The Growth of Modern 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 for residential mortgages. This expansion was itself fueled by the development of non-bank credit intermediation (or “shadow banking”). Whether the growth of the financial sector has been socially beneficial depends on one’s view of active asset management, the increase in household credit, and the growth of shadow banking. While recognizing some of the benefits of professional asset management, we are skeptical about the marginal value of active asset management. We then raise concerns about whether the potential benefits of increased access to household credit -- the main output of the shadow banking system – are outweighed by the risks inherent in this new approach to credit delivery.

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1. Introduction

During the last 30 years there was enormous growth in the financial services sector. This growth is apparent whether one measures the importance of finance 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% to U.S. GDP, compared to 4.9% in 1980 and 2.8% in 1950. Figure 1, following Philippon (2008) and constructed from a variety of historical sources, shows that that the finance share of GDP increased at a faster rate since 1980 (13 basis points per annum) than it did in the prior 30 years (7 basis point per annum). The figure breaks financial services growth into three broad groups of activities: securities, credit intermediation, and insurance. It is securities and credit intermediation that are responsible for the acceleration of growth since 1980; insurance, by contrast, has grown at a steady pace since the 1940s.

Another measure of the growth of the financial sector is the quantity of financial claims and contracts, including stocks, bonds, derivatives, and mutual fund shares. Figure 2, which is based on the Flow of Funds accounts, shows that the value of total financial assets across all sectors was approximately five times U.S. GDP in 1980; by 2007, this ratio had doubled. Over the same period there was a similar increase in the ratio of financial assets to tangible assets (e.g. plant and equipment, land, residential structures). 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.

The U.S. was not the only country to experience such dramatic growth in financial services. However, the U.S. is one of a small handful of mostly English speaking countries where the financial sector grew to over 7% of national output. Figure 3 shows the financial services share of GDP for several countries for which we have data in both 1990 and 2006.
Workers in the financial sector have shared impressively in these gains: 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% more (Phillipon and Reshef, 2009). Attracted by high wages, graduates of elite universities flocked into the industry: in 2008, 28% of graduates of Harvard College went into financial services, compared to only 6% between 1969 and 1973 (Goldin and Katz, 2008). And 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).

The growth in expenditures on financial services raises the question of how much and in what ways society has benefited from these expenditures. Some might suggest that this growth implies that the incremental benefits outweigh the incremental costs, essentially invoking the First Fundamental Theorem of Welfare Economics. Indeed, this line of argument would seem to be a reasonable starting point to assess growth in most industries. And yet, there is something different about finance that makes many skeptical that its growth has benefitted society. For one, there is skepticism about the incremental social value of securities trading given that much of it is zero-sum in nature. And many have voiced concerns about the considerable increase in complexity that appears to have come with the growth of the financial sector. This complexity is seen as a source of risk to the broader economy, with some arguing that it only functions to generate additional profits for financial market participants. This view stands in contrast to the more traditional “functional” view of finance, in which the sector dampens risk by reallocating it efficiently within the economy.

In this article, we evaluate whether the skepticism about the value of finance is warranted. We start by identifying the activities that have generated the largest growth in
financial sector revenues. We do this by compiling the detailed activity-level revenues published in the input-output accounts of the Bureau of Economic Analysis (BEA) and the Economic Census, along with our own estimates of activity-level revenues between 1980 and 2007. We then link the areas of greatest revenue growth to changes in the machinery of financial intermediation, particularly in credit. And, we ask how and whether these changes have benefitted society more broadly.

Our analysis identifies two areas of significant revenue growth: asset management and, more surprisingly, fees associated with the expansion and refinancing of household debt. The value of assets under professional management grew dramatically, with the fees charged to manage these assets growing at approximately the same pace. Individuals and institutions shifted an increasing share of their assets to investment management firms – first to mutual funds and institutional asset management firms (which mainly manage investments for pension funds and endowments), and then increasingly to hedge funds, private equity funds and venture capital funds, which charge much higher fees. We show that a large part of this growth is a simple consequence of rising asset values without commensurate declines in percentage fees.

There was also enormous growth in household credit, from 48% of GDP in 1980 to 99% in 2007. Most of this growth was in residential mortgages (from 34% to 79% of GDP), although consumer debt (auto loans, credit cards, and so on) also grew (from 13% to 18% of GDP). We show that the growth in household credit contributed to the growth of the financial sector mainly through fees on loan origination and refinancing, securities underwriting, trading of fixed income products and derivatives, as well as asset management. Surprisingly, traditional corporate debt grew by much less, and played little role in the revenue growth of the industry.
The fact that the financial sector profited from household credit mainly through fee income reflects a major shift in the machinery of the financial system. While at the start of the period the financial system allocated credit largely through deposit-taking banks that earned spreads on the loans they held on their balance sheets, by the end of the period, 61% of home mortgages were in loan pools of mortgage-backed securities (MBS), 72% of which were guaranteed by the Federal Housing Administration (FHA) or one of two Government Sponsored Enterprises (GSEs), Fannie Mae or Freddie Mac.

The securitization of credit was part of the development of the “shadow banking” system whereby many different types of non-bank financial entities performed some of the essential functions of traditional banking. Like traditional banks, shadow banks issued short-term, seemingly-safe and liquid claims to fund the purchase of longer-term, less liquid and more risky loans and securities. But they were more loosely regulated than banks and had few of the safety nets afforded to banks, such as access to the Federal Reserve’s “lender-of-last-resort” credit facilities. The heavy reliance on short-term funding of shadow banking entities proved to be a major accelerant of the financial crisis. Moreover, shadow banking had the effect of lengthening the credit intermediation process, meaning that it introduced more links in the chain connecting household savers with borrowers. We propose a simple index to measure the increase in the length of the credit intermediation chain and the associated increase in complexity.

Thus, to assess whether the growth of the financial sector has been beneficial to society one must take a view on the social benefits of active asset management, the increase in household credit, and the growth of shadow banking. In our view, professional asset management facilitated an increase in financial market participation and diversification, which likely decreased required rates of return and lowered the cost of capital to corporations. At the
same time, there is likely too much high-cost, active asset management. We also raise concerns about whether the potential benefits of increased access to household credit -- the main output of the shadow banking system -- are outweighed by the risks inherent in this new approach to credit delivery.

2. The Growth of the Securities Industry

A. Components of Growth

Table 1, which covers the period 1980-2007 and is based on the national income account published by the BEA, shows the contribution to GDP of the industries comprising the financial services sector: securities, credit intermediation, and insurance. The GDP contribution, or “value added,” is measured as net revenues of an industry less non-wage inputs to the industry. Equivalently, value added is just profits plus compensation.

In the next two sections, we focus on the growth of the securities and credit intermediation industries, leaving aside insurance. While insurance interacts in interesting ways with securities and credit intermediation (primarily through asset management, reinsurance, and

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1 Details on all data sources and calculations for this section and the next are provided in the Internet Appendix.

2 If we follow the BEA’s terminology, financial services (which includes the industries of securities, credit intermediation, insurance, and trusts) is part of the financial services and real estate sector. For simplicity, we refer to the financial services sector throughout.

3 Government statistics make a distinction between “securities” and “funds and trusts,” where the latter refers only to the administration of the fund vehicle and not to its investments. However, the funds management industry is quite small and only includes expenses associated with the mutual fund and trust structure, and not any of the fees or costs for portfolio management. Because this distinction is artificial we combine both activities into a broader measure of the securities industry.

4 We study GDP, not GNP. As pointed out by Philippon (2012), net exports of financial services are not as large as one might think. The investment bank Morgan Stanley, for example, derived 81% of its 2009 net revenues from the Americas. And, among the ten largest commercial banks based in the US, only Citigroup derived a significant fraction of its revenue from outside the country. According to the OECD, net exports of financial services are less than 0.3% of GDP.
bond insurance), the industry’s growth since 1980 is less puzzling. This is because changes in the industry’s value added 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, falls outside the scope of this article.

Within financial services, the largest growth was in the securities industry. Revenues grew from 1.1% of GDP in 1980 to 4.8% in 2007 and value added grew from 0.4% of GDP to 1.7% in 2007 (having peaked at 2.0% in 2001 during the internet boom). In fact, the value added statistics slightly understate the growth of activities usually associated with the securities industry – most notably asset management and debt trading – because an increasing share of these activities is being done at commercial banks rather than at securities firms. In 2007, for example, according to data from the Economic Census, banks collected approximately $13 billion from asset management and financial planning, and approximately $39 billion from brokering and dealing debt instruments and derivatives.

To get a better sense of the components of growth within the securities industry, we break down industry revenues using data from the input-output accounts and data from the Economic Census. Unfortunately, detailed breakdowns are only available for 1997, 2002, and 2007. We start with a description of these years, and then pan back to 1980, constructing our own estimates of the components of revenue..

Table 2 shows that asset management is by far the largest component of the securities industry, equal to $341.9 billion in 2007, well over four times the level in 1997. What we call “asset management” includes investment advisory and management (approximately $250 billion
in 2007), the administration of mutual and pension funds, and trust (custody) services. Asset management was 37% of securities industry output in 1997, and rose to 51% in 2002 and 2007.

The two other activities that appear to have grown substantially are market-making in fixed income products, with revenue of $37 billion in 2007, and derivatives trading with revenue of $45 billion. In 1997, these categories were not even reported, suggesting that they were an insignificant revenue source. Together, these activities account for 18% of revenue growth in the industry between 1997 and 2007.

Further data on profits from derivatives trading and origination are sparse, but a 2011 Goldman Sachs response to a government enquiry suggests that most of the profit in derivatives is related to fixed income trading. This is consistent with reports that about half of the gross market value of OTC derivative contracts in 2007 were linked to interest rates or credit, while only 7% were linked to equity, according to the Bank for International Settlements. Wall Street dealer banks have historically maintained high profit margins on derivatives because they are traded over the counter (not an exchange), giving the individual dealers a degree of pricing power.

Interestingly, a substantial fraction of the revenues from both derivatives and debt trading accrued to parties other than broker-dealers. For example, according to the Economic Census, approximately one third of the revenues from derivatives, and two thirds from dealing debt instruments, were generated by commercial banks. When we later turn to credit intermediation,

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5 Aggregating across U.S. bond markets, average daily trading volume in 2007 was just over $1 trillion, which means that we can interpret fixed income revenues as reflecting an average bid-ask spread of 0.015%, roughly twice the spread on U.S. Treasury Securities (Fleming, 2001). This revenue was presumably much higher than it had been in the other Census years given that this number was not even reported in those years. 37/(252x$1trillion)=0.0154%. Volume is reported in the Securities Industry and Financial Markets Association 2010 Factbook. They rely on FRBNY, the Municipal Securities Rulemaking Board, and NASD TRACE for their estimates of trading volume.
we argue that the increase in derivatives and debt trading was partly driven by the growth of the shadow banking system.

Fees from trading equities – while the second largest component of securities output – remained essentially flat as a percentage of GDP between 1997 and 2007 even though dollar trading volume on NYSE, NASDAQ, and AMEX exchanges grew from $10.4 trillion to $41.4 trillion. This is explained at least in part, by innovations in technology that substantially lowered the unit cost of trading equity (Hasbrouck, 2009).

Ideally, we would be able to construct detailed revenue breakdowns from Table 2 going back to the 1980s. The BEA’s data do not allow for this, and so we use a variety of alternative sources to construct yearly estimates. Panel A of Figure 4 shows annual estimates of the revenues from several key activities: traditional asset management, alternative asset management, and broker-dealer activities. Due to differences in the underlying data, these categories do not correspond exactly to the product lines measured in the Economic Census, but collectively they capture the most important activities of the securities industry. In a few cases, different data sources yield conflicting figures for revenues from a given activity, and we use judgment to combine them. Despite the data limitations, Figure 4 shows that we match the level and changes in securities industry output reasonably well.

Fees earned from traditional asset management – mutual funds, exchange-traded funds, and institutional funds – along with administration costs of pension funds are the largest component of industry output and are generally an increasing share of output until 1998. We estimate total fees using data from Investment Company Institute (ICI) and Ken French (2009). The largest component of these fees comes from mutual funds (including money market mutual funds), which grew from assets under management (AUM) of $134 billion in 1980 to over $12
trillion in 2007. Because fees are essentially a constant fraction of AUM, they fell in 2001 with
the bursting of the internet bubble, rose to hit their prior peak in 2004 and continued to grow
thereafter. Although there are fluctuations, the key point is that between 1980 and 2007 there
was huge growth in fees from traditional asset management.

The revenues accruing to alternative asset managers -- hedge funds, private equity funds,
and venture capital funds -- are shown in Panel B of Figure 4. Estimating fees accruing to
managers of these vehicles is difficult, particularly in the case of venture capital and private
equity, because a portion of the fees accrues when the fund exits from its investments. We follow
French (2009) to compute hedge fund fees, using AUM data from Hedge Fund Research. For
private equity and venture capital, we update to 2007 estimates of dollar fees shown in Kaplan
and Rauh (2010). The figure shows a steady growth of fees, with a spike in 1999 corresponding
to a record number of exits in both private equity and venture capital. Hedge fund fees grow
more steadily over this period, peaking at $69 billion in 2007. Although percentage fees for
alternative investment vehicles vary year-by-year, they are typically between 3% and 5% of
AUM, considerably higher than mutual funds.

One limitation of our asset management estimates is that we do not accurately capture the
growth of investment advisory and managed accounts (although these are included in the Census
data in Table 2). These services introduce another layer of fees on top of the management fees
that go to traditional and alternative investment managers. Historically, investment advisors
charged trade-based commissions, which are captured by FOCUS reports that broker-dealers file
with the Securities and Exchange Commission. But, a large number of advisors now mainly
charge fees based on assets under management. Increasingly, these services are being provided
by investment branches of commercial banks. For example, the U.S. division of UBS Wealth
Management reported income of $6.1 billion on end-of-year AUM of $764 billion, an implicit fee of 0.79%. In 2007, total AUM in the U.S. was approximately $3.6 trillion. Using estimated fees of approximately 1%, this yields another $36 billion of revenue that is not reflected in Figure 4.

Figure 4 also tells us that broker-dealer activities – commissions, trading, equity market making, and underwriting – cannot explain the growth of the securities industry. Estimates of aggregate revenues for these activities are based on FOCUS reports and made available by Financial Industry Regulatory Authority. These data show that there was a secular decline in underwriting fees from 1980, even though U.S.-domiciled institutions advise and help underwrite a significant fraction of global securities issuance. By 2007, revenue from underwriting stocks and bonds was a mere 5% of securities industry revenue. Although the FOCUS reports provide quite a bit of detail, a large fraction of broker-dealer revenue consistently shows up in the category “other,” which is shown as such in Figure 4. We do not have more details on the components of this category, but the earlier numbers in Table 2 hint that much of the residual in the later sample years could be coming from debt and derivatives trading, which is not broken out separately in the FOCUS reports.

To summarize our findings so far, we have shown that the securities industry was responsible for the largest component of financial sector growth and that within securities, growth was driven by asset management. This growth occurred in two stages. In the first, from 1980 until roughly 1999, revenues grew in large part because of traditional asset managers. In the second stage, alternative assets (including venture capital, private equity, and hedge funds) generated an increasing share of fees. During this period as well, debt and derivatives trading contributed to the growth of the securities industry.
B. What Drove the Increase in Asset Management Fees?

Total asset management fees are the product of (i) the total outstanding amount of tradable assets; (ii) the share of tradable assets that are professionally managed; and (iii) the percentage fee. We show that total fees increased because the percentage fee remained essentially constant, while investment managers came to manage a large share of a larger value of financial assets.

(i) Increase in tradable assets. Panel A of Figure 5 shows the value of traded equity and fixed income securities over time. Taken together, tradable assets increased 107% of GDP in 1980 to 323% of GDP by 2007. The figure shows that scaled by GDP, securities industry output closely tracks the total value of tradable assets.

What drove the increase in tradable assets? On the fixed income side, 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% of GDP in 1980 to 182% of GDP in 2007; approximately 58 percentage points of this growth came from securitization.6

On the equity side, much of the growth in tradable assets came from higher equity market valuations. Panel B of Figure 5 shows the strong effect of valuation ratios on the dollar value of publicly traded equity; the price-to-book ratio of the S&P 500 closely tracks the value of publicly traded equity. This figure also shows that the book value of equity of publicly-traded firms normalized by GDP is essentially flat through this period. Thus, the growth in the value of

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6 Not all of these assets are held in the United States, or accrue fees to US-based financial intermediaries. See Bruno and Shin (2012) and Shin (2012).
publicly-traded equity relative to GDP does not come from an increase in the number of firms or the earnings generated by incumbent firms, but rather from an increase in valuation ratios. As a consequence, much of the rise in asset management fees came from an increase in the price-to-book ratio.

(ii) Increase in share of tradable assets that are professionally managed. According to the *Flow of Funds*, 53% of household holdings of equity were professionally managed in 2007, compared with only 25% in 1980. We do not have comparable statistics for fixed income but it is likely that there was a similar pattern of an increase in the share of assets that were professionally managed.

(iii) Percentage fees remain approximately unchanged. A simple way to measure the all-in fees paid for investment management is to compute the ratio of securities industry output to the dollar value of tradable assets. This calculation is not an exact measure of the expense ratio, because the fraction of assets that are professionally managed fluctuates over time, and also because the securities industry collects revenues from underwriting and other activities not directly related to asset management or trading. Notwithstanding these caveats, Panel C of Figure 5 shows that the average all-in fee per dollar of tradable assets has fluctuated between 1% and 1.5% for the entire period.

The fact that asset management fees have not changed very much is part of a larger puzzle—fees are almost universally computed as a roughly fixed percentage of assets under management. If the stock market doubles in value through price appreciation, there is no obvious
reason why investment management services in the aggregate would be worth more, or would cost more to provide.\footnote{Fixed percentage fees can be justified if one believes that a manager has the ability to create alpha, but that alpha exists in a fixed dollar supply (or is increasingly difficult to achieve with higher assets). In this case, larger asset pools should pay higher fees. But this argument does not hold in the aggregate, since alpha is zero sum across investors.}

The stability of aggregate asset management fees as a percentage of assets under management obscures significant changes in how those fees are spread across different institutions. As shown previously, mutual fund fees as a share of GDP have been rising steadily since the early 1980s. But this is mostly driven by mutual fund companies managing a larger dollar value of publicly traded equities, rather than by an increase in their fees on a dollar of assets. According to French (2009), the all-in fee (including annuitized “load” which is paid to financial advisors on the sale of a mutual fund) on equity-related mutual funds fell from 2.19\% of assets in 1980 to 1\% in 2007. Using data from ICI, we find that the equivalent fee on bond funds fell from 2.04\% to 0.75\%. In short, at the retail level, U.S. households have many more passive low fee vehicles available to them, even if they do not take full advantage of them. For example, in 2011 a household with modest investable assets could invest in a U.S. stock index with Vanguard, the largest passive investment manager, for an annual fee of 0.07\% of assets. At the institutional level, fees have also dropped. Using data from Greenwich Associates on fees paid by pension funds, French (2009) reports that the dollar-weighted fee on institutional equities fell from 0.34\% in 1980 to 0.23\% in 2006.\footnote{These low figures partly reflect the large share of these assets managed passively; fees on actively managed portfolios are considerably higher. On the fixed income side, data from Greenwich Associates suggests that average fees are approximately 0.30\% of assets.} According to Greenwich Associates, institutional managers paid their active fixed income investments an average of 0.30 percent of assets in 2008.
While mutual fund fees per dollar of assets have fallen, fees on alternative investments – hedge funds, venture capital, and private equity – have not. Most funds have consistently charged a management fee of 1.5-2.5% of assets, plus a “carry” on realized gains of 15-25%. The combination of high and stable fees on alternative investments and faster growth in their assets under management means both that they are collecting more fees and that their share of total investment management fees has been increasing. Panel B of Figure 4 provides our estimates of the fees charged by hedge funds, venture funds and private equity funds. We estimate that by 2007, approximately $854 billion of assets was managed by private equity firms, $258 billion by venture capital funds, and another $1.46 trillion by U.S.-domiciled hedge funds. Our estimates suggest that together these managers generated over $100 billion of fee revenue in that year. This is more than the fees on equity mutual funds, bond mutual funds, and money market funds combined, which collectively manage more than eight times as much in assets.

In summary, the average percentage fee paid to investment management has not fallen much over time as high-cost alternative investments have become a larger share of assets under management. But the growth in assets under management -- much of it coming from higher valuations – has led to enormous growth in the expenditures on investment management.

C. Evaluation of the Growth of Asset Management

To evaluate the net benefits of active asset management, we start with the costs. As suggested above, the cost of active asset management appears to be high. Why have investors been willing to pay such high fees? Part of the answer may be that investors are naïve. Capon, Fitzimons and Prince (1996), Alexander, Jones and Nigro (1998), among others, present evidence that households do not understand the financial products they buy. That means they
also probably don’t understand that it is hard to identify managers who can generate risk-adjusted excess returns (“alpha”). Instead, they chase past performance (Sirri and Tufano 1998). Some investors may try to overcome their naiveté by hiring an investment advisor they trust, but Gennaioli, Shleifer, and Vishny (2012) argue that intermediaries exploit this trust to by charging them high fees for “hand-holding” investment advice. Worse yet, Bergstresser, Chalmers, and Tufano (2009) show that financial advisors, if anything, steer clients to worse performing funds.

Pension fund and endowment managers are presumably less naïve and need less hand-holding, but institutional factors and agency problems may lead them to overpay for active management. For example, Novy-Marx and Rauh (2009) point out that if public pension funds invest in riskier asset classes and thereby forecast higher returns, they can discount reported liabilities at a higher rate and appear to be less under-funded than they really are. And Hochberg and Rauh (2012) show that public pension fund managers overweight local private equity funds in their portfolios and significantly underperform on those investments. Given that pension fund managers appear not to be value maximizing in their asset allocation, it could also be true that they overpay for private equity and other alternative investments.

High asset management fees may, in turn, be part of the reason so much talent has been attracted to the industry. Indeed, as noted above, during this period of growth in the financial sector, a larger share of graduates of elite universities were attracted to the sector. Philippon and Resheif (2009) show that the securities industry in particular – not credit intermediation and insurance – witnessed steep wage growth from 1980-2006. To the extent that these wages are economic rents, they could divert talent away from sectors that are more productive but where the rents are lower. This misallocation of talent would be an additional cost of asset management. However, to the extent that talent is being reallocated from other rent-seeking
activities such as some legal services (Goldin and Katz, 2008), the social costs may not be quite so high.

These direct and indirect costs of asset management need to be weighed against the potential benefits. We identify three: (i) an increase in participation and diversification; (ii) an increase in monitoring; and (iii) an increase in the information embedded in securities prices. We consider each in turn.

(i) Participation and Diversification. One of the clear benefits associated with the increased use of professional asset management is that households now hold more diversified portfolios. It is much easier to assemble a diversified portfolio with a collection of mutual funds than through direct ownership of individual securities. This is particularly true for foreign stocks. Indeed, as professional asset management has grown so has U.S. residents’ holding of foreign equities – from 2.0% of their portfolios in 1980 to 27.2% in 2007 (French, 2008).

Asset management also facilitated an increase in household financial market participation. The share of household financial assets held in marketable securities or mutual funds grew from 45% in 1980 to 66% in 2007. It is not just that the wealthy increased the exposure to marketable securities. According to the Survey of Consumer Finances, the percentage of households owning stock increased from 32% in 1989 to 51% in 2007.

In short, the growth of asset management is associated with an increase in households’ willingness and capacity to take market risk. In theory, required rates of return should have declined as a result. It is therefore possible (but hard to verify) that asset management was indirectly responsible for the large increase in stock market valuation ratios between 1980 and 2007. This, in turn, may have led to a decline in the cost of capital to corporations. The greatest beneficiaries then would have been young, entrepreneurial firms – those most dependent on
equity financing and with more distant cash flows. This may help to explain some of the growth of venture capital after 1980, and the greater ease with which entrepreneurial ventures were able to raise funding. It is indeed possible that the growth of asset management had significant positive effects on the real economy. At the same time, all of this might have been possible had asset management charged lower fees. And, while financial market participation has increased, asset allocation by households has been far from ideal (Calvet, Campbell, and Sodini 2007).

(ii) Monitoring. A second potential benefit of professional asset management is that some professional money managers are active monitors of management. By pooling resources of many smaller investors, professional managers can afford to incur some of the costs of monitoring management, thereby mitigating the free-rider problem that exists among small investors. This is certainly true of venture capital and private equity firms, which often control the boards of directors and write contracts that control the actions of management (Gompers 1995; Kaplan and Stromberg, 2003). Hedge funds can also play an active role in monitoring management of public firms (Jiang, Partnoy, and Thomas 2008; Greenwood and Schor 2009). Unfortunately, the evidence is mixed that such monitoring created value.

(iii) Information. A third potential benefit of the increased use of professional asset management is that it leads to more informational efficiency of securities prices, whereby securities trade at smaller deviations from fundamental value. This could be because active asset managers are more adept than individual investors at assessing a security’s value, or because there are economies of scale in collecting and interpreting information. However, the evidence that active managers are successful in outperforming passive index funds – i.e., in generating alpha – is quite slim. For example, Fama and French (2010) show that U.S. mutual funds
underperform the stock market, especially after taking into account fees. At the margin, it seems, investors would do better to reduce their allocation to active management.

From a social benefit perspective, the critical question is not whether active management leads to excess returns—it does not. Rather what matters is whether the pursuit of excess returns produces socially valuable information. The social benefits from efficient markets are difficult to measure. In theory, the main benefit is that firms can raise new capital at prices that accurately reflect their fundamental value, i.e., that they can raise money in primary markets to fund real investments. If prices are closer to fundamental value it encourages firms to invest in the most productive projects, and to choose the appropriate scale of investment over time. One area in which information is particularly valuable is in the funding of start-up firms, which can receive funding from venture capitalists who hope to exit their investments in the public equity market.

While information is valuable in allocating capital, much information discovery is oriented toward trading securities in the secondary markets, i.e., trading securities that already exist. Some of this information may spillover to benefit firms issuing new securities, or in guiding corporate investment, but not all information collection for which investors are paying 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 production of this type “foreknowledge,” but explains that it has no social value in an exchange economy without production. In other words, the $20,000 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. An extreme but still representative example of this comes from the socially costly technological
arms race to offer “co-location hosting services” in financial centers, enabling electronic orders to arrive milliseconds faster because of their geographical proximity. Glode, Green, and Lowery (2012) and Turley (2012) explore models of trading that build on the Hirshleifer intuition.

Indeed, despite greater investments in information acquisition and trading speed, there is no concrete evidence to support the idea that equity markets have become any more informative in the sense of prices being closer to long-run fundamentals. Bai, Philippon, and Savov (2012) suggest, for example, that financial markets are approximately as efficient in pricing industries today as they were in 1960. And a good deal of evidence supports the idea that mutual funds simply channel investor flows into the sorts of securities that investors want to own (internet, value, high-yield bonds and so on) rather than allocating capital to its best use (Frazzini and Lamont 2009). Finally, it is noteworthy that over the last 15 years alone, we have experienced 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. Overall, this is consistent with Paul Samuelson’s well-known hypothesis that modern financial markets display “considerable micro efficiency” while retaining potentially large “macro inefficiency.”

D. Summing Up

The growth of asset management has brought many benefits, including most notably increased household participation in the stock market. One can make a fairly convincing case that, despite high fees, society is better off because of professional asset management. However, on the margin, there is likely too much active management and the fees are too high.

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3. The Growth of Credit Intermediation

A. Components of Growth

Table 1 shows that value added from credit intermediation grew from 2.6% of GDP in 1980 to 3.4% in 2007, having peaked at 4.1% of GDP in 2003. Growth of credit intermediation comprised roughly one quarter of the growth in the financial sector -- less than the growth of the securities industry and about equal to that of the insurance industry.

There are three broad components of credit intermediation output as measured in the national income accounts. The first is the imputed output from lending, measured as the difference between the interest earned on bank loans and the interest that would have been earned, had the funds been invested in Treasury and Agency securities (using the average interest rate earned on banks’ holdings of these securities), i.e., Lending Output = Bank Loans x (Interest Rate on Loans – Interest Rate on Treasury and Agency Securities). This measure 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, it overstates the value of these services to the extent that it also includes the credit risk premium that banks (or any other investor) earn by holding risky loans.\(^\text{10}\) And the measure is confounded by the fact that the maturity of bank loans may differ from the maturity of Treasury and Agency securities.

The second component of output, the imputed output from deposit-taking, is measured as the quantity of deposits multiplied by difference between the rate earned on Treasury and Agency securities and the rate paid on those deposits, i.e., Deposit Services Output = Deposits x

(Treasury Interest Rate – Average Interest Rate Paid to Depositors). Depositors accept yields below those of Treasuries and Agencies because they use deposits for transactional purposes.

The sum of imputed output from lending and imputed output from deposit-taking can be thought of as the net revenues collected for “traditional banking”; we show it for the years 1997, 2002, and 2007 on the first line of Table 3. The table shows that traditional banking remained roughly flat as a percentage of GDP.

The third category of output from credit intermediation includes the fees associated with loan origination, credit card accounts, deposit accounts, and other banking services. Collectively, these fees grew more than revenues from traditional banking, rising from about 2.2% of GDP in 1997 to 3.5% of GDP in 2007. The biggest increase was in origination fees on residential mortgages. In 2002, during the largest mortgage-refinancing wave in U.S history, these fees totaled $76.8 billion -- 0.7% of GDP, or 2.7% of the $2.8 trillion of residential mortgages being issued in that year.

As in the previous section, we now pan back to 1980, forming our own estimates of the sector’s outputs. These can be seen in Figure 6. To determine the output, we follow the BEA’s methodology and use data from the FDIC Call Reports.\(^{11}\) As a consistency check, we verify that we can replicate total output numbers in the Census years (every five years starting in 1982).\(^{12}\)

As can be seen from Figure 6, the imputed output from lending as a share of GDP has fluctuated around its mean of 1.2% of GDP. Much of the variation comes from changes in the

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\(^{11}\) See Ashcraft and Steindel (2008) and Alon, Fernald, Inklaar, and Wang (2011) for additional discussion of the BEA’s methodology, which we present in simplified form.

\(^{12}\) 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 FDICs Historical Statistics on Banking.
ratio of bank loans to GDP, which fell from about 60% at the end of the 1980s to under 50% at the end of 1990s. During the housing boom in the 2000-2006 period, bank loans rose back to about 60% of GDP.

Figure 6 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% at the beginning of the 1980s to under 50% in the early 2000s. This decline mostly reflects a shift of saving into money market funds, bond funds, and the stock market.

One difficulty with the treatment of credit intermediation in the national income accounts is that if a loan is securitized, the interest rate spread does not count towards national output, even though securitized credit is intermediated and some of the output is captured by the fees that banks charge on securitized loans. But given the growth of securitization during this period, this approach could significantly understate the extent of intermediation activity. If instead we count asset-backed securities towards intermediation and assign it the same spread as on other loans, we estimate that imputed output from lending would have been approximately 0.8 percentage points higher in 2007. This is shown as a dashed line in Figure 6. Of course, this measure of intermediation has the same limitations discussed above for loans held in bank portfolios.

Thus, traditional banking -- the process by which banks take deposits and originate loans to hold them on their balance sheets -- has declined slightly as a share of GDP. In fact, as can

---

13 Specifically, we assume that the ratio of deposits to loans on is the same as it was for loans that are actually on the banks’ balance sheets.

14 There were also significant changes in who was providing traditional banking services. In 1980, approximately 34% of total imputed banking services could be attributed to savings and loan institutions and credit unions. By 2007, these institutions provided less than 20% of these services. The composition of entities engaged in lending
be seen in Figure 6, essentially all of the growth in the credit intermediation industry has come from fee income, largely fees that are associated with consumer and mortgage credit. As shown in Figure 7, a good deal of these loans and associated fees come from refinancing of existing mortgages. Moreover, as shown in Figure 8 much of the variation in the industry’s overall value added comes from variation in mortgage origination. And if we strip out origination fees, the remaining credit-related activities are virtually flat as a percentage of GDP for the entire 1980-2007 period.

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

Even though traditional banking declined, corporate and household credit rose as a share of GDP from 1980-2007, as shown in Figure 9. Overall corporate credit grew from 31% of GDP in 1980 to 50% in 2007, while corporate loans on bank balance sheets fell slightly from 14% of GDP in 1980 to 11% in 2007. Household credit, mainly mortgage debt, grew more dramatically - from 48% of GDP in 1980 to 99%, with the steepest rise occurring during the housing boom of 2000-2006.

Despite this growth, banks held roughly the same share of GDP in the form of household credit (approximately 40%) at the beginning and end of the period. All of the incremental growth in credit as a share of GDP came from securitization. Indeed, by 1995, more than half of all single-family mortgages, and a sizeable share of commercial mortgages and consumer credit were securitized.

changed dramatically over this time, with financial firms specialized in originating securities to distribute them gaining increasing share.

15 In 2003, a boom year for refinancing in response to steep declines in interest rates, we estimate from that fees on refinanced mortgages accounted for 0.7% of GDP. To arrive at this number, we use HMDA data for 2003 to calculate the share of refinancing out of total originations, and multiply it by our estimate of total residential mortgage origination fees.
Securitization went hand-in-hand with the development 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). Poszar, 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 they are not banks and thus cannot issue insured deposits, and cannot access 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 (ABS) and are funded with short-term asset-backed commercial paper (ABCP). Money market funds are also shadow banks; they issue short-term claims and hold somewhat longer-term securities. And the GSEs hold mortgages and mortgage-backed securities (MBS) and are funded, in part, by issuing short-term debt instruments. Figure 10 shows that over time 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 coincided with the increasing share of loans that were securitized. As we will discuss, the increased reliance on short-term funding may play an economic role in credit intermediation but it also made the financial system significantly less stable.

Importantly, shadow banks don’t operate in isolation, but rather are connected to each other in the credit intermediation process. For example, money market funds hold ABCP, which itself holds ABS comprised of loans that are sometimes guaranteed by other entities. Poszar et. al. (2010) provide a “map” of the shadow banking system showing how all the various entities are related to each other. Thus, one of the consequences of the development of shadow banking
is that the number of steps in the credit intermediation process has lengthened; there are now more “links” in the “credit intermediation chain.” This change is important because the lengthening of the chain may bring with it an increase in financial system fragility, as we will further discuss below.

For now, we attempt to measure the lengthening of chain using a simple summary statistic, which we call the *credit intermediation index*. This measure is an attempt to estimate the average number of steps a dollar takes as it passes from the original lender of funds to the final end-user of funds, using data from the *Flow of Funds* accounts. For example, when a household makes a direct loan to a business, we call this direct finance and say that it takes one step. If households deposit funds in banks, which then make loans directly to business, there are two intermediation steps. More broadly, one can show that 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 corporate 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. We call this ratio the Credit Intermediation Index, or *CII* for short i.e., $CII = \frac{\text{Total Liabilities of All Sectors}}{\text{Total End User Liabilities}}$. Financial sector liabilities include the liabilities of the banking sector -- deposits, commercial paper, long-term debt and gross repo (i.e. agreements to repurchase securities, which are effectively secured loans). Also included are money market fund assets, debt of the GSEs, GSE mortgage pools, ABS, and pension fund and mutual funds investments in credit instruments.\(^\text{16}\)

\(^{16}\) Note that 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. GSE mortgage pools for example receive a credit guarantee from the GSEs. Other ABS require servicers and collateral managers to make payments to
As constructed, the credit intermediation index understates both the level and the growth of the length of the credit intermediation chain. First, this is because it relies on the Flow of Funds data that is aggregated at the sector level, and thus omits intra-sector intermediation activity. Second, our measure ignores approximately $15 trillion of credit derivatives contracts. Third, our measure understates the gross size of the so-called repo market. Fourth, we do not measure key steps in the credit intermediation chain such as origination by mortgage brokers and mortgage insurance.

Despite these limitations, Figure 10 shows that CII captures the increasing number of steps involved in credit creation, with most of the increase occurring during the 1990s. CII peaks at 2.26 in 2007. This increase is related to the growth of securitization because most ABS are held by financial intermediaries rather than directly by households. For example, in 2007 approximately 73% of outstanding MBS were held by financial intermediaries, including commercial banks (15%), GSEs (16%), and mutual funds (11%). These intermediaries, in turn, often fund their purchases of MBS with debt, which lengthens the credit intermediation chain.

The details of the construction of CII are shown in Table 4. We show gross credit, in trillions of dollars. The next two columns show net credit, which includes private credit (households, nonfinancial firms, and farms) and public credit (state, local, and federal bondholders, deal with defaulted loans, ensure that covenants are not violated, and in some cases move collateral in and out of the securitization vehicle.

While we have a measure of the gross level of repo outstanding of banks and broker-dealers, they also make repo loans to others which are not reflected in our repo estimate. Some of this takes the form of re-hypothecation of collateral (Singh and Aitken, 2010) in which lenders who receive collateral as security for a loan they make can turn around and use that collateral to raise secured financing for themselves. Singh and Aitken define re-hypothecation as “the practice that allows collateral posted by one party to a prime broker to be used again as collateral by that prime broker for its own funding.”

Even if banks do not hold ABS, they may fund the purchase of ABS 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.
government borrowing). The difference between net credit and gross credit is driven by the growth of financial sector liabilities, which are broken out individually in the right nine columns of the table. As can be seen, deposits are an important but declining source of funding for the financial sector; the ratio of deposits to net credit falls from approximately 40% in 1980 to about 24% in 2007. Deposits are only partly replaced by direct bank borrowing (3.3% to 4.9%). The instruments that experienced the largest growth are ABS (from zero to 12.9% of net credit), GSE borrowing (from 3.6% to 8.3% of net credit), GSE pools (from 2.5% to 12.7% of net credit). Many of these securities are in turn held by money market funds, which grow from 1.7% to 8.6% of net credit). Repurchase agreements grow from 5.9% to 15.4% of net credit.

To summarize, the last thirty years was marked by the rapid expansion of household credit, which was funded to a significant degree through the development and growth of the shadow banking system. Thus, in assessing these changes in the financial system it is important to assess both changes in the way credit was delivered as well as the incremental value of the credit that was delivered.

C. Assessment of Changes in the Machinery of Credit Delivery

The advent of shadow banking changed the machinery of credit delivery. What this new machinery produced was, for the most part, more household credit. Before asking whether shadow banking is a good way to deliver this credit, we need to ask whether increasing household credit was in and of itself desirable.

Household credit plays an important role in enabling households to smooth consumption and fund investments in education and the like. Thus, on its face, lowering the cost of credit and increasing its availability would appear to be worthwhile. However, at least three considerations give us pause in reaching the conclusion, particularly with respect to mortgage credit. First, the
mortgage interest deduction in the U.S. tax code already creates incentives for over-investment in residential real estate. Increasing the availability of mortgage credit exacerbates the over-investment in housing. Second, in areas with relatively fixed supply of land, the lower cost of credit just gets capitalized into house prices.\footnote{Mian and Sufi (2009) show that ZIP codes that experienced a greater increase in the availability of subprime credit saw large increase in housing values. Adelino, Schoar and Severino (2011) show that buyers pay more for home they can finance with mortgages that qualify for GSE guarantees.} Third, too much mortgage debt could make the economy more fragile. Lamont and Stein (1999) show that leverage leads to higher house price volatility.

With these concerns about the value of the output of shadow banking in mind, we now turn to the question of whether the machinery of shadow banking is a good way to deliver credit. As noted above, there are three aspects of shadow banking -- securitization, the issuance of short-term claims by non-bank intermediaries, and the lengthening of the credit intermediation chain -- that need to be considered. We consider each of these in turn.

(i) \textit{Securitization}

The standard rationale for securitization is that it allows banks to transfer local credit risk, particularly local mortgage credit risk, to geographically diversified lenders or guarantors. By reducing their exposure to local shocks, banks should be more willing to extend credit in other areas such as small business loans, which are less easily securitized. These forces serve to decouple deposit growth and loan growth, and they help explain the growth of the stand-alone mortgage origination business since the 1980s. Viewed from this perspective, banks’ ability to diversify benefitted homebuyers looking to access cheaper sources of capital.
Securitization of long-term fixed-rate mortgages also provides a convenient way for banks to reduce their exposure to interest rate and duration risk. And, by creating relatively homogenous securities that eliminate credit risk to the investor through government guarantees, the securities themselves became highly liquid. In principle, at least part of this liquidity premium should be passed through to mortgage originators and borrowers.

A competing view of securitization is that a large part of the growth of securitization was the result of regulatory arbitrage. In particular, securitization relies heavily on the ratings of the three main ratings agencies, S&P, Moody’s and Fitch. Bank capital regulations allowed banks to hold less capital against asset-backed securities than against the very same type of loan that would have been on their balance sheets.\(^{20}\) And, if asset-backed securities were held outside of banks, investors were required to hold even less capital. This apparent ratings arbitrage was worsened by the ratings agencies’ failure to appreciate the underlying risks in securitized products (Coval, Jurek, and Stafford 2009).

Which of these rationales for securitization – financing efficiency or regulatory arbitrage – better explains its growth remains something of an open question. Nevertheless, the financial crisis does raise questions about assumptions underlying the efficient financing view of securitization. For one, the benefits of geographic diversification proved less valuable than previously thought given the high correlation of default rates across the country and consolidation in the banking sector. Moreover, while shadow banking was supposed to distribute

\(^{20}\) In particular, while banks had to hold 4% Tier 1 capital against mortgages on their balance sheets they only had to hold 1.6% capital against GSE MBS given that they were not bearing any credit risk. Importantly, the GSEs only had to hold 0.45% of capital to guarantee the same loans, meaning that they system as a whole only had to hold 2.05% capital on loans in these mortgage pools, about half the amount that had to be held by banks for loans on their balance sheets.
risks among market participants, in practice the financial crisis revealed that the risks were concentrated in large, leveraged financial institutions.

(ii) Issuance of Short-Term Claims by Non-Bank Financial Intermediaries

Although the high leverage of many financial intermediaries was a problem in the financial crisis of 2007-9, it was their reliance on short-term funding that was a major accelerant of the difficulties, leading in some case to panic-driven runs. The first signs of trouble were in the ABCP market in the summer of 2007. When concerns about subprime mortgages surfaced, holders of these securities were reluctant to roll over their funding. This led a number of large bank issuers to buy the ABCP themselves (Acharya, Schnabl and Suarez, 2009). This, in turn, put stresses on these banks to fund the assets that they had purchased. When the crisis heightened in 2008, the initial reluctance to roll over short-term paper issued by financial institutions morphed into panicked selling. For example, there were large and precipitous withdrawals from money market funds, which in turn were large holders of short-term instruments issued by financial intermediaries. The withdrawal from these money market funds made it more difficult for intermediaries to finance themselves, putting further strain on the financial system, and precipitating government intervention. Indeed, as Ricks (2012) has convincingly shown, almost all of the many government interventions in the financial system were targeted at stabilizing the short-term instruments issued by bank and non-bank financial entities.

Thus, in assessing the development of the shadow banking system it is important to recognize that an important cost of the system is that it is funded with short-term instruments without the oversight and support usually associated with conventional banks. This makes the financial system much more vulnerable. At the same time, these costs must be weighed against
the potential value provided by these short-term claims. Dang, Gorton and Holmström (2009) and Gorton and Metrick (2010), and Ricks (2012) argue that these short-term claims serve a “money-like” role that facilitates financial transactions. A more skeptical appraisal is that the short-term claims were themselves a form of regulatory arbitrage. Deposits require banks to hold capital and reserves while ABCP requires much less capital, and money market funds require no capital. Sunderam (2012) presents evidence consistent with the view that the growth of short-term financial claims was driven by a mixture of increase in demand for money-like claims and an increase in supply of such claims, perhaps due to regulatory arbitrage.

(iii) Lengthening of the Credit Intermediation Chain

As shown above, high leverage, combined with greater reliance on short-term funding was also associated with an increase in the length of the credit intermediation chain. The costs of a long chain were evident in the financial crisis. The linkages between market actors made it difficult for them to understand their risk exposures and exacerbated run-like behavior during the crisis. And, the longer is the chain, the higher is the risk that any one link will break. Fear of this happening constitutes a form of fragility.

Is there any value to having a longer credit intermediation chain? In principle, it allows for greater specialization, which can be efficient. And, a longer chain is associated with a more liquid market. Since investors value liquidity they are willing to pay for it and borrowers presumably benefit. For example, GSE-guaranteed mortgage backed securities, because they are free of credit risk, are more liquid than an individual mortgage. Because it is more liquid, it is easier to borrow against it.
5. Conclusions

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

Our overall assessment comes in two parts. First, a large part of the growth of modern finance is from growth in asset management. This has brought many benefits including, most notably, increased diversification and household participation in the stock market. This has likely lowered required rates of return on risky securities, increased valuations, and lowered the cost of capital to corporations. The biggest beneficiaries were likely young, entrepreneurial firms that benefit the most when discount rates fall. On the other hand, the enormous growth of asset management after 1997 was driven by high fee alternative investments, with little direct evidence of much social benefit, and potentially large distortions in the allocation of talent. On net, society is likely better off because of active asset management but, on the margin, society would be better off still if there were less, high-cost active management.

Second, changes in the machinery of credit delivery allowed the expansion of household credit, mainly in the form of residential mortgages. With this expansion, came a significant increase in fees earned by the financial sector. We raise concerns about the value of the expansion in household credit and about the fragility of the shadow banking system that facilitated this expansion.
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Appendix: Using the Industry Accounts to Understand Finance Sector Output

In the BEA industry accounts, economic activity is classified along two different dimensions—by the type of good or activity produced, and by the type of firm (the Industry) producing a given good. For example, “Financial planning and investment management products” is an activity that is primarily produced by the Securities Industry. However, a small fraction of “Financial planning and investment management products” outputs are produced by the Banking Industry as a so-called “by-product.” Output of an industry can be then classified into “primary” output and “by-products.”

The valued added of the “Securities Industry” means the value added of firms mainly producing securities-related output. To calculate it, we start with total output (revenues) of all securities activities. This total output this includes securities output produced by other types of firms, so-called “other industry make.” And, this total output does not include by-products of firms in the Securities Industry. To get industry value added, we compute:

\[
\text{Value Added of the Industry} = \text{Activity Output} + \text{By-Products} - \text{Other Industry Make} - \text{Industry Inputs}.
\]

We are also interested in the value added associated with an activity rather than the associated industry. This is not reported directly by the BEA, but we can calculate it as follows:

\[
\text{Value Added of an Activity} = \text{Activity Output} - \text{Activity Inputs}.
\]

We approximate activity inputs by adjusting industry inputs by their primary output share.
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 Financial Assets

Notes: Data are from the *Flow of Funds Accounts of the United States*. Financial assets are summed across all sectors.
Figure 3. The Growth of Financial Services in Different Countries. 1990-2006

Notes: Annual data on financial services as a share of GDP are collected from the OECD and a variety of national sources. Panel A plots, for each country, the financial services share in 1990 and the financial services share in 2006. Panel B plots the difference between the financial services share in 2006 and the financial services share in 1990 (y-axis) against the financial services share in 1990 (x-axis).
Figure 4. 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.

Panel A. Major outputs of the industry

Panel B. Decomposition of Alternative Investments
Figure 5
Tradable Assets and Securities Industry Output

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

Panel A. Tradable assets and securities industry output

Panel B. S&P 500 Market-to-book and market value of equities to GDP

Panel C. Ratio of Securities Industry Output to Tradeable Assets
Figure 6. 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 7. Mortgage Origination

Source: Mortgage Bankers Association and US Department of Housing and Urban Development.
Figure 8. Credit Intermediation and Mortgage Originations

Notes: Mortgage originations are from the US Department of Housing and Urban Development. We assume an origination fee of 2.7 percent on the face value of the loan. This is approximately the sum of origination costs and secondary markup, according to data from Mortgage Bankers Association.
Figure 9. Household Credit, Corporate Credit, and Securitization

Sources: Data are from the Flow of Funds Accounts of the United States. Household credit are listed in Table L1, Credit Market Debt Outstanding. The household credit securitization share is the fraction of household credit held in securitized form.
Figure 10. 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 11. 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 from Financial Services Sector

Notes: We merge securities, funds, and trusts. Our merge accounts for the fact that funds and trusts is an input securities. The original source of the data is the Bureau of Economic Analysis.

<table>
<thead>
<tr>
<th>Year</th>
<th>All Finance</th>
<th>Credit Intermediation</th>
<th>Insurance</th>
<th>Securities</th>
<th>All Finance</th>
<th>Credit Intermediation</th>
<th>Insurance</th>
<th>Securities</th>
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<td>138 4.9%</td>
<td>73 2.6%</td>
<td>54 1.9%</td>
<td>11 0.4%</td>
<td>264 9.5%</td>
<td>110 4.0%</td>
<td>129 4.6%</td>
<td>25 0.9%</td>
</tr>
<tr>
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<td>155 5.0%</td>
<td>81 2.6%</td>
<td>60 1.9%</td>
<td>14 0.4%</td>
<td>296 9.5%</td>
<td>122 3.9%</td>
<td>145 4.6%</td>
<td>28 0.9%</td>
</tr>
<tr>
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<td>168 5.2%</td>
<td>84 2.6%</td>
<td>69 2.1%</td>
<td>15 0.5%</td>
<td>325 10.0%</td>
<td>127 3.9%</td>
<td>165 5.1%</td>
<td>32 1.0%</td>
</tr>
<tr>
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<td>194 5.5%</td>
<td>99 2.8%</td>
<td>71 2.0%</td>
<td>25 0.7%</td>
<td>364 10.3%</td>
<td>149 4.2%</td>
<td>169 4.8%</td>
<td>45 1.3%</td>
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<td>106 2.7%</td>
<td>82 2.1%</td>
<td>26 0.7%</td>
<td>405 10.3%</td>
<td>160 4.1%</td>
<td>197 5.0%</td>
<td>48 1.2%</td>
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<tr>
<td>1985</td>
<td>233 5.5%</td>
<td>119 2.8%</td>
<td>81 1.9%</td>
<td>33 0.8%</td>
<td>434 10.3%</td>
<td>180 4.3%</td>
<td>195 4.6%</td>
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<tr>
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<td>37 0.8%</td>
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<td>509 10.7%</td>
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<td>196 4.1%</td>
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<td>152 3.0%</td>
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<td>50 1.0%</td>
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<td>110 2.0%</td>
<td>52 1.0%</td>
<td>574 10.5%</td>
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</tr>
<tr>
<td>1990</td>
<td>347 6.0%</td>
<td>172 3.0%</td>
<td>124 2.1%</td>
<td>51 0.9%</td>
<td>596 10.3%</td>
<td>254 4.4%</td>
<td>257 4.4%</td>
<td>85 1.5%</td>
</tr>
<tr>
<td>1991</td>
<td>382 6.4%</td>
<td>190 3.2%</td>
<td>137 2.3%</td>
<td>55 0.9%</td>
<td>629 10.5%</td>
<td>267 4.5%</td>
<td>268 4.5%</td>
<td>94 1.6%</td>
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<tr>
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<td>414 6.5%</td>
<td>203 3.2%</td>
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<td>663 10.5%</td>
<td>282 4.4%</td>
<td>280 4.4%</td>
<td>101 1.6%</td>
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<tr>
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<td>441 6.6%</td>
<td>211 3.2%</td>
<td>155 2.3%</td>
<td>75 1.1%</td>
<td>728 10.9%</td>
<td>303 4.5%</td>
<td>302 4.5%</td>
<td>123 1.9%</td>
</tr>
<tr>
<td>1994</td>
<td>456 6.4%</td>
<td>216 3.0%</td>
<td>169 2.4%</td>
<td>71 1.0%</td>
<td>766 10.8%</td>
<td>321 4.5%</td>
<td>324 4.6%</td>
<td>121 1.7%</td>
</tr>
<tr>
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<td>490 6.6%</td>
<td>220 3.0%</td>
<td>185 2.5%</td>
<td>84 1.1%</td>
<td>830 11.2%</td>
<td>347 4.7%</td>
<td>333 4.5%</td>
<td>150 2.0%</td>
</tr>
<tr>
<td>1996</td>
<td>527 6.7%</td>
<td>231 2.9%</td>
<td>190 2.4%</td>
<td>106 1.4%</td>
<td>910 11.6%</td>
<td>386 4.9%</td>
<td>339 4.3%</td>
<td>185 2.4%</td>
</tr>
<tr>
<td>1997</td>
<td>582 7.0%</td>
<td>248 3.0%</td>
<td>206 2.5%</td>
<td>128 1.5%</td>
<td>1000 12.0%</td>
<td>429 5.1%</td>
<td>353 4.2%</td>
<td>218 2.6%</td>
</tr>
<tr>
<td>1998</td>
<td>635 7.2%</td>
<td>277 3.2%</td>
<td>228 2.6%</td>
<td>129 1.5%</td>
<td>1104 12.6%</td>
<td>469 5.3%</td>
<td>378 4.3%</td>
<td>256 2.9%</td>
</tr>
<tr>
<td>1999</td>
<td>682 7.3%</td>
<td>314 3.4%</td>
<td>230 2.5%</td>
<td>138 1.5%</td>
<td>1227 13.1%</td>
<td>520 5.6%</td>
<td>398 4.3%</td>
<td>309 3.3%</td>
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<tr>
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<td>762 7.7%</td>
<td>338 3.4%</td>
<td>274 2.8%</td>
<td>150 1.5%</td>
<td>1378 13.8%</td>
<td>561 5.6%</td>
<td>432 4.3%</td>
<td>385 3.9%</td>
</tr>
<tr>
<td>2001</td>
<td>839 8.2%</td>
<td>377 3.7%</td>
<td>260 2.5%</td>
<td>202 2.0%</td>
<td>1405 13.7%</td>
<td>614 6.0%</td>
<td>451 4.4%</td>
<td>341 3.3%</td>
</tr>
<tr>
<td>2002</td>
<td>864 8.1%</td>
<td>436 4.1%</td>
<td>249 2.3%</td>
<td>179 1.7%</td>
<td>1458 13.7%</td>
<td>676 6.4%</td>
<td>471 4.4%</td>
<td>311 2.9%</td>
</tr>
<tr>
<td>2003</td>
<td>903 8.1%</td>
<td>462 4.1%</td>
<td>273 2.5%</td>
<td>169 1.5%</td>
<td>1573 14.1%</td>
<td>729 6.5%</td>
<td>512 4.6%</td>
<td>332 3.0%</td>
</tr>
<tr>
<td>2004</td>
<td>929 7.8%</td>
<td>433 3.7%</td>
<td>320 2.7%</td>
<td>176 1.5%</td>
<td>1697 14.3%</td>
<td>760 6.4%</td>
<td>561 4.7%</td>
<td>376 3.2%</td>
</tr>
<tr>
<td>2005</td>
<td>1,029 8.1%</td>
<td>471 3.7%</td>
<td>338 2.7%</td>
<td>220 1.7%</td>
<td>1889 14.9%</td>
<td>835 6.6%</td>
<td>600 4.8%</td>
<td>454 3.6%</td>
</tr>
<tr>
<td>2006</td>
<td>1,106 8.3%</td>
<td>484 3.6%</td>
<td>367 2.7%</td>
<td>255 1.9%</td>
<td>2067 15.4%</td>
<td>890 6.6%</td>
<td>624 4.7%</td>
<td>554 4.1%</td>
</tr>
<tr>
<td>2007</td>
<td>1,110 7.9%</td>
<td>477 3.4%</td>
<td>392 2.8%</td>
<td>241 1.7%</td>
<td>2199 15.6%</td>
<td>932 6.6%</td>
<td>661 4.7%</td>
<td>606 4.3%</td>
</tr>
</tbody>
</table>

\[\Delta 1980-2007\] 973 3.0% 404 0.8% 339 0.9% 230 1.3% 1,934 6.1% 822 2.6% 532 0.1% 581 3.4%
Table 2: Value Added and Output from the Securities Industry, 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 include 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.

<table>
<thead>
<tr>
<th>Activity</th>
<th>$ billions</th>
<th></th>
<th></th>
<th>% of GDP</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Asset Management</td>
<td>82.8</td>
<td>199.2</td>
<td>341.9</td>
<td>0.99%</td>
<td>1.87%</td>
<td>2.43%</td>
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<tr>
<td>Fees and commissions from trading equities</td>
<td>55.6</td>
<td>57</td>
<td>74.1</td>
<td>0.67%</td>
<td>0.54%</td>
<td>0.53%</td>
<td></td>
</tr>
<tr>
<td>Trading gains</td>
<td>33.8</td>
<td>19</td>
<td>45.1</td>
<td>0.41%</td>
<td>0.18%</td>
<td>0.32%</td>
<td></td>
</tr>
<tr>
<td>Profits from derivative contracts</td>
<td>16.3</td>
<td>45.3</td>
<td></td>
<td>0.15%</td>
<td>0.32%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Securities origination</td>
<td>28.3</td>
<td>22.1</td>
<td>35.1</td>
<td>0.34%</td>
<td>0.21%</td>
<td>0.25%</td>
<td></td>
</tr>
<tr>
<td>Brokering and dealing debt products - debt instruments</td>
<td>36.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.26%</td>
<td></td>
</tr>
<tr>
<td>Other broker-dealer revenue</td>
<td>18.4</td>
<td>40.6</td>
<td>56.2</td>
<td>0.22%</td>
<td>0.38%</td>
<td>0.40%</td>
<td></td>
</tr>
<tr>
<td>Management of financial market and clearing products</td>
<td>22.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.16%</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>2.6</td>
<td>1.7</td>
<td>19.0</td>
<td>0.03%</td>
<td>0.02%</td>
<td>0.14%</td>
<td></td>
</tr>
<tr>
<td><strong>Total Securities Outputs</strong></td>
<td>221.5</td>
<td>355.9</td>
<td>676.1</td>
<td>2.66%</td>
<td>3.34%</td>
<td>4.81%</td>
<td></td>
</tr>
<tr>
<td>By-Products</td>
<td>5.5</td>
<td>7.6</td>
<td>11.7</td>
<td>0.07%</td>
<td>0.07%</td>
<td>0.08%</td>
<td></td>
</tr>
<tr>
<td><strong>Total Inputs</strong></td>
<td>89.4</td>
<td>131.8</td>
<td>364.6</td>
<td>1.07%</td>
<td>1.24%</td>
<td>2.59%</td>
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</tr>
<tr>
<td>Other industry make</td>
<td>9.4</td>
<td>52.8</td>
<td>82.1</td>
<td>0.11%</td>
<td>0.50%</td>
<td>0.58%</td>
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</tr>
<tr>
<td><strong>Value Added by Industry (All Value Added by Securities Firms)</strong></td>
<td>128.1</td>
<td>179.0</td>
<td>241.2</td>
<td>1.54%</td>
<td>1.68%</td>
<td>1.72%</td>
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<tr>
<td><strong>Value Added (All Securities-related Activities)</strong></td>
<td>129.2</td>
<td>206.4</td>
<td>284.0</td>
<td>1.55%</td>
<td>1.94%</td>
<td>2.02%</td>
<td></td>
</tr>
</tbody>
</table>
Table 3: Value Added and Output from Credit Intermediation, selected years

*Source:* Bureau of Economic Analysis, Economic Census of the United States, and Authors’ estimates.

<table>
<thead>
<tr>
<th>Activity</th>
<th>$ billions</th>
<th>% of GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imputed gross output of commercial banks, credit unions, and savings institutions</td>
<td>179.1</td>
<td>253.9</td>
</tr>
<tr>
<td>Service charges on deposits and cash management</td>
<td>24.7</td>
<td>57.5</td>
</tr>
<tr>
<td>Service charges and fees on credit card accounts</td>
<td>23.8</td>
<td>23.7</td>
</tr>
<tr>
<td>Other products supporting financial services</td>
<td>17.8</td>
<td>55.0</td>
</tr>
<tr>
<td>Loan origination fees, non-residential</td>
<td>14.0</td>
<td>20.2</td>
</tr>
<tr>
<td>Loan origination fees on consumer residential</td>
<td>11.3</td>
<td>76.8</td>
</tr>
<tr>
<td>ATM and electronic transaction fees</td>
<td>3.0</td>
<td>6.2</td>
</tr>
<tr>
<td>Other</td>
<td>91.5</td>
<td>88.6</td>
</tr>
<tr>
<td><strong>Total Credit Outputs</strong></td>
<td>365.2</td>
<td>582.0</td>
</tr>
<tr>
<td>By-Products</td>
<td>67.3</td>
<td>109.0</td>
</tr>
<tr>
<td><strong>Total Inputs</strong></td>
<td>180.8</td>
<td>239.9</td>
</tr>
<tr>
<td>Other Industry Make</td>
<td>3.8</td>
<td>15.2</td>
</tr>
<tr>
<td><strong>Value Added by Industry (All Value Added by Banks)</strong></td>
<td>247.9</td>
<td>436.0</td>
</tr>
<tr>
<td><strong>Value Added (All Banking-related Activities)</strong></td>
<td>211.2</td>
<td>374.7</td>
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</table>
Table 4: The Credit Intermediation Index

Notes: Data are from the Flow of Funds Accounts of the United States, 1980-2009. Net credit is from Table L1 and is defined as Domestical nonfinancial sector debt, plus trade payables. Gross credit is net credit plus financial sector credit, (Table L1) plus domestic deposits, money market mutual funds, pension and life insurance reserves, and security credit. CII is the credit intermediation index, and is the ratio of gross credit to net credit. Repo refers to security repurchase agreements.

<table>
<thead>
<tr>
<th>Year</th>
<th>CII</th>
<th>Gross Credit ($tr)</th>
<th>Net Credit ($tr)</th>
<th>Ratios to Net Credit (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Total Private Public</td>
<td>Banks Deposits ABS GSE GSE Pools MMFs Pension Funds Repo Other Fin</td>
<td></td>
</tr>
<tr>
<td>1980</td>
<td>1.83</td>
<td>8.2 4.5 3.4 1.1</td>
<td>3.3% 39.9% 0.0% 3.6% 2.5% 1.7% 17.2% 5.9% 21%</td>
<td></td>
</tr>
<tr>
<td>1981</td>
<td>1.87</td>
<td>9.3 4.9 3.7 1.2</td>
<td>3.7% 39.0% 0.0% 3.9% 2.6% 3.8% 17.7% 7.1% 21%</td>
<td></td>
</tr>
<tr>
<td>1982</td>
<td>1.89</td>
<td>10.2 5.4 4.0 1.4</td>
<td>3.8% 39.1% 0.0% 3.9% 3.3% 4.1% 18.6% 7.2% 20%</td>
<td></td>
</tr>
<tr>
<td>1983</td>
<td>1.88</td>
<td>11.3 6.0 4.4 1.6</td>
<td>3.7% 39.1% 0.1% 3.5% 4.1% 3.0% 18.6% 7.1% 19%</td>
<td></td>
</tr>
<tr>
<td>1984</td>
<td>1.88</td>
<td>12.8 6.8 5.0 1.9</td>
<td>3.9% 38.2% 0.3% 3.5% 4.2% 3.4% 18.2% 7.5% 19%</td>
<td></td>
</tr>
<tr>
<td>1985</td>
<td>1.85</td>
<td>14.6 7.9 5.6 2.3</td>
<td>3.8% 35.9% 0.5% 3.4% 4.7% 3.1% 17.0% 7.7% 19%</td>
<td></td>
</tr>
<tr>
<td>1986</td>
<td>1.88</td>
<td>16.4 8.7 6.2 2.6</td>
<td>3.8% 35.1% 0.9% 3.2% 6.1% 3.3% 17.1% 8.2% 19%</td>
<td></td>
</tr>
<tr>
<td>1987</td>
<td>1.87</td>
<td>17.8 9.5 6.7 2.8</td>
<td>4.0% 33.4% 1.2% 3.2% 7.0% 3.3% 16.9% 8.3% 19%</td>
<td></td>
</tr>
<tr>
<td>1988</td>
<td>1.87</td>
<td>19.4 10.4 7.4 3.0</td>
<td>3.9% 32.6% 1.5% 3.4% 7.2% 3.2% 17.3% 8.3% 19%</td>
<td></td>
</tr>
<tr>
<td>1989</td>
<td>1.89</td>
<td>21.1 11.1 8.0 3.1</td>
<td>3.5% 31.4% 1.9% 3.4% 7.8% 3.8% 18.4% 8.8% 19%</td>
<td></td>
</tr>
<tr>
<td>1990</td>
<td>1.88</td>
<td>22.3 11.9 8.4 3.5</td>
<td>2.8% 29.6% 2.3% 3.4% 8.6% 4.2% 18.8% 8.0% 19%</td>
<td></td>
</tr>
<tr>
<td>1991</td>
<td>1.88</td>
<td>23.3 12.4 8.5 3.9</td>
<td>2.3% 28.3% 2.6% 3.3% 9.3% 4.3% 19.1% 7.7% 20%</td>
<td></td>
</tr>
<tr>
<td>1992</td>
<td>1.89</td>
<td>24.5 13.0 8.8 4.2</td>
<td>2.2% 26.8% 3.0% 3.5% 9.8% 4.2% 19.3% 8.5% 20%</td>
<td></td>
</tr>
<tr>
<td>1993</td>
<td>1.91</td>
<td>26.0 13.6 9.1 4.5</td>
<td>2.3% 25.4% 3.4% 3.9% 10.0% 4.1% 19.7% 9.3% 22%</td>
<td></td>
</tr>
<tr>
<td>1994</td>
<td>1.92</td>
<td>27.4 14.3 9.7 4.6</td>
<td>2.4% 23.9% 3.8% 4.9% 10.3% 4.2% 20.0% 9.5% 22%</td>
<td></td>
</tr>
<tr>
<td>1995</td>
<td>1.96</td>
<td>29.6 15.1 10.4 4.7</td>
<td>2.4% 23.5% 4.4% 5.3% 10.4% 4.9% 20.4% 10.7% 24%</td>
<td></td>
</tr>
<tr>
<td>1996</td>
<td>2.00</td>
<td>31.9 16.0 11.1 4.9</td>
<td>2.5% 23.5% 4.9% 5.6% 10.7% 5.6% 20.6% 10.9% 25%</td>
<td></td>
</tr>
<tr>
<td>1997</td>
<td>2.05</td>
<td>34.5 16.9 12.0 4.9</td>
<td>2.8% 23.5% 5.4% 5.9% 10.8% 6.2% 21.3% 11.9% 27%</td>
<td></td>
</tr>
<tr>
<td>1998</td>
<td>2.10</td>
<td>37.9 18.0 13.1 4.9</td>
<td>3.3% 23.6% 6.5% 7.1% 11.2% 7.4% 21.6% 11.6% 28%</td>
<td></td>
</tr>
<tr>
<td>1999</td>
<td>2.13</td>
<td>41.3 19.3 14.5 4.8</td>
<td>3.7% 22.9% 6.9% 8.2% 11.9% 8.2% 21.6% 11.7% 29%</td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td>2.16</td>
<td>44.5 20.6 16.0 4.6</td>
<td>3.9% 22.9% 7.3% 8.9% 12.1% 8.8% 20.6% 12.6% 31%</td>
<td></td>
</tr>
<tr>
<td>2001</td>
<td>2.21</td>
<td>47.9 21.7 17.0 4.7</td>
<td>4.0% 23.9% 8.1% 9.8% 13.1% 10.3% 20.1% 12.9% 30%</td>
<td></td>
</tr>
<tr>
<td>2002</td>
<td>2.21</td>
<td>51.2 23.2 18.1 5.1</td>
<td>3.9% 23.8% 8.6% 10.1% 13.6% 9.6% 19.2% 13.3% 30%</td>
<td></td>
</tr>
<tr>
<td>2003</td>
<td>2.22</td>
<td>55.2 24.9 19.3 5.6</td>
<td>3.9% 23.9% 8.9% 10.4% 13.4% 8.1% 19.3% 13.5% 30%</td>
<td></td>
</tr>
<tr>
<td>2004</td>
<td>2.21</td>
<td>60.0 27.1 21.0 6.1</td>
<td>4.3% 24.2% 9.8% 9.9% 12.5% 6.9% 18.8% 13.8% 31%</td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td>2.19</td>
<td>65.3 29.8 23.2 6.6</td>
<td>4.3% 23.9% 11.4% 8.7% 11.9% 6.7% 17.8% 14.4% 30%</td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>2.22</td>
<td>71.8 32.4 25.5 6.9</td>
<td>4.1% 23.7% 13.0% 8.1% 11.9% 7.1% 17.5% 15.2% 31%</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>2.26</td>
<td>79.3 35.1 27.8 7.3</td>
<td>4.9% 23.6% 12.9% 8.3% 12.7% 8.6% 17.1% 15.4% 32%</td>
<td></td>
</tr>
</tbody>
</table>