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Global Markets Institute

Who pays for bank regulation?

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The Global Markets Institute is the public-policy research unit of Goldman Sachs Global Investment Research, designed to help improve public understanding of capital markets and their role in driving economic growth.

I. Who pays for bank regulation?

In the wake of the financial crisis, a wide range of new and revised rules, regulations and practices have been imposed on the US banking industry. These include measures to strengthen and raise capital, reduce leverage, improve balance sheet liquidity and bring greater standardization and transparency to derivatives markets. They also include new rules around credit card availability and debit-interchange fees, along with heightened regulatory and judicial scrutiny of bank lending and other practices.[1]

While many of these steps are designed to strengthen the safety and soundness of the banking system, they also act as a tax on banks: by changing relative prices, regulation makes some activities more expensive and others cheaper. Taxed activities become more expensive for banks to produce and for their customers to consume. As in many markets, higher costs typically reduce the amount of activity undertaken. Thus the bank tax affects the distribution of activities across different types of consumers and businesses in a way that allows clear winners and losers to emerge. This then leads to two questions: 'who ultimately bears the cost of bank regulation?' and 'what are the broader economic implications?'.

The multiplicity and complexity of post-crisis regulations complicate the process of answering these two key questions. Largely because multiple new rules affect the same activities, there is substantial uncertainty as to which rule is binding at any point in time. This makes it extremely challenging not only to assess which rule ultimately determines the cost to the end-user of bank services, but also to understand each rule's effect on the broader economy.

Economic assessments are made that much harder because the public discourse tends to be about macroeconomics, typically focusing on the impact to overall GDP or employment, or one of abstract financial theory. This macroeconomic focus leads to muddled results, because while it may be possible to estimate the initial economic impact of a new rule, there is almost always a policy response that can offset much of the aggregate effects that are visible in the macroeconomic data. The availability of these offsets transforms the public dialogue into a discussion of the ability of policy to offset the aggregate effects of regulation, rather than a discussion of the cost of each new rule itself or of who bears the cost.

A way to better understand the impact of new bank regulation is to focus on the microeconomic impact of the new rules *within* the economy, rather than *across* the economy as a whole. Looking at regulation from a microeconomic perspective shows that the cumulative impact of the new rules is more straightforward than the current public discourse might suggest.

In practice, the microeconomic cost of regulation is determined by two factors: the size of the regulatory burden and the degree to which less-regulated alternatives are accessible. As a result, consumers and businesses that have ready access to alternative sources of finance are less likely to pay the incremental tax that regulation imposes. Conversely, consumers and businesses without access to effective alternatives to bank lending are more likely to pay. This is particularly true in cases where the new rules single out certain activities as especially concerning and impose further taxes, whether in the form of higher capital charges, more stringent regulatory supervision or activity-specific legal and regulatory costs and restrictions.

While there is some added subtlety to the results of our analysis, we find in general that **low-income consumers and small businesses – which generally have fewer or less**

[1] See Appendix A for a list of new rules and regulations imposed since the crisis.

effective alternatives to bank credit – have paid the largest price for increased bank regulation. For example, for a near-minimum wage worker who has maintained some access to bank credit (and it is important to note that many have not in the wake of the financial crisis), the added annual interest expenses associated with a typical level of debt would be roughly equivalent to one week's wages. For small and mid-sized businesses the damage from increased bank regulation is even greater: their funding costs have increased 175 basis points (bp) more than those of their larger peers, when measured against the pre-crisis period. That funding cost differential is enough to seriously damage the ability of smaller firms to compete with their larger competitors. This fact has become all too evident in the economic statistics and is already changing the shape of American business, as small and mid-sized firms, the historic engines of US job creation, shrink and sometimes disappear, displaced by large corporations.

II. How to assess who pays for bank regulation

The key to assessing the impact of bank regulation within the economy is examining how its effects differ across markets. Two factors are at play. The first is the importance of bank intermediation in any particular market segment, which can be seen in the degree to which consumers and businesses can substitute away from banks for their financing needs. We term this 'banking intensity.' The second is the extent to which various bank activities have been affected by new capital charges, other regulations or heightened judicial and regulatory scrutiny.

Exhibit 1 shows the results of the analysis we have developed for measuring these factors across 12 key lending markets.[2] This is a qualitative analysis designed to capture the importance of banks to each market, the availability of alternative sources of finance and the impact of changes in regulation since 2008.

We look first at the 'banking intensity' of different credit categories, assessing the extent of banks' participation – and the availability of potential substitutes – in both the origination of credit and the holding of credit risk on banks' balance sheets. To do this we use a simple scale, assigning a zero to markets that have robust alternative sources of credit, or to those where credit is largely held off banks' balance sheets; one point to markets where banks dominate in either or both origination and credit retention; and a half point to markets where origination and risk retention are split between banks and other providers.

Next, we evaluate the degree and extent to which regulatory change has affected each market, adding an incremental half point if bank lending is affected in either of two ways:

- Capital costs are effectively higher due to increases in direct capital charges, higher risk-retention requirements or other legal or regulatory restrictions. Examples include the Basel III treatment of mortgages through operational risk and the Federal Reserve's treatment of unfunded commitments in CCAR (the annual Comprehensive Capital Analysis and Review) and its supplementary leverage ratio rule.
- Credit exposures have effectively been brought back on banks' balance sheets as banks face the imposition and enforcement of 'special representations and warranties,' along with greater legal risk. Mortgage settlements are the prime example.

[2] We focus on 12 markets, which together account for roughly $20trn of the total $27trn in non-financial, non-government debt outstanding in the US, according to the Federal Reserve.

We aggregate scores on these three measures to derive an estimate of the total exposure of each market to regulatory change. Markets with two points are most affected; markets with zero points are least affected.

Exhibit 1: Assessment of banking intensity and regulatory changes across key lending markets

	Assessment of banking intensity and regulatory change			
Lending category	**(A) Reliance on banks for origination and/or holding (0, 0.5, 1)**	**(B) Higher effective capital charges (0 or 0.5)**	**(C) Special reps and warranties or higher scrutiny (0 or 0.5)**	**Ranking (A+B+C)**
Near- and sub-prime credit card	1.0	0.5	0.5	**2.0**
Prime credit card	1.0	0.5	0.0	**1.5**
Home equity	1.0	0.5	0.0	**1.5**
Jumbo mortgage	1.0	0.0	0.5	**1.5**
Small unrated corporate loan	1.0	0.5	0.0	**1.5**
Class B commercial real estate (CRE)	1.0	0.5	0.0	**1.5**
Conforming mortgage	0.5	0.0	0.5	**1.0**
Medium unrated corporate loan	0.5	0.5	0.0	**1.0**
Auto	0.5	0.0	0.0	**0.5**
Federal Housing Administration (FHA)/ Veterans Affairs Department (VA) mortgage	0.0	0.0	0.0	**0.0**
Large investment grade corporate	0.0	0.0	0.0	**0.0**
Large high yield corporate	0.0	0.0	0.0	**0.0**

Source: Goldman Sachs Global Investment Research.

Our next step is to identify changes in lending rates, shown in Exhibit 2. We compare the prevailing interest rate in each category in 2013 against the average over 2000-2007, which we use as a non-crisis baseline.[3] To adjust for the overall level of interest rates across loan maturities, we use the relevant non-bank benchmark rates for each activity, namely US Treasuries of differing maturities. The relevant benchmarks and the proxies we use for each category of activity are laid out in Appendix B.

[3] These are prevailing market rates, not specific to any type of lender. Because we focus on relative pricing, not absolute costs, our results are largely insensitive to the choice of baseline time period.

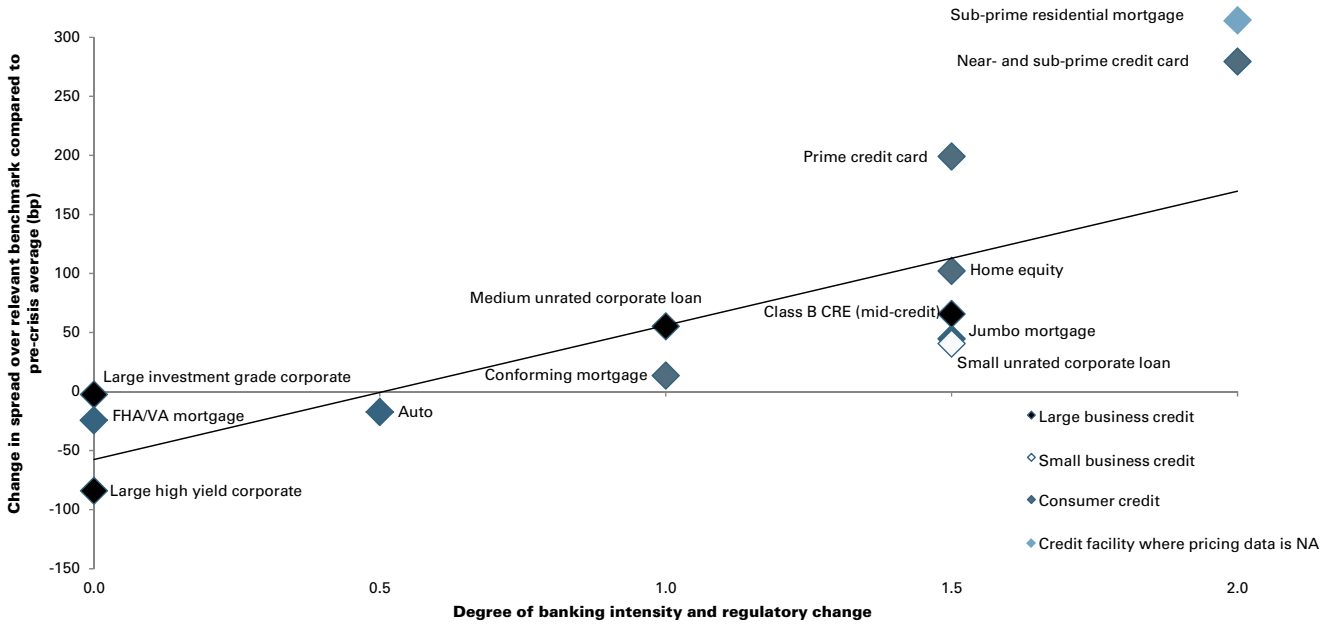
Exhibit 2: Lending rates have risen significantly for most markets compared to the 2000-2007 average
prevailing lending rates, expressed as spreads over applicable benchmark

Form of lending	Price (spread over applicable pricing benchmark)			
Loan/borrower type	**2000-2007**	**2008-2010**	**2013**	**13 vs. pre-'08 (bp)**
Credit card	10.6%	13.2%	12.8%	224 bp
Higher FICO	9.6%	10.8%	11.6%	199 bp
Lower FICO	10.3%	13.3%	13.1%	280 bp
Residential mortgage	--	--	--	--
Jumbo	1.7%	3.0%	2.1%	45 bp
Conforming	1.7%	1.9%	1.8%	14 bp
FHA/VA	1.8%	2.1%	1.6%	-24 bp
Sub-prime	--	--	--	--
Auto	3.4%	4.3%	3.3%	-17 bp
Home equity	2.7%	4.5%	3.8%	102 bp
Commercial real estate	--	--	--	--
Class A (higher-credit)	--	--	--	--
Class B (mid-credit)	1.7%	2.6%	2.3%	66 bp
Smaller CRE	--	--	--	--
Commercial & industrial	--	--	--	--
Large IG corporates	1.5%	2.7%	1.5%	-2 bp
Large HY corporates	5.5%	9.3%	4.7%	-84 bp
Medium unrated corporate	3.5%	5.6%	4.1%	55 bp
Small unrated corporate	2.4%	3.3%	2.8%	41 bp
Average	4.6%	6.1%	5.3%	68 bp

Source: Goldman Sachs Global Investment Research. See Appendix B for relevant proxies and benchmarks.

Finally, we combine these analyses to assess the impact of the regulatory tax burden by plotting the assessment of regulatory change against the change in prevailing lending rates. Exhibit 3 shows the results, which are both large and uneven across different markets. **The markets that are most exposed to regulatory change have seen lending rates rise most significantly, while the markets that are least exposed – where strong non-bank alternatives exist – have seen lending spreads fall from the pre-crisis period.**

Exhibit 3: Rates have risen most in the markets that are most exposed to regulatory change
change in prevailing lending rates, compared to pre-crisis levels, plotted against our assessment of the degree of banking intensity and regulatory change in 12 key lending markets



Source: Goldman Sachs Global Investment Research.

III. Lower-income consumers and small businesses are paying more as a result of new bank regulation

As shown in Exhibits 1 through 3, different dynamics are playing out across the consumer and corporate lending markets, reflecting differing levels of regulatory scrutiny and degrees of banking intensity. But the overall conclusion is clear: consumers and businesses with few alternative sources of finance bear a disproportionate burden of the tax from increased bank regulation.

This is true even in markets where bank regulation has changed lending dynamics for consumers of all income levels and commercial borrowers of all sizes. Consumers with savings or businesses with strong balance sheets can effectively act as their own alternative source of finance – i.e. they can choose to rely on their savings or reserves rather than borrow at excessively high rates. In contrast, consumers who lack a financial cushion have little choice but to pay the higher rates, or to cut spending. In either case, their overall consumption will be lower.

Consumer lending markets

First, consider the **automobile loan market**, which has been largely untouched by regulatory reform and which therefore provides a useful baseline to assess whether factors other than regulation have affected lending or rates. Although a considerable share of the auto financing market is served by captive finance companies, which principally fund themselves in public markets through unsecured term debt and asset-backed securities, banks also play a direct role in auto financing. We estimate that banks originate and hold

on their balance sheets roughly one-third of the total market, and accordingly assign this market a banking-intensity score of 0.5. With no significant post-crisis regulatory intervention, we do not add any incremental points. Looking at the cost of direct bank financing, which is a reasonable proxy for the overall market, we see that spreads over the benchmark have narrowed by 17bp against the pre-crisis level, making auto loans one of the few consumer markets where funding is less expensive today than prior to the crisis.

Second, in clear contrast, consider the **credit card market**, where new regulations affect consumers across the board, and where lower-income borrowers are hurt most. Credit card debt is originated almost entirely by banks, with roughly 70% of it held on banks' balance sheets, giving a banking intensity score of one to each of the three segments we look at (prime, near-prime and sub-prime). All three categories bear higher effective capital charges, for which we assign an additional half point; the near-prime and sub-prime markets have also felt the effects of heightened legal and regulatory scrutiny, for which we assign a further half point. This makes near- and sub-prime credit cards, with a total score of two points, the most affected of the 12 lending markets we discuss in this paper.

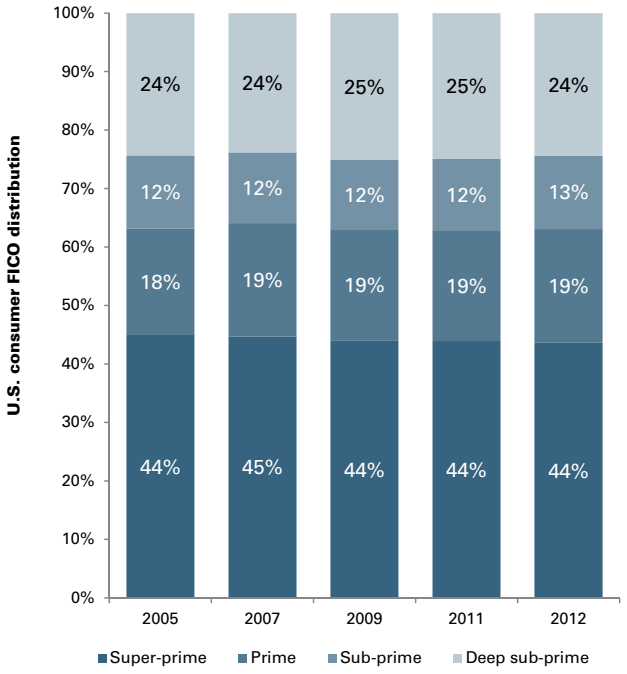
Credit card pricing and availability have been dramatically affected both by the Credit CARD Act of 2009 (the CARD Act) and, more recently, by scrutiny from the new Consumer Financial Protection Bureau. The CARD Act has notably reduced the availability of credit cards for lower-income and younger borrowers. It eliminated banks' ability to reprice credit to reflect actual delinquency. In the past, if borrowers missed payments, card companies could raise their rates to reflect the higher risk from the actual delinquency. Today, card companies are prevented from doing so, meaning that they need to charge higher rates from the outset in order to compensate for the *potential risk* that a borrower might miss a payment at some time in the future.

Exhibit 2 above illustrates the dynamics of credit card pricing in recent years, showing that lower-income borrowers have been most affected. Rates have risen significantly with spreads now at least 200bp wider than the pre-crisis period, even for prime borrowers. And the differential by FICO scores (and implicitly by income)[4] has widened most significantly, as spreads for borrowers with low FICO scores have expanded 280bp.

However, a focus on pricing obscures the fact that many would-be borrowers have been priced out of the credit card market entirely. Outstanding credit card debt is 14% lower than the pre-crisis peak, with the data strongly suggesting that lower-income borrowers have been most affected. As Exhibits 4 and 5 below show, the distribution of FICO scores has been stable since 2005, but the availability of credit cards has shifted dramatically, with upper-income households now dominating the market. In 2005, 26% of the credit extended went to sub-prime or deep sub-prime credit (FICO scores of 660 or below); this figure is just 11% today. The market is currently dominated by 'super-prime' borrowers (FICO scores of roughly 720-850), who account for 58% of the credit outstanding, up from 40% in 2005.

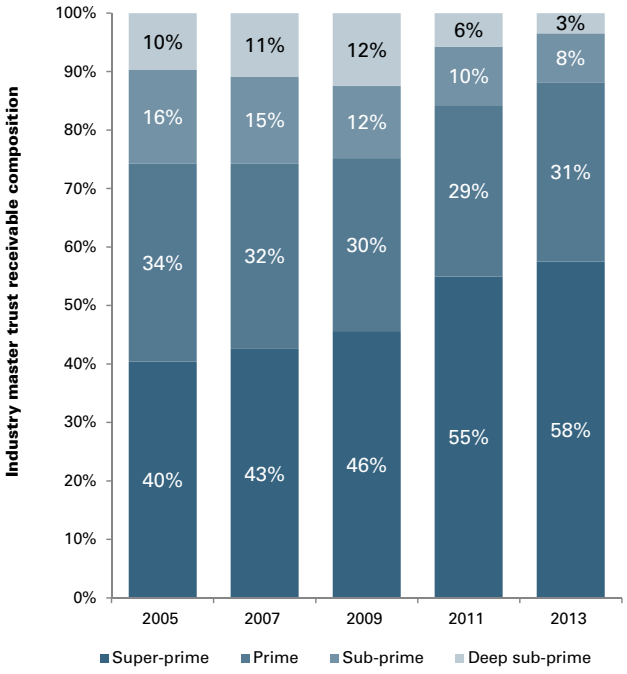
[4] Although FICO scores do not translate directly into income, a paper from the Federal Reserve Banks of Boston and Kansas City suggests that sub-prime and deep sub-prime card holders have incomes below $50,000, while super-prime card holders have incomes above $75,000. See *Effects of Credit Scores on Consumer Payment Choice*, Fumiko Hayashi and Joanna Stavins, Federal Reserve Bank of Kansas City Research Working Paper RWP 12-03, February 2012.

Exhibit 4: The distribution of FICO scores across US consumers has been relatively stable…



Source: Goldman Sachs Global Investment Research, Fair Isaac Corporation, company master trust filings. US consumer FICO distribution: super-prime (720-850), prime (660-720), sub-prime (600-660), deep sub-prime (<600).

Exhibit 5: …but the distribution of credit cards is shifting towards prime borrowers



Source: Goldman Sachs Global Investment Research, Fair Isaac Corporation, company master trust filings. US consumer FICO distribution: super-prime (720-850), prime (660-720), sub-prime (600-660), deep sub-prime (<600).

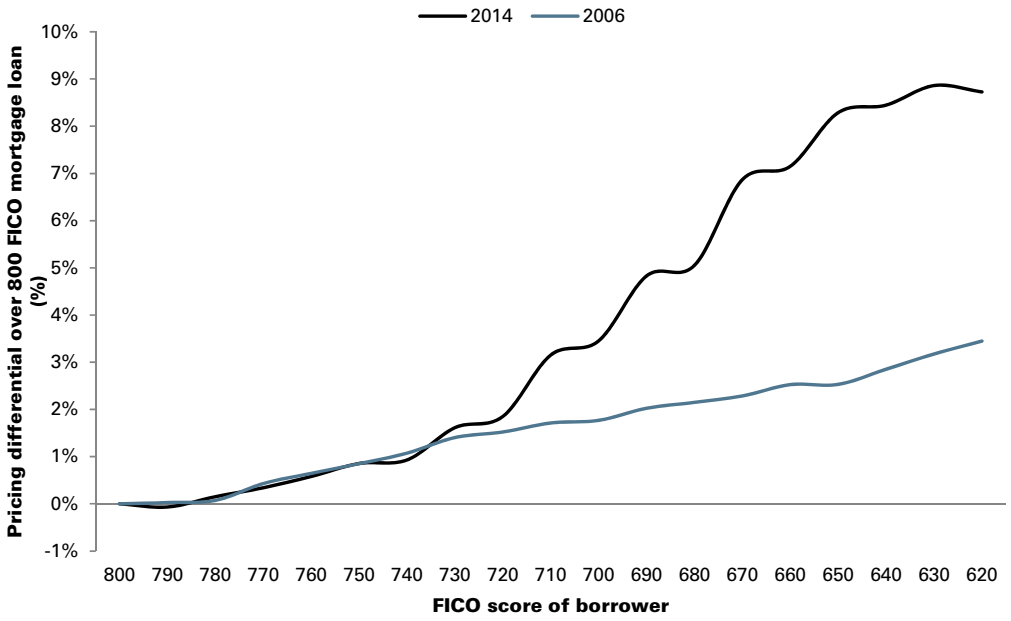
Many low-income borrowers who have been priced out of the credit card market entirely have turned to alternative sources of credit – but in this case their alternatives are payday lenders, pawnshops and other non-bank sources where borrowing costs are typically far higher. Data from US Census Bureau surveys indicate that the universe of borrowers from non-bank sources has expanded significantly during the downturn. The demographic composition of borrowers also changed, becoming increasingly older, non-minority and more educated, and with more married couples and higher-income households relying on non-bank credit as well.[5] Forty-five percent of recent users indicated in the survey that they had turned to non-bank credit to meet basic living expenses. These borrowers may be able to maintain their previous levels of consumption, but at a high cost: interest rates from non-bank lenders tend to have annual percentage rates (APRs) that run to three digits, rather than the 15%-30% rates typically seen with credit cards.

Third, consider the **conforming mortgage market**, where rates have risen and low-income borrowers may be unable to obtain credit as a result of new rules and regulations. Mortgage origination is split between banks and non-bank lenders, and mortgages are held both on banks' balance sheets and by non-bank investors. Accordingly, we assign a banking intensity score of 0.5. Mortgages are also now subject to heightened scrutiny in several forms: new rules on 'qualified mortgages' and higher risk-retention requirements for non-qualifying mortgages; heightened repurchase risk; and stricter regulatory scrutiny of pre-crisis underwriting practices. For these factors, we assign another half point.

[5] See the 2011 *FDIC National Survey of Unbanked and Underbanked Households*, http://www.fdic.gov/householdsurvey/2012_unbankedreport.pdf, as well as its 2013 addendum, http://www.fdic.gov/householdsurvey/2013_AFSAddendum_web.pdf. This report analyses data collected by the US Census Bureau in conjunction with the FDIC.

Overall, spreads for conforming mortgages have expanded 14bp since before the crisis. But this is not an across-the-board increase. Exhibit 6 shows the pricing spread between high-FICO mortgages and low-FICO mortgages. Both are conforming, government-guaranteed mortgages, meaning that there is no credit risk to the lender. Nonetheless, banks charge dramatically different rates for borrowers of different credit quality. Prior to 2008, a borrower with a FICO score of 620 paid roughly 3.5% (or 21bp in absolute terms) more than a borrower with a score of 800. Today, that differential is as much as 8.7% (or 39bp). This effectively prices many lower-credit borrowers out of the conforming mortgage market entirely.

Exhibit 6: The differential between high- and low-FICO mortgage borrowing has widened, even for government-guaranteed loans
pricing spread by borrower's FICO score over an 800 FICO mortgage loan



Source: eMBS, Goldman Sachs Global Investment Research.

In fact the **sub-prime mortgage market** has dried up almost completely since 2008, with just $4bn originated in each of the last five years, compared to $625bn in the peak year of 2005. Banks face higher risk retention requirements and capital charges for these loans, along with heightened regulatory scrutiny around pre-crisis lending practices and repurchase risk. As a result, many banks are no longer willing to participate in this market or will only do so at rates that are prohibitively expensive for borrowers.

The **jumbo mortgage market** also faces heightened regulatory scrutiny, particularly stricter standards for lenders in assessing borrowers' ability to repay. Some lenders have raised down payment requirements and others have pulled back from the business. Originations today are roughly half the 2000-2007 annual average, and spreads have expanded 45bp. Jumbo mortgages are an important segment of the market in states with higher average home prices.[6]

[6] States where more than 15% of houses are valued at more than $500,000 include California, Connecticut, Hawaii, Maryland, Massachusetts, New Jersey, New York and Virginia.

The related **home equity market** also illustrates these dynamics well. Banks are responsible for virtually all origination of home equity loans and hold roughly 85% of the risk on their balance sheets; we give this market one point on the banking intensity scale. Home equity also receives an incremental half point for special regulatory scrutiny, in the form of higher risk weights through operational risk and CCAR, and thus effectively higher capital charges, along with higher risk-retention requirements. Together, with a lack of MBS investor appetite, these factors have pushed pricing sharply higher (with spreads expanding 102bp relative to the pre-crisis average) and originations dramatically lower (roughly 20% of the pre-crisis annual average).

Bank regulation has had the effect of expanding credit availability in one segment of the market: mortgages guaranteed by the Federal Housing Administration (FHA) and Veterans Affairs Department (VA). **FHA/VA loans** are offered on flexible terms (recently made more flexible) to low- or no-credit borrowers (FHA) or to veterans (VA), and their guaranteed status gives them no repayment risk. Effectively this market has become a government-guaranteed substitute for the private sub-prime market. Not surprisingly, origination, which largely occurs within banks, has soared and is now more than two and a half times the pre-crisis average. Pricing has also improved, with spreads 24bp narrower than pre-2008 levels. These loans make up less than 20% of the total mortgage market, but they illustrate the way in which policy interventions have shifted the allocation of credit.

Exhibit 7 shows the changes in origination activity in different segments of the mortgage market.

Exhibit 7: FHA/VA loans supplant sub-prime mortgages
change in origination ($bn)

	Loans originated by banks ($bn)			
Loan/borrower type	**Average 2000-2007**	**Average 2008-2010**	**Total 2013**	**13 vs. pre-'08 (% change)**
Residential mortgage	$2,693	$1,657	$1,890	-30%
Conforming	$1,296	$1,074	$1,175	-9%
Jumbo	$482	$100	$272	-44%
Sub-prime	$341	$10	$4	-99%
FHA/VA	$138	$374	$366	164%

Source: Goldman Sachs Global Investment Research, Inside Mortgage Finance.

Corporate funding markets

Switching our focus to commercial lending, we see a clear differentiation between the larger firms that have ample access to alternative sources of funding, often at attractive rates, and the small and mid-sized firms that are much more reliant on banks and, consequently, are paying more for credit today.

Consider **commercial real estate (CRE)** lending. This is a highly bank-intensive business, to which we assign one point, along with a further half point for higher capital requirements. The volume of debt outstanding is down by more than 20% in both the Class B (non-super-prime commercial real estate) and smaller CRE markets, while spreads for the Class B market have widened by 66bp, suggesting that even those borrowers who can get credit are paying notably more.

Also observe the sharp disconnect by size within **commercial and industrial (C&I)** lending. At one end of the spectrum are the **smaller unrated corporate loans**. Because banks originate 100% of this market and hold 100% of the risk on their balance sheet, we give this market one point for banking intensity. The market gains another half point for the impact of the Basel III leverage ratio's treatment of unfunded commitments. Credit is still available,

with the total debt outstanding today 6% higher than the pre-crisis peak, but spreads have expanded by 41bp. This suggests that smaller unrated corporates continue to borrow from banks because they lack effective alternatives, but that they are paying considerably more for credit today.

The picture is slightly different in the **mid-sized unrated corporate loan market**. We assign a half point for banking intensity, given that while banks still originate close to 100% of these loans, the growing role of alternative providers from the asset management industry has driven the share of risk held on banks' balance sheets to just 19% today, down from nearly 50% prior to the crisis. We also assign an incremental half point for regulatory changes in the market, particularly CCAR treatment and new limits on leveraged lending imposed in 2013. Bank pricing in the mid-sized corporate market has expanded by 55bp, suggesting again that corporates with few alternatives to banks are paying notably more for credit today.

At the other end of the spectrum are the large corporations that can borrow in **public debt markets** – both investment grade (IG) and high yield (HY). Banks do not play a role in originating IG or HY debt, other than in underwriting, and hold less than 5% of the total market risk on their balance sheets. Not surprisingly, we assign zero points for such low banking intensity. We also do not assign incremental points for special regulatory or judicial scrutiny, because these markets have been largely unaffected by the regulatory changes aimed at banks.

Large IG and HY corporates today have access to funding at rates that are considerably more attractive than prior to the crisis. In fact, large high yield corporate debt shows the largest improvement in funding costs across the 12 markets we assess (with spreads 84bp narrower than before the crisis). Lower funding costs have not surprisingly attracted a broader range of issuers in the wake of the crisis, with some firms that had previously been reliant on bank debt shifting their funding mix towards bonds, new entrants joining the market and in some cases companies issuing public debt to pay down bank borrowings. Private placements have also provided an important source of financing for some larger corporates. However, it is important to note that public debt issuance itself carries an additional regulatory and compliance burden, meaning that it is not available for all firms. Here too, size is a key factor in determining whether firms can access the lower borrowing rates that bond markets now offer.

The strength of the public debt markets can be seen in numerous ways. Yields are at historic lows across the credit spectrum, while issuance is reaching all-time highs in both the IG and the HY markets. Firms are financing on very attractive terms, including 'covenant-lite' and payment-in-kind (PIK) deals and dividend recapitalizations. New and infrequent issuers are raising funds at rates that would have been unavailable just a few years ago. Strong inflows into these markets reflect investors' demand for yield and market resiliency, as well as the entrance of non-traditional lenders such as hedge funds and insurance companies, who are beginning to disintermediate banks.

IV. Putting the cost of new bank regulation into economic context

To put our analysis into a broader economic context, we look at the impact of lower availability and higher cost of credit across both consumer and corporate borrowers. We begin with consumers by examining the effects of new bank regulation on a household with the US median annual income of $50,000. We estimate that the higher payments associated with the types of mortgages and credit card debt this household would consume, offset by lower auto loan payments, equates to an incremental $200 in interest expenses each year.[7]

A household in the 20th-40th percentile by income, which earns $38,000 on average, fares worse. We assume it does have access to credit but note that more than 40% of these households do not. If the household does have credit, it may pay an incremental $300 each year for its mortgage and credit card debt, even considering the offsetting reduction in auto payments. This means that the relative impact is almost twice as large as it is for the median household: 80bp of annual income compared to 40bp. For a minimum-wage earner working eight hours a day, $300 is a full week's worth of work.

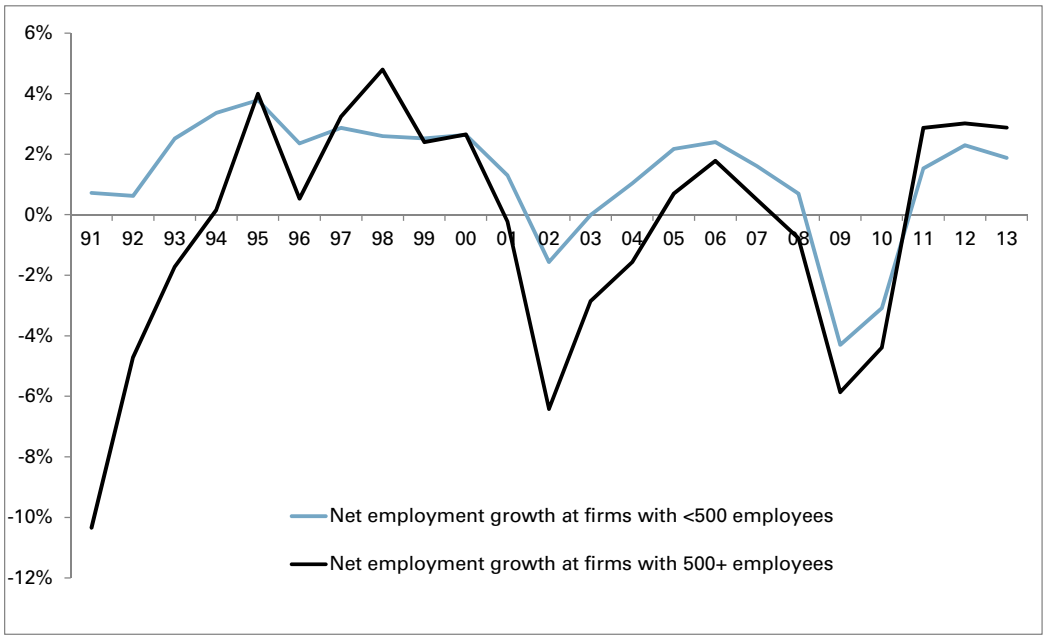
Turning to corporates, small businesses[8] tend to fund themselves through a mixture of credit card debt, bank loans and bank lines of credit. Credit cards are a principal source of funding for most small businesses, given that many have limited access to bank finance. Therefore these firms are hurt by higher credit card rates and lower availability of credit, as well as by higher borrowing rates for bank loans and lines of credit.

The actual costs of higher credit for small businesses are difficult to tabulate, given the lack of detailed data on the distribution of small firms' sources of borrowing. However, cost itself is not the key concern – the principal issue is small firms' ability to compete with larger businesses. In fact, some of the most striking macroeconomic implications of our analysis stem from the disparity between funding costs for small and large businesses. Smaller firms are considered the key driver of job creation, particularly when assessed by the number of local employees per dollar of revenue, given that they are typically more labor-intensive than large firms. Exhibit 8 illustrates the fact that small firms have lagged large firms in job creation since the start of the post-crisis economic recovery, which is a break from the historical norm and may reflect the competitive funding dynamics.

[7] Relying on Census Bureau data, we look at the median characteristics of a US household of three people. This household has annual income of $50,000 and debt outstanding of $130,500. We use the median levels of household debt outstanding, specifically home debt of $117,000, credit card debt of $3,500 and an auto loan of $10,000). We apply the relevant increase in spreads (mortgage +14bp, credit card +199bp, and auto loan -17bp) to each category to identify the increased interest expenses.

[8] The US has a total of 28 million small businesses, of which roughly 23 million are owner/operator businesses; the remaining 5 million have at least one employee in addition to the owner/operator (termed 'employer firms'). According to the US Census Bureau, the overwhelming majority (99.7%) of employer firms in the US have fewer than 500 employees. These 5 million 'small' businesses collectively employ approximately 55 million people and have an annual payroll of $2.2 trillion.

Exhibit 8: Job creation for small firms is lagging in this recovery, in a break from the historical pattern
year-on-year net change in employment



Source: Goldman Sachs Global Investment Research, Bureau of Labor Statistics.

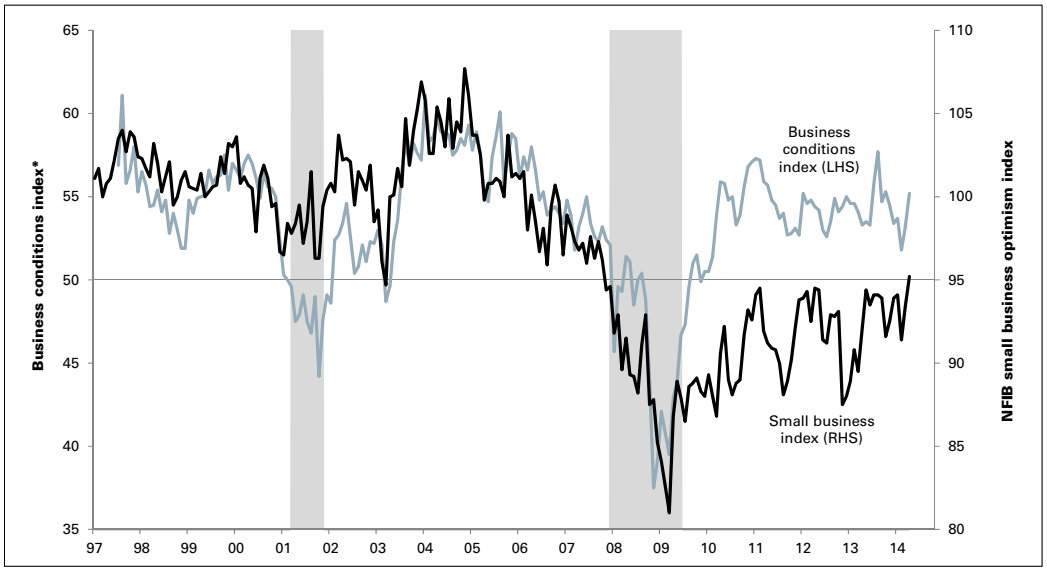
These competitive dynamics are even more apparent in the divergence between the Institute for Supply Management's (ISM) purchasing managers' index, which measures the overall health of large firms based on five indicators,[9] and the small-firm equivalent from the National Federation of Independent Businesses (NFIB).[10] Before the crisis, these two indices tracked quite closely, but since then the large-firm ISM has indicated strong growth and a fairly normal cyclical recovery, while the small-firm index indicates that smaller firms have remained in recession. See Exhibit 9.

A similar demonstration of the way in which large firms have fared better than their smaller counterparts during an economic recovery that has significantly lagged historic norms is the performance of revenues for S&P 500 non-financial firms. These have actually been at the top end of the historical range for a cyclical recovery, suggesting that large firms have taken significant market share from small and mid-sized firms. See Exhibit 10.

[9] The ISM's monthly composite index is based on five indicators: new orders, production, employment, supplier deliveries and inventories.

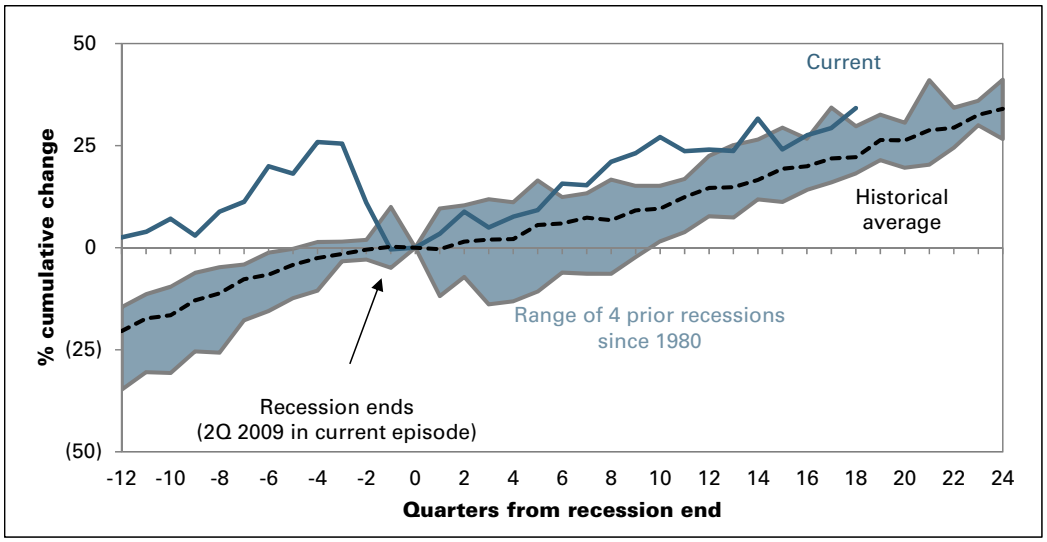
[10] Indicators underlying the NFIB survey are plans to increase employment, capital outlays and inventories; expectations for the economic outlook, sales, credit conditions and expansion; and current inventory, job openings and earnings trends.

Exhibit 9: Optimism is rising among large firms, but still lagging among small firms
shaded areas indicate recessionary periods



Source: Goldman Sachs Global Investment Research, Institute for Supply Management, National Federation of Independent Business, NBER. (*) Weighted average of manufacturing and nonmanufacturing indices.

Exhibit 10: S&P 500 non-financials' sales are at the top end of the historical range
cumulative % change in sales from end of recession



Source: Goldman Sachs Global Investment Research.

Banks and their shareholders pay too

As with any form of tax, the cost is ultimately borne by the targeted firms as well as by their customers. So although our analysis has focused on the overall economic impact, it is important to note that banks themselves have also paid the cost of increased regulation. There are direct costs, including compliance and back-office operations that have expanded significantly to address new rules, including the Volcker Rule and derivatives clearing. Ex-post scrutiny into pre-crisis mortgage practices, among other issues, has led five of the six largest US banks to provision nearly $80bn in aggregate legal reserves since 2010, according to company filings.

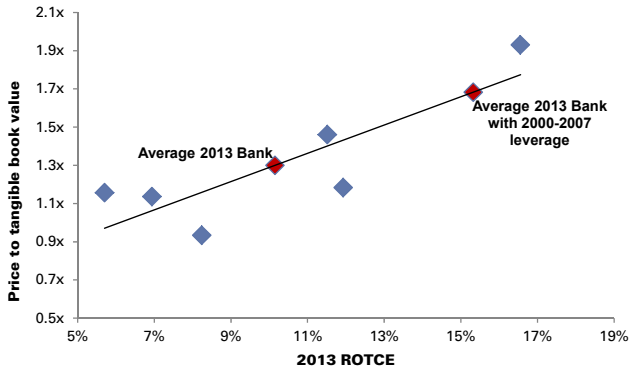
While not the focus of our study, we note that bank shareholders have also paid a price for increased regulation. Between late 2008 and the end of 2009, the six largest US banks raised nearly $170bn in fresh equity, diluting existing shareholders by at least 5% and as much as 82% in the most extreme case (see Exhibit 11). The additional capital has contributed to a sharp fall in those banks' return on tangible equity (RoE), which is now 10% on average, against an average of 31% for the 2000-2007 period. Lower RoEs have in turn reduced bank equity valuations and thus the value of bank shares. We estimate that the observed decline in the six largest US banks' ROE over this period has reduced the value of their shares by more than 20%. See Exhibit 12.

Exhibit 11: Shareholders of the six largest US banks have been significantly diluted
common equity raised by six largest US banks 2008-2009

Bank	TARP funds received ($bn)	Common equity raised ($bn)	Common equity raised as % of TARP funds	Common share count dilution
Bank of America	45	48	106%	37%
Citigroup	45	83	184%	82%
Goldman Sachs	10	6	58%	9%
JP Morgan	25	6	23%	5%
Morgan Stanley	10	5	46%	20%
Wells Fargo	25	21	83%	18%
Total	160	167	104%	29%

Source: Goldman Sachs Global Investment Research, SNL Financial, company presentations. Common shareholder dilution is calculated as the change in common equity shares from the time of the initial TARP receipt until the final TARP repayment. Bank of America figures include funds it received after its acquisition of Merrill Lynch.

Exhibit 12: The average price-to-tangible book multiple for the six largest US banks has contracted by more than 20% vs. pre-crisis levels



Source: Goldman Sachs Global Investment Research, FactSet.

V. Conclusion

It is important to note that we do not attempt to analyze whether the new lending rates are better or worse characterizations of risk than the pre-crisis rates. Our calculations simply show the degree to which new rules and regulations have affected lending and where those effects have been most acute within the economy. The normative conclusion that can be drawn from the role of market substitutability is that markets and regulators differ meaningfully in their assessment of risk. For example, the relative normalcy of auto lending, which is one of the bright points in the current economic cycle, suggests that the regulatory burden of new bank regulation bears much of the responsibility for changes in pricing across the rest of the consumer lending categories we assess. Increased bank regulation has had real economic impacts and may be a significant contributing factor to the ongoing sluggishness of consumer spending. A similar story can be told in the commercial lending markets, where the economic recovery for the large firms that now enjoy a substantial funding advantage has been rapid and generally in line with previous economic cycles, while the small and mid-sized businesses that are more dependent on banks have lagged substantially.

Appendix A: Select rules and regulations applicable to US banks enacted since 2008

Capital requirements and planning; liquidity restrictions; enhanced prudential standards

- Basel III risk-based capital requirements and revisions to risk-weightings
- G-SIB capital surcharges and US-based SIFI capital surcharges
- Leverage ratio
- Comprehensive Capital Analysis and Review (CCAR): capital plans, risk-based capital requirements, leverage constraints, annual stress tests (among other components)
- Net Stable Funding Ratio (NSFR)
- Liquidity Coverage Ratio (LCR)
- Resolution planning ('living wills')
- Supervisory guidance on leveraged lending activities
- Single-counterparty credit limits

Consumer protection

- Credit CARD Act
- Durbin Amendment (interchange rule)
- Qualified Mortgage/Ability to Repay rule

Securitization

- Credit risk retention requirements
- Due diligence analysis and disclosure requirements for asset-backed securities

Structure and activity restrictions

- Volcker Rule restricting proprietary trading

Regulation of over-the-counter (OTC) derivatives activities, including (but not limited to):

- Mandatory central clearing
- Trade execution (regulated platforms)
- Trade reporting to data repositories
- Margin requirements for uncleared derivatives
- Business conduct standards
- Registration of securities-based swap dealers and swap dealers
- Treatment of cross-border transactions

Appendix B: Benchmark maturities and proxies used in our analysis

Exhibit 13: Summary of proxy used for each lending market and the relevant risk-free benchmark

Key lending markets		
Loan/borrower type	**Proxy used**	**Risk-free benchmark**
Credit card		
Higher FICO	Gold/platinum card APR offerings	1-Year Treasury
Lower FICO	Standard card APR offering	1-Year Treasury
Residential mortgage		
Conforming	Average GSE-eligible mortgage rate	10-year Treasury
FHA/VA	Average FHA-eligible mortgage rate	10-year Treasury
Sub-prime	Subprime private-label MBS	10-year Treasury
Jumbo	Bankrate - 30 year loans	10-year Treasury
Auto	Commercial bank - new car loan	5-year Treasury
Home equity	Mid-price HELOC via bankrate.com	10-year Treasury
Commercial real estate (CRE)		
Class A (higher-credit)	Life insurance com. mortgages	10-year Treasury
Class B (mid-credit)	CMBS conduit com. mortgages	10-year Treasury
Smaller CRE	Domestic bank CRE loans	10-year Treasury
Commercial & industrial		
Large investment grade corporate	iBoxx IG corporate bonds	Applicable Treasury (1)
Large high yield corporate	BAML/Barclays high-yield indices	Applicable Treasury (1)
Medium unrated corporate	S&P leveraged loan index	3-month Treasury
Small unrated corporate	Domestic bank C&I loans	3-month Treasury

Source: Goldman Sachs Global Investment Research, Inside Mortgage Finance, Bankrate, Federal Reserve, Mortgage Bankers Association, Standard & Poor's, iBoxx, Bloomberg. (1) Each bond in the IG index is measured against the appropriate benchmark Treasury, determined by the bond's maturity date. The spread in the HY index represents the option-adjusted spread (OAS).

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