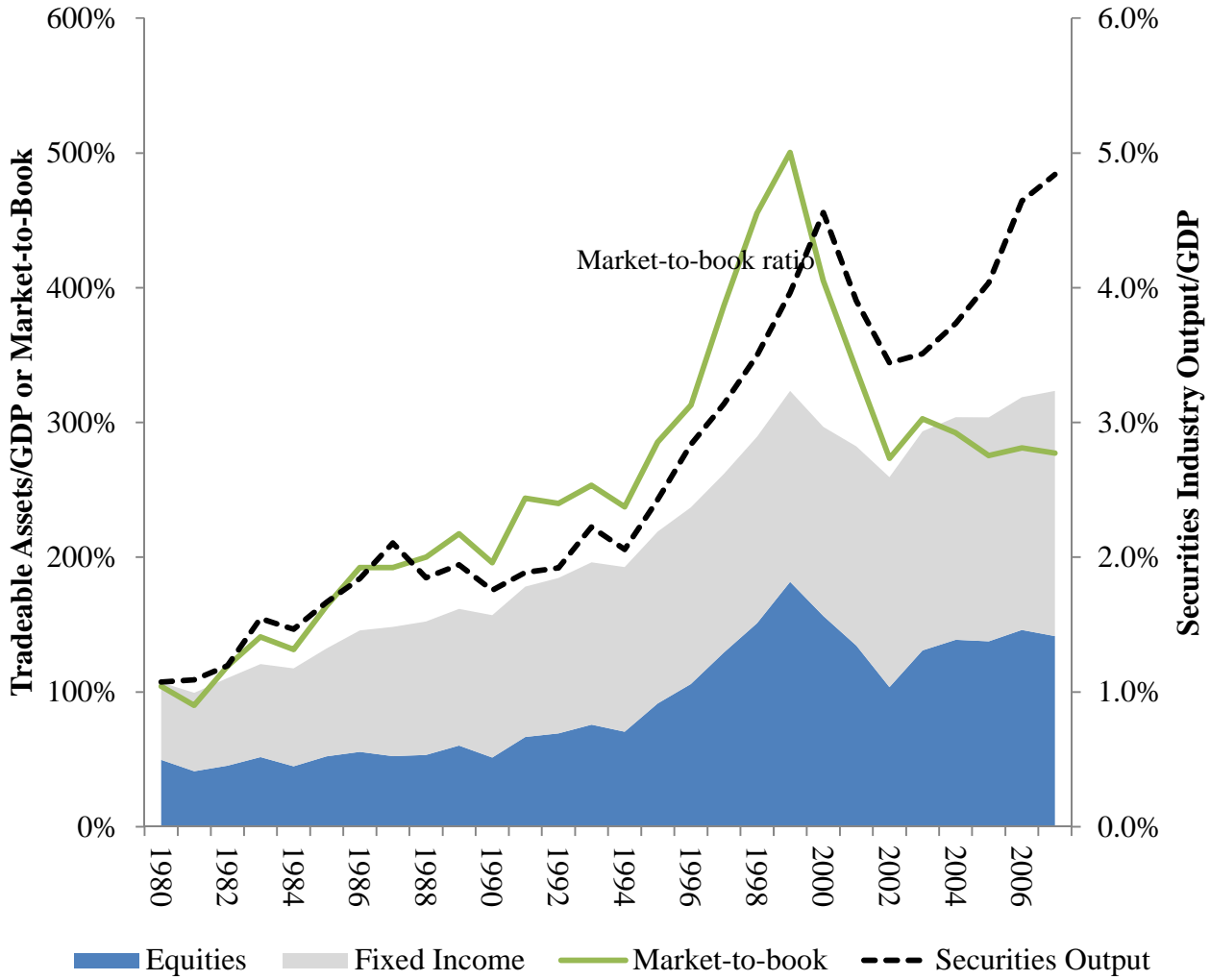


Figure 4. Credit Intermediation Output 1980-2007

Source: Call Reports, Flow of Funds Accounts of the United States, Bureau of Economic Analysis, and authors' estimates. For imputed output, we follow the BEA's methodology.

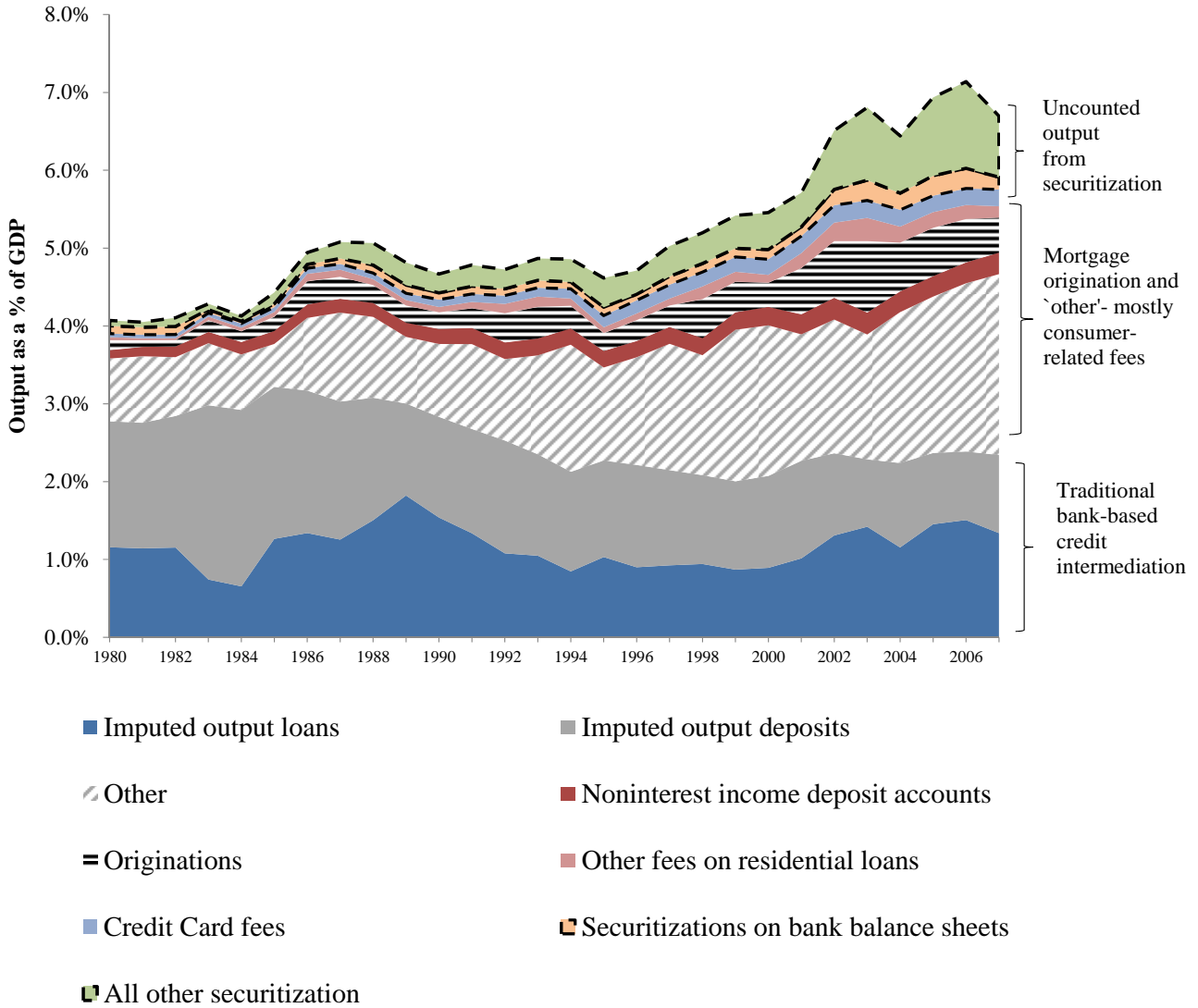


Figure 5. Short-term funding of the financial sector

Notes: Insured deposits and uninsured deposits are only available starting in 1984. MMF refers to money market mutual funds. Financial CP refers to commercial paper issued by financial institutions.

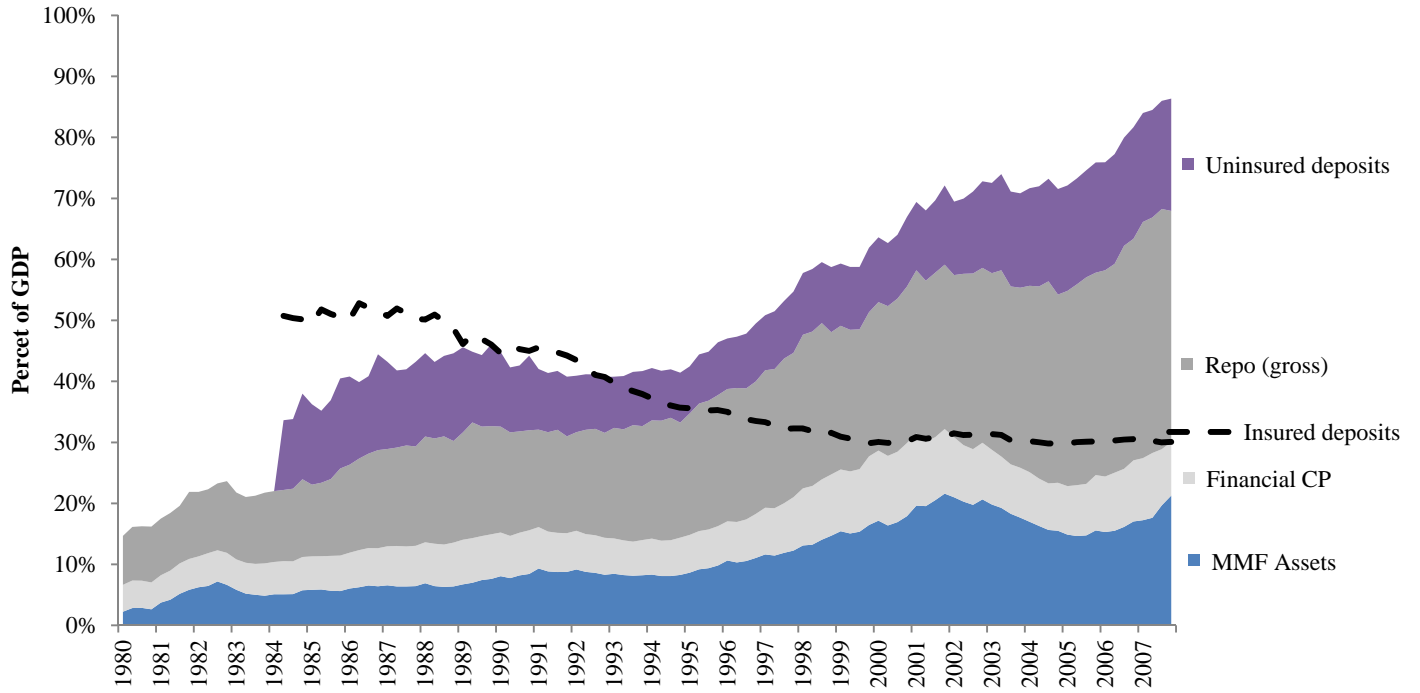


Figure 6. Credit Intermediation Index

Notes: The Credit Intermediation Index is equal to the ratio of gross credit to net credit to end users (government, households, and nonfinancial firms). Household credit and corporate credit are from Table L1 of the Flow of Funds.

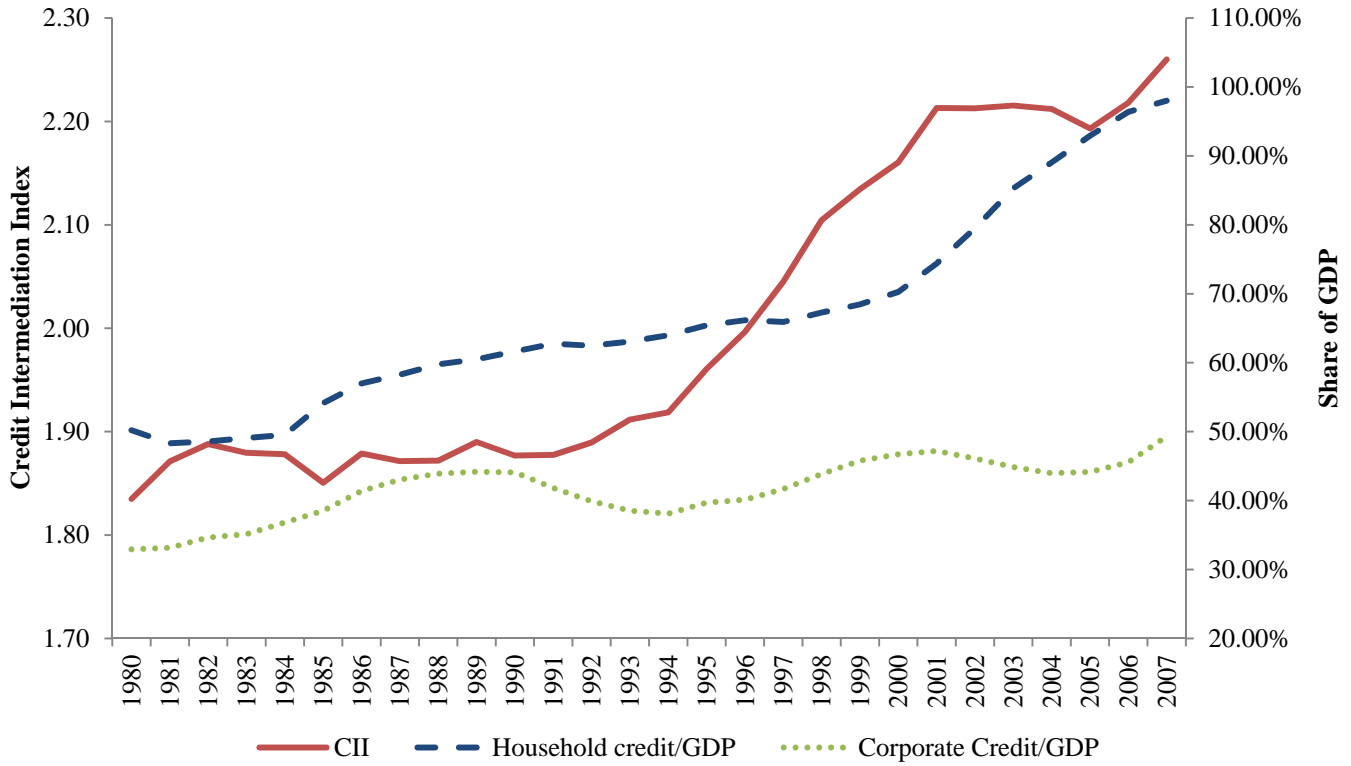


Table 1: Value Added and Output from Securities Firms, Selected Years.

Notes: Bureau of Economic Analysis, Economic Census of the United States. Asset Management consists of financial planning and investment management services, direct expenses associated with mutual funds and pension funds, and Trust services. Other broker-dealer revenue includes brokering and dealing investment company securities, foreign currency, brokerage correspondent fees, and other fees. Missing cells indicate that the item was either zero or grouped into another category.

<u>Industry Outputs, by Activity</u>	\$ billions			% of GDP		
	1997	2002	2007	1997	2002	2007
Asset Management	82.8	199.2	341.9	0.99%	1.87%	2.43%
Fees and commissions from trading equities	55.6	57	74.1	0.67%	0.54%	0.53%
Trading gains	33.8	19	45.1	0.41%	0.18%	0.32%
Securities underwriting	28.3	22.1	35.1	0.34%	0.21%	0.25%
Profits from derivative contracts		16.3	45.3		0.15%	0.32%
Brokering and dealing debt products - debt instruments			36.5			0.26%
Management of financial market and clearing products			22.9			0.16%
Other broker-dealer revenue	18.4	40.6	56.2	0.22%	0.38%	0.40%
Other	2.6	1.7	19.0	0.03%	0.02%	0.14%
Total Securities Outputs	221.5	355.9	676.1	2.66%	3.34%	4.81%
By-Products produced by Securities Firms (revenues collected by securities firms for other activities)	5.5	7.6	11.7	0.07%	0.07%	0.08%
Total Inputs	89.4	131.8	364.6	1.07%	1.24%	2.59%
Revenues collected by non-securities firms for securities-related activities	9.4	52.8	82.1	0.11%	0.50%	0.58%
Value Added by Securities Firms	128.1	179.0	241.2	1.54%	1.68%	1.72%
Value Added for all Securities-related Activities	129.2	206.4	284.0	1.55%	1.94%	2.02%

Table 2: Value Added and Output from Credit Intermediation Firms, Selected Years

Source: Bureau of Economic Analysis, Economic Census of the United States, and Authors' estimates. Firms engaged in credit intermediation are mostly banks, but also include credit unions and other savings and lending institutions.

Industry Outputs, by Activity	\$ billions			% of GDP		
	1997	2002	2007	1997	2002	2007
Traditional banking (imputed output)	179.1	253.9	328.9	2.15%	2.39%	2.34%
Lending	76.8	99.2	102.2	0.92%	1.32%	1.34%
Deposit-taking	102.3	79.9	76.9	1.23%	1.07%	1.00%
Transactional services (fees)	186.1	328.0	487.7	2.25%	3.08%	3.47%
Deposits and cash management	24.7	57.5	78.4	0.30%	0.54%	0.56%
Credit card accounts	23.8	23.7	29.6	0.29%	0.22%	0.21%
Other products supporting financial services	17.8	55.0	76.3	0.21%	0.52%	0.54%
Loan origination, non-residential	14.0	20.2	27.9	0.17%	0.19%	0.20%
Loan origination, consumer residential	11.3	76.8	62.3	0.14%	0.72%	0.44%
ATM and electronic transactions	3.0	6.2	8.6	0.04%	0.06%	0.06%
Other	91.5	88.6	204.6	1.10%	0.83%	1.46%
Total Credit Outputs	365.2	582	816.6	4.38%	5.47%	5.82%
Bank revenues from activities other than credit intermediation	67.3	109	130.3	0.81%	1.02%	0.93%
Total Inputs	180.8	239.9	455.2	2.17%	2.25%	3.24%
Revenues collected by non-banks for credit-related activities	3.8	15.2	14.9	0.05%	0.14%	0.11%
Value Added by Credit Intermediation Firms	247.9	436	476.9	2.97%	4.10%	3.40%
Value Added for all Credit Intermediation Activities	211.2	374.7	415.1	2.53%	3.52%	2.96%