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The impact of Deregulation, Recession & Dodd-Frank Act on US Banking Profitability (1970-2019)

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I hereby declare that the work submitted is mine and that where I have made use of another's work, I have attributed the source(s) according to the Regulations set in the Student's Handbook.

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Preface

“There can be few fields of human endeavor in which history counts for so little as in the world of finance. Past experience, to the extent that it is part of memory at all, is dismissed as the primitive refuge of those who do not have the insight to appreciate the incredible wonders of the present.’’ (John Kenneth Galbraith, A Short History of Financial Euphoria, 1990).

Abstract

This dissertation was written as part of the MSc in Management at the International Hellenic University.

The dissertation attempts to analyze the transformation of the US banking industry during the period 1970-2018. Initially, a comprehensive literature review focuses on the impact of events that acted as catalysts for the transformation of the US Banking industry, namely Deregulation, Recession, and Dodd-Frank Act. Furthermore, the Determinants of US banking profitability are investigated across the period of 1999-2018. The sample is comprised of 118 US Listed Bank Holding Companies with more than 10 billion in Assets. The study is conducted through panel data regression using a fixed-effects model with entity and time effects. The model incorporates Bank-specific, Industry-specific, and Macroeconomic variables. The main results suggest that the profitability of large US banks is influenced by Capital Strength, Credit Risk, Diversification, and Productivity.

Keywords: USA, Deregulation, Recession, Banks, Profitability

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1. INTRODUCTION

1.1. Background

During the last 50 years, the US Banking system has undergone significant transformation as a result of major political, social, and technological circumstances. After 1980, the credit system experienced structural transformation due to changes in regulation, demand, and technology (Rajan, 2006). As a consequence, the competition in the conventional lending ecosystem intensified, and the role of intermediation weakened. The new status quo urged banks to develop new ways of efficiently diversifying and boosting their profits. Equilibrium and deregulation affected the income statement of banks. Banks transitioned from interest-income to non-interest income. (Albertazzi and Gambacorta,2006)

The overdependence on interest margins forced banks to alter their conventional practices and pursue more aggressive tactics of generating profits such as trading, underwriting of securities, and securitization. These strategies of non-interest income took off as they coincided with the increased desire of retail and corporate customers to access and invest in financial markets (Albertazzi and Gambacorta,2006).

However, increased interconnectedness in financial markets and the high degree of globalization intensified competition and reduced margins. In particular, financial innovation and regulation constitute the most critical aspects that contributed to transmogrifying the banking industry.

In regards to regulation, as the US Federal government provided a “carte blanche” to banks to diversify their activities in tandem, the industry was directed towards significant consolidation. Ideologies such as “government is the problem,” “financial modernization” and “Efficient Market Hypothesis” drove financial regulation (Crotty, 2009). Those ideologies established a new consensus in which the inevitability of financial innovation, the self-correcting nature of markets, and the pursuit of best interest were perceived as beneficial for the overall economy. However, as time progressed, this consensus was rebutted, and the core underlying problems were exposed.

The US Recession of 2008 that constitutes perhaps one of the most important events of the 21st century, uncovered those problems. The Recession kicked off in December 2007 and finished in June 2009. It is considered as the most severe economic and financial meltdown since the Great Depression of 1929. The root causes of the US recession pertain to lax credit conditions, weak and fraudulent underwriting practices extensive deregulation (Stiglitz, 2010), financial innovation and complexity (Crotty 2009,) incorrect pricing of risk, (Stiglitz, 2010) overleveraging (Cabral,2010) and commodities boom. All these aspects essentially paved the way for the reinforcement of the Shadow Banking system and the growth of the Housing Bubble. In turn, subprime and predatory lending practices were allowed to become the norm leading inevitably to a systemic crisis (Palley, 2010).

Despite the structural problems of technical nature, the root causes of the Recession were also found to be associated with behavioral elements. Specifically, deregulation, unsupervised financial innovation, and a protracted period of loose expansionary monetary and fiscal policy (Verick and Islam,2010) cultivated a dangerous culture in the financial industry (Rajan, 2006). This culture was characterized by perverse risk-taking incentives (Rajan, 2006) with the aim of generating exorbitant profits. However, both the banking industry and the government were victims of multiple behavioral biases such as: “moral hazard” (Stiglitz, 2010) “herding,” “wishful thinking,” “groupthink,” “representativeness heuristic,” “anchoring,” “informational cascade” and “time is different.”

The outbreak of the crisis resulted in significant widespread political, economic, and social implications whose effects are still echoing today. The Recession of 2008 led to massive losses, failures of prominent financial institutions, and broad destabilization of the global economy. The severity of the impact forced many states across the world to initiate responsive procedures to prevent the global financial system from collapsing. Unprecedented fiscal and monetary measures were employed to refuel the financial system through various stimuli and to restart growth. In order to countervail the impact of the crisis and avoid systemic collapse, the governments employed several measures.

The regulatory bodies subsidized troubled institutions with massive capital injections, introduced sharp drops in interest rates, and provided fiscal stimulus packages. In the aftermath of the Recession, international trade, stock and commodity markets experienced significant drops combined with rising unemployment. Furthermore, the consequences of the Recession led to business retrenchments, decline of consumption, and long-term growth. Consequently, the crisis spread across the world through a contagion effect that led to the European sovereign debt crisis and affected the economy of Asia significantly. The Recession of 2008 was unanticipated worldwide by policymakers, agencies, academics, and investors. It proved that the degree of diversification, interconnectedness, and innovation present in financial markets rendered the process of regulation extremely cumbersome.

Primarily, the scale of diversified activities, the depth and the complexity of innovation in financial markets and institutions created great regulatory confusion and inefficiency. Subsequently, governing bodies focused on the imposition of stringent regulatory frameworks in the financial sector to prevent the recurrence of similar phenomena in the future. In this context, the task of regulatory oversight had been arduous due to the overlap of jurisdictions between multilateral involved agencies.

The new regulatory framework materialized with the Dodd-Frank Act of 2010 that focused on thorough oversight, reinforced capital adequacy, frequent stress testing, and macro-prudential regulation. The persistence of stagnating growth, along with the limitations and gaps of the current regulation, have led numerous experts worldwide to doubt the impact and efficiency of the Dodd-Frank Act. The widespread disbelief towards the ability of the system to reduce global systemic risk along with many of the incentives and complexities that contributed to the devastating Recession of 2008 are still evident.

1.2. Motivation

The aftermath of the global crisis established a new ethos regarding the operation of financial markets and the management of economies. The severity of the crisis set in motion a fundamental shift in the banks' culture coupled with widespread de-risking and deleveraging. Although significant progress has been made on developing effective processes that deal with bank failures, especially when they are large, the market structure that emerged from the financial crisis involves significantly larger institutions, particularly U.S.-based ones. The large got massive, and the small banks got more complicated.

Moreover, compared to 10 years ago, the policy flexibility and the tools that governments and institutions can use to confront a new financial crisis are greatly diminished. Interest rates are being at much lower levels than in 2009, the U.S., central banks' balance sheets are already large, and debt levels are significantly fickle and higher than before the global financial crisis. Deterioration in long-run growth potential and depressed productivity growth are still evident. Additionally, the global political polarization and the shift of economic power from the West to the East were direct results of the crisis. All these aspects compose a dangerous and ominous blend of dynamics that maximize the possibility of a reemerging financial crisis.

1.3. Aim and Objectives

Taking into account the context above, this dissertation aims to investigate the transformation of the US Banking industry in the period under consideration (1970-2019). This dissertation focuses geographically on the US Banking sector due to its importance for the global economy. The motivation and rationale for this choice stem from the USA's leading role in the global economy. The US economy is considered the largest in the world; The US dollar is the primary international trade and reserve currency and drives "dollarization." Most importantly, the country is at the forefront of technological development and is especially dominant in service-industries, such as financial services, information technology, healthcare, and retail. In particular, the USA is considered the financial center of the world due to the size and interconnectedness of its financial markets.

Thus, considering the dependence of the global economy on the USA, it can be constructive to examine the development and status quo of its financial sector holistically.

The period under consideration (1970-2019) has been chosen to explore the impact of catalyst events and changes that USA experienced after 1970. Three critical and distinct phases have reshaped the world of finance and in sequence, the global economy. Namely, “Deregulation, Recession of 2008 and Dodd-Frank Wall Street Reform and Consumer Protection Act” constitute those three phases. Provided that these 3 phases consist of events that are complex and multifactorial, the literature is quite extensive and relatively ambiguous as there are no ultimately definitive conclusions that cast light on the causality and impact of these events. Furthermore, these events have profound implications of political, social, and economic nature. Despite the paramount importance of these events for the global economy, professionals are divided and express conflicting views for the effects of those catalysts until today.

Retrospectively, in order to achieve the aims mentioned above, the following objectives have been set. First, a collection of the extant literature has been carried out. An effort has been made to synthesize the majority of relevant material in a comprehensive and coherent narrative. This narrative focuses on the assessment of the changes that Deregulation, Recession, and Dodd-Frank Act brought upon the US Banking industry. The lens of the literature review combines historical and economic perspectives. Second, multiple graphs have been developed and examined that shed light on the evolution of key US economic and banking metrics across the period under consideration. Third, an econometric model based on the extant literature is applied to the major US banking institutions that emerged from the crisis in an attempt to investigate the current Determinants of Banking profitability. The originality of each part will be analyzed briefly in the respective sections.

1.4. Research questions

Ultimately, this dissertation attempts to provide answers to the following research questions: First, how the period of Deregulation during 1970-1999 led to a large scale transformation of the US Banking industry? Second, which were the root causes of the Recession of 2008, and how these affected the US banking sector and the economy and resulted in regulatory changes? Third, was the major financial overhaul of banking regulation through the enactment of the Dodd-Frank Act effective in addressing problems in the banking industry and future Recession concerns? Finally, in the aftermath of the Recession and the Dodd-Frank Act, which are the current determinants of profitability for large US banks?

1.5. Structure of the Dissertation

The Dissertation is organized as follows. Section 2 reviews the relevant literature on Deregulation, Recession, and Dodd-Frank Act. Section 3 refers to the data methodology describing sampling, econometric model, variables, and limitations. Section 4 reports the empirical results along with Descriptive statistics, Correlation Matrix, and Robustness tests. Finally, Section 5 summarizes conclusions.

2. LITERATURE REVIEW

2.1. Structure and Approach

The approach of this literature to presenting the foundation of prior knowledge for these topics is twofold. This approach incorporates in tandem standpoints of view from political economy and economics.

The first part examines the onset and the effects of US financial deregulation from 1970 to 1999. More specifically, the historical context, the transformation of the US banking industry, and the effects of deregulation on risk-taking, compensation, and growth will be analyzed briefly. The second part explores the root causes and ramifications of the recession of 2008. The third part investigates the effectiveness of the Dodd-Frank Act as a regulatory response to the financial crisis of 2008.

2.2. Deregulation of the US Banking industry (1970-1999)

Zhang (2017) initially describes the historical origins of Deregulation in the US banking industry. He reports that at first, the United States government regulated banks to avail itself of tax revenue for public finance. Consequently, states were aiming to reduce competition to gain tax monopoly funds leading to the creation of the so-called ‘’Unit banking states”. During the start of the 20th century, regulation of the banking sector evolved into a conflict of political ideology between small community banks of rural areas and large banks of urban cities. The rural banks had entrenched their positions in the local markets and were preponderant institutions with substantial monopoly rights. The lobbying influence of these rural banks attenuated the expansionary activities of large banks through the enactment of the McFadden act of 1927 that effectively prohibited interstate branching and restricted intrastate branching.

Large urban banks tried to exploit a loophole of the Act by creating Bank Holding Companies to bypass restrictions and propagate into other states via acquisitions. Eventually, Congress enacted the Douglas Amendment to the Bank Holding Company Act of 1956. The Act provided the option to every state to confine Bank Holding Companies from buying or acquiring banks in other states. All states exercised the option, thus forestalling Bank Holding Companie’s ability to perform Interstate acquisitions without consent of the target firm and both states involved in the transaction. A part of The Saint Germain Act in 1982 amended the Bank Holding Company act of 1956 and allowed any Bank Holding Companies to acquire failed banks and thrifts without taking into consideration state laws.

The beginning of widespread deregulation can be traced to 1978 when the state of Maine revoked restrictions on interstate branching followed by Alaska and New York in 1982, which in turn created a domino effect. In 1994 the enactment of the Riegle-Neal Interstate Banking and Branching Efficiency Act repealed the Douglas Amendment and gave carte blanche in Bank Holding Companies’ to engage in interstate acquisitions and subsidiary mergers.

Zhang (2017) states that the wave of interstate and intrastate branching that followed deregulation was mainly executed via mergers and acquisitions and not via de novo branching. He bases the explanation for this choice on the rationale that creating a new branch involves incurring fixed costs to capture a reduced market share, whereas an acquisition is easier and gives banks access to a bigger market share. Moreover, Zhang (2017) attempts to explore the reasons that instigated this wave of deregulation.

First, he states that technological developments altered how banks engaged customers and conducted business. He refers to ATM technology that closed the distance gap and rendered branches somewhat redundant. The author expands this argument by highlighting that the "personal" element of relationships between banks and customers relatively dissipated. Banks started engaging in investment banking activities such as stocks, bonds, derivatives, and advisory services that did not require that close relationship. Second, Zhang (2017) points out that demographics in terms of the urbanization of American society wound down the lobbying force and primacy of once well-established community banks.

Another reason was associated with the global position of US banks. Because of the geographic restrictions, US Banks were smaller compared to foreign competitors, and as the latter initiated large-scale expansionary activities in the US, the issue came into the political spotlight, stressing the need to render US Banks more competitive. Finally, Zhang brings up the fact that the worrisome number of failures across undiversified small banks exacerbated the systemic threat to the US economy, thus precipitating the need for deregulation to amplify the strength of the Banking system.

Moving into the practical part of this paper, the author finds that Deregulation, on the one hand, brought about an increase in economic growth at the state level. As credit supply sources became more diverse and banking markets more integrated, these changes facilitated the access of smaller firms to funds, as a result, loans and investments rose to engender higher growth. Zhang (2017) argues that as the interconnectedness of markets heightened, a tradeoff was created between regional growth and systemic risk depending on shocks being "idiosyncratic, state-specific or widespread systemic."

Saunders, Strock, and Travlos (1990) examine the relationship between bank ownership structure and risk-taking. They argue that stockholder controlled banks provide stock option compensation to executives to induce higher risk-taking than risk-averse managerially controlled banks. Furthermore, in periods of deregulation, this difference in risk-taking levels is becoming more acute, effectuating the need for supervision.

Hubbard and Palia (1995) examine the effect of interstate banking deregulation on executive pay structure through the lens of the Managerial Talent Hypothesis. The Managerial Talent Hypothesis states that highly competitive markets require highly skilled and talented Executives; therefore, a high level of compensation is required to attract these executives. Consequently, the pressure to perform is conducive to higher turnover rates.

In this context, they examine how the levels of different types of CEO compensation, such as bonuses, salary, options, and equity ownership changed after Deregulation. They account for the factor of size to observe whether faster-growing banks attract CEOs with higher levels of compensation. The authors find strong evidence in line with the Managerial Talent Hypothesis showing that higher compensation, performance-based compensation, and executive turnover rates are more evident in deregulatory environments. They also find evidence that the size of banks positively influences the level of compensation.

Bechera, Campbell, and Fryec (2003) state that as a response to deregulation, intensified competition, and opportunity, banks started offering more equity-based compensation that generated better performance and growth without excessive risk. The new deregulatory environment set in motion changes in governance structure and internal monitoring to align management -shareholders' incentives. Chen, Steiner, and Whyte (2006) report that the widespread establishment of stock option-based compensation can raise the risk-taking levels of banks and in reverse risk impacts compensation structure. As a result, the authors underpin that regulatory supervision of the compensation structure is crucial.

Belkhir and Chazi (2010) find that the shareholders of prominent Bank Holding Companies that are active in deregulatory environments offer their CEO stock options sensitive to risk to avoid risk-averse behaviors and proliferate risk-taking incentives. Consequently, the sensitivity of stock options to equity risk influences the CEO's decisions, which, in turn, determines the overall level of bank risk. Berger et al. (1995), analyze the transformation of the US Banking Industry throughout 1979-1994. To begin with, they report that this transformation is evident through many factors such as the reduction of banking organizations; the high level of failures; the development of Off-balance sheet activities; the emergence of foreign lending to US Corporations; the introduction of ATMs; a weakening bargaining power over depositors and the subsequent higher cost of funds; the reinforcement of equity capital; the repeal of interstate restrictions that ratcheted up interstate expansion and the decline of commercial and industrial lending.

The authors attribute these changes firstly to extensive deregulation that urged banks to raise capital and expand and secondly to innovative developments in applied finance and technology such as information processing, telecommunications, securitization, and derivatives. Moreover, the authors highlight that the Banking industry experienced significant growth in size in terms of assets, deposits, and loans, which in turn offset the decline of market share emanating from rising competition.

In combination with the argument as mentioned above, the authors pinpoint that the consolidation of the banking industry affected bank lending significantly redirecting the flow of funds from smaller to larger firms driven by a diseconomy of scales effect.
Wheelock and Wilson (2000) find that less capitalized banks are more likely to be acquired. Also, branching deregulation can reinforce the diversification and resilience of banks to idiosyncratic shocks. Finally, they report that inefficiency causes failures and discourages acquisitions. Jeon and Miller (2001) examine the merger rates of banks after interstate and intrastate deregulation. They suggest that most mergers occur in intrastate as smaller banks attempt to avoid the threat of interstate acquisitions by major banks. Additionally, deregulation creates an uptick in concentration. Finally, they support that deregulation affects the level of entries and exits in the banking sector.

Stiroh and Strahan (2003) argue that Deregulation started from the 1970s with states allowing interstate acquisitions and statewide branching. These changes have resulted in multiple entries of banks in new markets and decreased cost and price of services. Consequently, the factor of competitiveness in the banking market elevated.

However, Stiroh and Strahan state that an adjustment period is required to observe actual changes in the market share landscape. The primary beneficiaries of these changes were the big banks as they experienced an increase of 20% in total assets held, climbing from 50% to 70%. More specifically, Stiroh and Strahan report that deregulation is contributive to substantial merger activity that enables the exit of weaker banks. Additionally, they touch upon the influence of the reallocation of market share in an industry, a factor significant for the structure and success of banking.

They report that the growth of more efficient firms that claim bigger market shares enhances the performance of the industry. The acquisition of weaker firms can boost performance as well through the replacement of incompetent management. Mainly, deregulation paved the way for branching and not de novo banking since the latter requires an extended period to reach efficiency levels. Overall, Deregulation by increasing competition led to a reallocation of assets to more profitable banks, which in turn made the industry more profitable.

Strahan (2003) argues that Branching and Interstate Banking deregulation improved the quality of banking services and lowered their costs. Subsequently, the real economy “Main Street” benefitted as economic growth created by new businesses accompanied deregulation. Tirtiroglu, Daniels, and E. Tirtiroglou (2005) report that regulation negatively affected bank’s productivity, whereas only intrastate deregulation had a positive long-term influence on the bank’s productivity growth.

Cetorelli and Strahan (2006) suggest that competition between banks affects the structure of non-financial sectors significantly as the effect can be double-edged. Potentially, increased competition can improve access to credit for small firms, whereas concentration can limit it. Correa and Suarez (2009) argue that deregulation acted as a stabilizing factor for small firms more dependent on external financing. New interstate bank entries drove extended access to credit by fortifying the firm's resilience to absorbing idiosyncratic shocks. As short-term credit became less procyclical, it lowered the idiosyncratic risk of firms' stocks thus reduced volatility.

Chava et al. (2013) find that Financial deregulation can boost economic growth by empowering the innovation of small firms. However, the nature of deregulation is crucial as they observed contrasting effects on innovation between intrastate and interstate deregulation. Korinek and Kreamer (2013) find that deregulation triggers redistribution effects. On the one hand, deregulation increases risk-taking levels and profits of banks with the possibility of significant losses causing severe credit crunches. In particular, financial innovation, extremely high compensation, concentration, and bailout safety further boost risk-taking. These large excesses directed in the financial sector are in detriment of the overall economy.

On the other hand, regulation diminishes intermediation, and availability of credit, hampering real economic growth potential. Francis, Hasa, and Wang (2014) support the view that increased competition in the banking sector can reduce credit limitations of non-banking firms enabling economic development. Zhao and He (2014) argue that the Gramm–Leach–Bliley Act has increased banks' systemic risk rather than decreasing it. Increased systematic risk creates uncertainty and renders monitoring of Banks cumbersome. Additionally, the authors highlight that the existence of multiple regulatory bodies can cause disclosure discrepancy. In turn, the interaction between multiple institutions can elicit wrong conclusions and obfuscate processes towards mutual solutions. Finally, they stress the importance of data integration and the view that only accounting information is not sufficient to estimate the overall risk. Additional data is needed, such as legal, product and customer datasets.

2.3. US Recession of 2008. Root causes and ramifications

Rajan (2006) claims that the compensation structure of investment managers is based on risk and performance. These two aspects can instigate the pursuit of perverse incentives such as tail risk and herding behavior to generate higher returns and justify underperformance, respectively. Rajan (2006) continues by analyzing the transformation and consolidation of the US banking industry after 1970. The main factors that drove change in the financial industry, according to Rajan (2006), were information, innovation, and deregulation.

Rajan (2006) describes that these parameters decreased monitoring, costs, and distance of lending. As a result, the consolidation of the sector increased access and competition in finance. All these changes augmented overall lending, entrepreneurship, and growth. As banks expanded their customer base and underwent changes in their processes, their role evolved. Rajan analyzes this change by referring to concepts such as "commodification, securitization, specialization, customization, and re-intermediation." Through an extensive analysis of these changes, Rajan (2006) concludes that perverse incentives, the monetary policy of low-interest rates, and deepened integration of financial markets built up the overall level of systemic risk and endangered the global economy.

Acharya and Richardson (2009) attribute Recession of 2008 to banks that reduced their capital adequacy buffers by holding securitized mortgages either Off-balance sheet in entities such as Conduits (SIVs) or on balance sheet by holding AAA-rated tranches. These conditions notably allowed banks to hold less capital and thus increase their leverage. The authors state that credit agencies provided AAA ratings for fee-generating incentives and that Large and Complex Financial Institutions(LCFIs) did not use securitization as an instrument to spread risk but to avoid capital adequacy regulation. The authors also touch on the Asset-Backed Commercial Paper (ABCP) crisis that was precipitated by the use of conduits offering guarantees such as liquidity enhancements and in combination with the AAA ratings, allowed banks to engage in transactions with money market funds effectively engulfing markets with risk.

Finally, the authors suggest that the rationale behind this highly leveraged position on securitized mortgages, pertained to risk-taking incentives of bank's executives, aiming to harness short-term compensation (cash bonuses) and marking to market dynamics.

Crotty (2009) asserts that the root cause of Recession was the so-called "New Financial Architecture" (NFA). The author begins by pointing out that the Efficient Market Hypothesis and Neoliberal Economics replaced the theories of Minsky and Keynes. The new financial system emanated from a combination of rampant deregulation, swift financial innovation, and deep interconnectedness. Specifically, those aspects were guided by trailblazing institutions and practices that designed structured financial products encompassed by "complexity, opaqueness, illiquidity, and leverage." Crotty supports the view that "perverse incentives" evident in financial institutions and rating agencies empowered the pursuit of frivolous high-leverage, high risk, and high return strategies. Crotty elaborates on the safeguarding and further pursuit of these incentives through on balance and off-balance sheet activities that focused on bypassing capital adequacy restrictions to increase profits rather than to distribute the risk as they supposed to.

Furthermore, Crotty suggests that complexity rendered pricing and valuation of structured financial products cumbersome. In combination, this effect was maximized by the complacency and forbearance of regulators that allowed banks to set their risk evaluation and capital requirement strategies by employing flawed tools such as Value at Risk (VAR) models. In addition, the author reports that the excessive use of OTC derivatives and the high interconnectedness in financial markets augmented the contagion effect. The author justifies this opinion by underlining the endogenous nature of systemic risk, the influence of hedging to liquidity, and the further diffusion of risk through advanced derivatives such as CDOs. Lastly, the author stressed out that a significant change in asset prices can severely punish excessive leverage and scarcity of capital setting off a destructive deleveraging process.

Taylor (2009) cites as reasons for the recession of 2008: the relaxed monetary policy of low-interest rates, the preventive focus on liquidity problems rather than counterparty risk, the support of US government on Homeownership programs, the engagement of Fannie Mae and Freddie Mac to the MBS market and the complexity of Mortgage-backed securities (MBS).

Palley (2010) examined the macroeconomic conditions that transmogrified the US growth model and gave impetus to the recession. He introduces the emergence of Neoliberal Economics through the rise in power of political leaders such as Margaret Thatcher (1979) and Ronald Reagan (1980). Palley alludes to the shift from the "commitment to full employment" model based on productivity, growth, and wages to the "asset and debt price inflation model." Full employment was rejected on the grounds of being inflationary and was replaced by the target of controlling inflation. This new model facilitated globalization, enabled the emergence of low-wage foreign competitors, and introduced the strategy of off-shoring and outsourcing employment. Financial boom and low-cost imports partially caused by financial innovation and deregulation, expedited the development of leverage and collateral to reinforce "debt-financed spending." Finally, the author emphasizes that specific characteristics were apparent in all business cycles after the establishment of this new growth model from 1980 and onwards.

He cites explicitly "asset price inflation (equities and housing); widening income inequality; detachment of wages from productivity growth; rising household and corporate debt ratios; rising trade deficits; disinflation or low inflation; and declining manufacturing employment." In particular, he highlights the flawed nature of this model by introducing a "triple hemorrhage," composed of "import spending leak, jobs leak via offshore outsourcing and investment spending leak via off-shoring."
This triple hemorrhage was based on the new international US economic policy on trade deficits, which revolved around the NAFTA agreement of 1994, the dollar policy after 1997, and the PNTR of China after 2000.

Stiglitz (2010) begins by alluding to the importance of regulation, stating that large externalities stemming from one banking institution can create systemic risk. Pricing and asymmetry of information among market participants cannot reflect the actual risk. Moreover, Stiglitz (2010) suggests that the existence of moral hazard based on bailout assurance was conducive to the unfettered risk-taking behavior and opacity of banks. In addition, Stiglitz (2010) suggests that the ostensible distribution of risk through retaining "skin in the game" via off-balance-sheet activities and on balance sheet AAA tranches was convincing as banks were regarded global specialists in risk. Competition, the threat of substitution, and fee incentives compelled the rating agencies to provide the highest ratings to as many banks as possible. As a result, the rating agencies abetted incorrect pricing of risk, complexity, and information asymmetry in favor of short-term profits.

The author suggests that inter alia perverse incentive structures of bank's materialized, through a combination of financial engineering and creative accounting in aspects that were unaddressed by regulation. Finally, the author explains that due to "shortsightedness," the inability to understand risk and lackluster sophistication, investors and other market participants did not pose limitations to banks. Consequently, banks could exploit this situation by pursuing high alpha and beta incentive structures. More importantly, had they not followed the trend of pursuing short-term profits for their investors, then their market perception would be weaker. The burden of maximizing share value induced the CEOs to follow high leverage strategies.

Cornett et al. (2010) report several reasons for the liquidity crunch. First, they cite that banks changed their model of business from "buy to hold" to "originate to distribute." Second, this new model was based on diversified lending through securitization. Third, banks weakened their private information collection mechanisms for local markets. These changes allowed banks to augment their credit offerings excessively.

Moreover, banks shifted from an “on balance sheet asset transformation model” to off-balance sheet activities. In particular, banks engaged in maturity mismatches funding long-term illiquid securitized mortgages with short-term commercial paper. Those loans were moved off-balance sheet into Structured Investment Vehicles (SIVs). As this model was based on constant refinancing with commercial paper, banks had to provide credit enhancements for safety. When refinancing failed, the Asset-Backed Commercial Paper (ABCP) market collapsed, forcing banks to return those assets on their balance sheets. Subsequently, their value declined, and markets started questioning the bank’s solvency. The precarious position of banks resulted in trust issues between banks themselves freezing the interbank market.

Cornett et al. (2010) find that because of those freezes of interbank, Asset-Backed Commercial Paper (ABCP) and Mortgage-Backed Securities (MBS) markets, liquidity evaporated. Banks with exposure on illiquid securitized assets constrained lending, whereas banks with safe forms of financing such as deposits and capital maintained their lending ability. The authors conclude that banks exposed to wholesale debt and demand from borrowers present higher liquidity risk than banks, which are protected by government safety nets in case of depositor outruns.

Cabral (2010) states that “Excessive leverage” and “liquidity risk mismatch between assets and liabilities” constituted root causes for the development of the financial crisis. Cabral (2010) traces the development of these two parameters in deregulation explicitly pointing out to Basel I Capital Accord in 1988 and the reduction of reserve requirements by the US Federal Reserve in 1990. The author explains that the Basel I Accord enabled banks to include in their balance sheet low-risk-weighted assets that required a limited amount of capital to be held.

Consequently, banks could grow their asset base at a more accelerated pace than their capital base. In this context of disproportionate growth, excessive leverage could render the solvency of banks susceptible to only small losses. The reduction of Reserve requirements and the emergence of short-term wholesale funding rendered the liquidity structure of banks vulnerable. Banks inflated their liability side without setting aside a sufficient amount of capital and collateral to address deposit growth and currency outflows. Ivashina and Scharfstein (2010) find that new lending activities across many types of loans declined significantly during the crisis. The authors associate part of this decline to limited expansionary investments by firms. Moreover, the authors highlight a "supply effect" problem. The crisis affected the banking sector disproportionally. Not all banks held sufficient liquidity to provide loans, and in cases of "lenders switching," there were apparent trust issues based on inexistent precedents of service.

Verick and Islam (2010) claim that the root causes of the Recession pertain to extensive deregulation and lax monetary US policy, excessive leverage, and risk-taking incentives boosted by off-balance-sheet activities, negligent assessment of risk by banks and credit agencies, predatory mortgage lending, the complexity of securitization and global exposure to complicated derivative positions. Chor and Manova (2012) suggest that limitations on credit conditions and external financing forced countries to reduce export flows. In turn, this event was conducive to spillover effects of the crisis in international trade.

Rajan (2012) argues that deregulation was a double-edged sword. On the one hand, it boosted "entrepreneurship, innovation, efficiency, and competition by widening access to credit and decreasing the cost of services." Rajan (2012) also pinpoints the connection between innovation, risk, and compensation structure evident in the new business model. On the other hand, it extended income equality as the business model shifted towards knowledge work for which the workforce was inadequately prepared. Rajan (2012) expands this argument by stating that instead of attempting to address the gap between technology and education and upskill lower and middle classes, the US government opted for augmentation of credit to stimulate consumption.

Politicians, bankers, and borrowers exploited the low-interest rates policy and propelled housing and finance forward, fueling unsustainable debt growth.

Hansen (2018) reviews Adam Tooze's book Crashed (2018). Hansen (2018) highlights Tooze's opinion that the Recession of 2008 afflicted international relations, governmental policies, and bred nationalist movements across the world. Hansen (2018) continues by stressing out another main point of Tooze on the crisis becoming global through the high degree of interconnectedness between financial markets. For Tooze, the international range of activities of large banks and their short-term funding model based on repos and commercial paper caused instability and contagion. Tooze, in particular, cites the maturity mismatch of funding long-term illiquid MBSs and CDOs with repos and commercial paper. Moreover, Hansen (2018) underlines Tooze's view that the rationale "Finance for Growth," followed by many US administrations, provided legitimacy for the massive deregulation process of the financial industry.

2.4. The Dodd-Frank Act. An assessment of its effects.

Semaan and Drake (2011) indicate that regulation invokes a concomitant reaction in which firms learn to adjust and compete, and as a consequence, systemic risk decreases, and idiosyncratic risk increases. However, the effect is transient, as in the long-term, both levels of risk decrease. Wilmarth Jr (2011) explores the Dodd-Frank Act's benefits and drawbacks. First, Wilmarth argues that the Financial Stability Oversight Council (FSOC) is effective in demarcating the boundaries of designation and supervision of Systemically Important Financial Institutions (SIFIs). Second, Wilmarth points out that the Federal Reserve Board (FRB) can impose rigorous capital and prudential restrictions on Systemically Important Financial Institutions (SIFIs).

Moreover, Wilmarth emphasizes the creation of the systemic resolution regime known as Orderly Liquidation Authority (OLA) that can effectively recant the recourse of failing Systemically Important Financial Institutions (SIFIs) to the Federal Reserve to invoke bankruptcy reasons. Subsequently, this body can partially stave off bailout assurance and "moral hazard," preserving failing institutions afloat. Finally, the Consumer Financial Protection Bureau (CFPB) can reduce systemic risk by assuaging the exploitation of consumers by financial products.

Regarding the drawbacks, Wilmarth's foremost critic is that the Dodd-Frank Act does not rectify the Too Big to Fail (TBTF) problem. In particular, Wilmarth claims that multiagency oversight and political constraints denigrate the future effectiveness and motivation of the Dodd-Frank Act.

Ludwig (2012) claims that the strengths of the Dodd-Frank Act revolve around the creation of OFR that acts as an outside onlooker that detects systemic events, the establishment of regulations for non-banking institutions and the focus on stress-testing. On the other side, Ludwig (2012) indicate that the weakness of bodies like the Office of Financial Research (OFR) and Financial Stability Oversight Council (FSOC) lie in their inherently political nature and stress-testing is dependent on the proper way of conducting it. Moreover, Ludwig (2012) suggests that further limitations of Dodd-Frank pertain to loopholes that enable regulatory arbitrage, the omission of shadow-banking from regulation, excessive regulation, and diminishment of banks' innovation, competitiveness and market knowledge through the prohibition of proprietary trading activities.

Gao, Liao, and Wang (2013) study how the stock and bond markets perceived the effectiveness of the Dodd-Frank Act on large financial institutions. During the first stage of the passage, they detect that institutions exhibited negative returns in stocks and positive returns in bonds. However, during the final stage of the passage, this situation reversed. Gao, Liao, and Wang (2013) suggest that regarding the effectiveness of the Dodd-Frank Act, markets oscillate between optimism and pessimism. Balasubramnian and Cyree (2014) examine the impact of the Dodd-Frank Act on the market discipline of banks. They find that the Dodd-Frank Act has enhanced market discipline even for large banks. However, the effect of factors such as size and Too Big to Fail (TBTF) status for discounts in yield spreads is still active, indicating room for further future improvements.

Dimitrov, Palia, and Tang (2014) explore the impact of the Dodd-Frank Act on credit ratings. They suggest that the legal and regulatory costs of the Dodd-Frank Act have forced credit rating agencies to showcase conservatism in terms of accuracy and information in their ratings to safeguard their reputation. Akhigbe, Martin, and Whyte (2015) present evidence that Dodd-Frank has effectively decreased the risk-taking behavior of financial institutions and especially of large institutions with strong corporate governance.

Leledakis and Pyrgiotakis (2016) investigate the effect of the Dodd-Frank Act on US bank M&As. Initially, Leledakis and Pyrgiotakis (2016) suggest that increased compliance costs and rigorous capital and prudential requirements potentially constitute factors that lead to further consolidation of the banking sector. Next, the authors observe a growing number of M&As associated with small banks following the enactment of the Dodd-Frank Act. They explain that small banks engage in M&As to juxtapose the benefits of size to offset the pressure exerted by increased compliance costs of the Dodd-Frank Act. More importantly, Leledakis and Pyrgiotakis (2016) demonstrate that small bank M&As develop in hindsight profitability and cost-saving dynamics and, consequently, higher returns.

Hogan and Burns (2019) investigate the effect of the Dodd-Frank Act on bank's non-interest expenses. Hogan and Burns (2019) provide evidence that non-interest expenses in small and large banks have increased following the heightened compliance requirements of the Dodd-Frank Act. Hughen, Malik, and Daniel Shim (2019) examine the impact of the Dodd-Frank Act on executive compensation. They find that total compensation increases by 21% along with long-term compensation by 101%, whereas bonuses decrease by 66%. The results suggest that the increased liability and responsibility of executives towards compliance extend the skills required by managers and thus the incentives towards higher compensation.

3. Data & Methodology

3.1. Determinants of US Banking Profitability

The Determinants of Banking profitability constitute an issue that has frequently been the subject of the study among academics. The literature is quite extensive, and many studies have been conducted to examine the factors that affect banking profitability. So far, the studies have mainly focused on European and Emerging Markets. Generally, literature converges on banking profitability being determined by internal and external determinants. The internal determinants are associated with bank-specific variables id est variables relating to bank activities that are influenced by the bank's executives. In regards to external determinants, those include Industry-specific variables id est variables that are of social, economic, and legal nature and disturb the operation and performance of banks. Lastly, external determinants also consist of macroeconomic variables that are uncontrolled by banks.

In terms of profitability measures, the literature mainly converges on three measures that of ROA, ROE, and Net Interest Margin (NIM). ROA measures the ability of banks to generate profits through their assets whereas ROE measures the return to shareholders and in tandem measures the financial leverage. Usually, banks with lower leverage showcase higher ROA than ROE and since ROE does not take into account the leverage factor that is also subject to regulation, the existing literature considers ROA as the dominant measure of banking profitability. Net Interest Margin is another profitability measure that tracks how successfully a bank is investing and lending compared to the respective expenses. However, this ratio cannot reveal the full picture of a bank's profitability since it excludes non-interest activities. Nonetheless, this dissertation will examine all those measures to uncover potential differences.

The purpose of this dissertation is to focus on the US Banking industry as it constitutes one case that has not been excessively analyzed despite its global financial influence and the severity of events that unfolded, such as the Deregulation and the Recession. In particular, the determinants of banking profitability have been comprehensively examined in the past. However, the impact of Deregulation and Recession of 2008 has not been extensively investigated.

Thus, the contribution and originality of this dissertation revolve around two factors. First, this study examines the US Banking profitability in a particularly long period of 20 years (1999-2019). The model utilizes more than 30 variables and 68.000 observations to account for as many factors as possible, building on and expanding the work of selected papers. At the same time, it investigates profitability during, before, and after the crisis accounting for the effects of Deregulation, Recession, and Dodd-Frank Act.

Second, the sample used is exclusively comprised of larger banks to examine institutions that hold significant amounts of systemic risk and ergo are of greater concern given the structural changes that were introduced in the aftermath of the Recession and the enactment of Dodd-Frank Act. Lastly, given that there are studies that have analyzed the performance of smaller US Banks after the Dodd-Frank Act, this study enables cross-comparisons between banking groups in order to provide a complete view of the US Banking sector. To the best of my knowledge, a similar study has not been conducted.

This study draws inspiration from and is primarily based on the work of:
Demirguc-Kunt and Huizinga 1999; Staikouras and Wood, 2004; Pasiouras and Kosmidou 2006; Kosmidou, Tanna and Pasiouras, 2008; Tregenna 2009; Dietrich and Wanzenried 2011; PS Hoffmann 2011; Zhang and Dong 2011; Owoputi, Kayode and Adeyefa 2014; Adelopo, Lloydking, and Tauringana 2017.

The papers mentioned above provide a thorough and detailed description of many topics addressed in this study and can be referred to for additional explanations.

3.2. Structure of US Banks. Relevant graphs

This section will be composed of graphs that showcase the structure evolution of the US Banking sector during 1970-2018. Additional detailed graphs for the Structure of the US Banks can be found in the Appendix. In order to examine the structure of US Banks, it would be constructive to also examine the status quo of the overall US Economy during the period of our study (1970-2019). Thus, a section that contains graphs that depict critical economic indicators of the US economy is included in the appendix due to its length and to the focus of this section in banks.

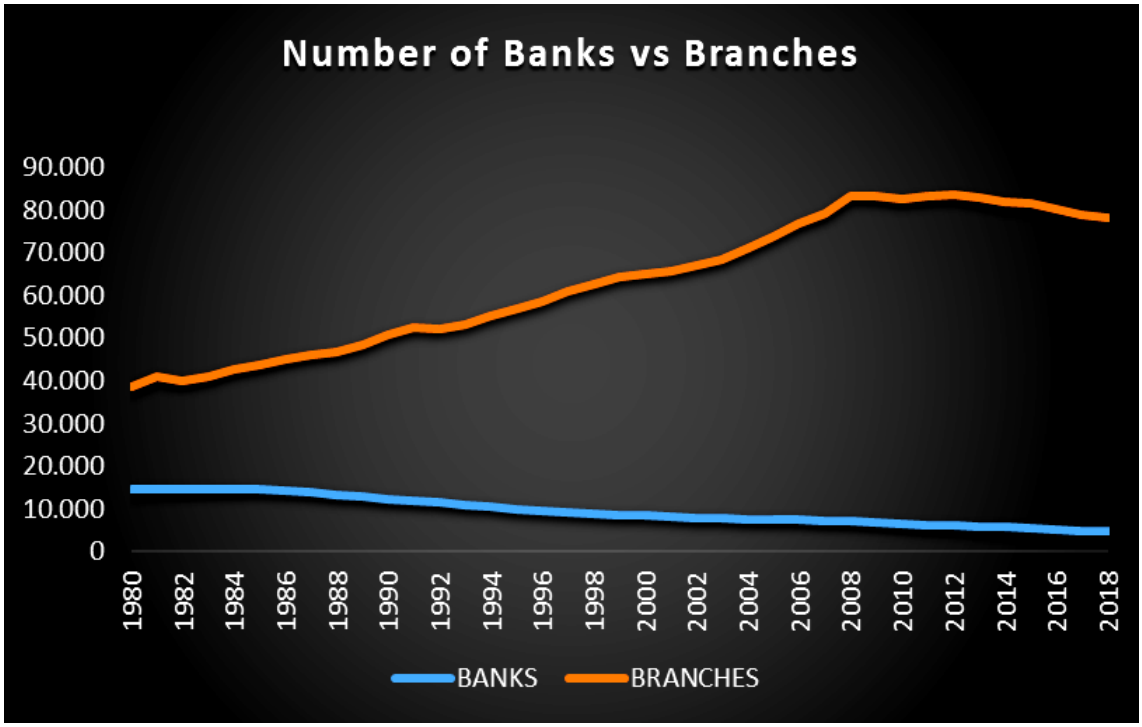

Figure 1: Number of Banks vs Branches (Source: FDIC)

Figure 1 shows the effect of Deregulation on the number of banks. First, we can observe that in the period under consideration (1980-2019), the total number of banking institutions is gradually decreasing, but at the same time, the overall number of branches increases. In particular, Deregulation allowed banks to proceed to interstate expansion through extensive branching and thus reduced the gap between distance and lending. Subsequently, deregulation intensified interbank competition and resulted in further consolidation of the sector that created barriers to new entries.

As a result, the number of banking institutions started to decline over the years steadily.

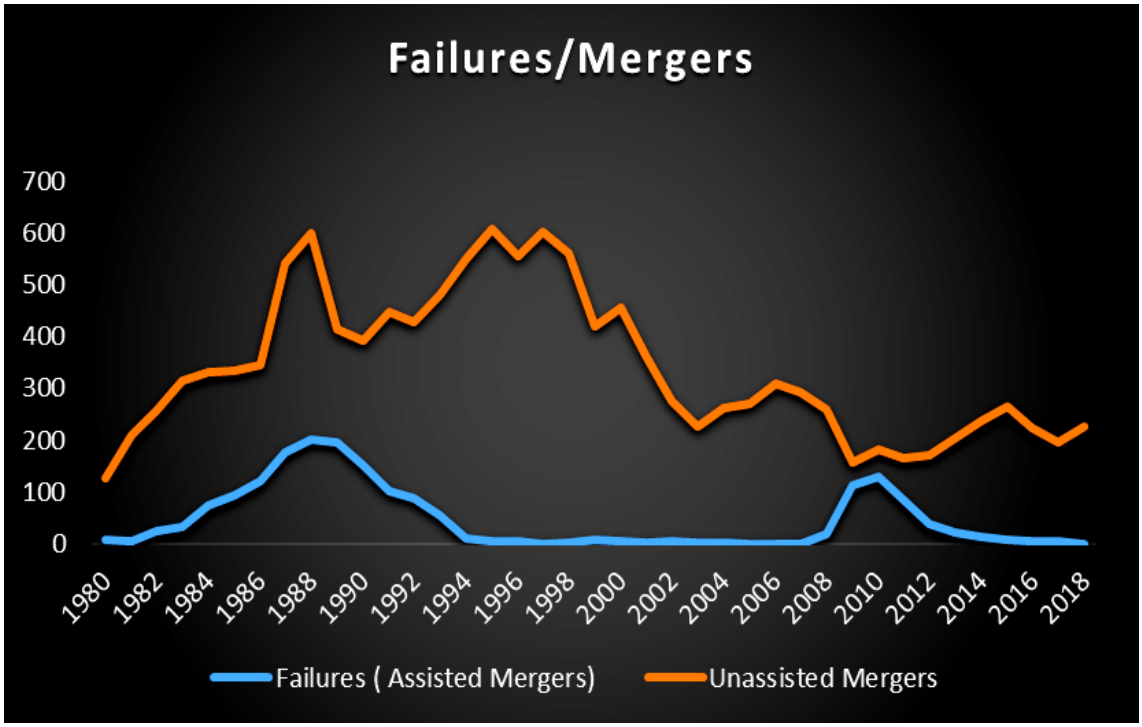

Figure 2: USA, Bank Failures Vs Mergers (1980-2019) (Source:FDIC)

Figure 2 depicts how Mergers between US Banks evolved during 1980-2019.

We can observe that failures increase during the S&L crisis and the Recession of 2008. Mergers substantially increase from 1980 to 1998 and shortly again after 2009. These trends indicate that the two crises forced banks to merge to avoid failures during the S&L crisis and to avoid compliance costs after the Dodd-Frank Act of 2010. The period of low merger activity during the mid-1990s points out to a consolidated banking industry that does not present many opportunities for mergers. This period indicates that the process of deregulation that started after 1980 led to a substantial consolidation and competition of the sector, rendering difficult the entries of new banks into the sector.

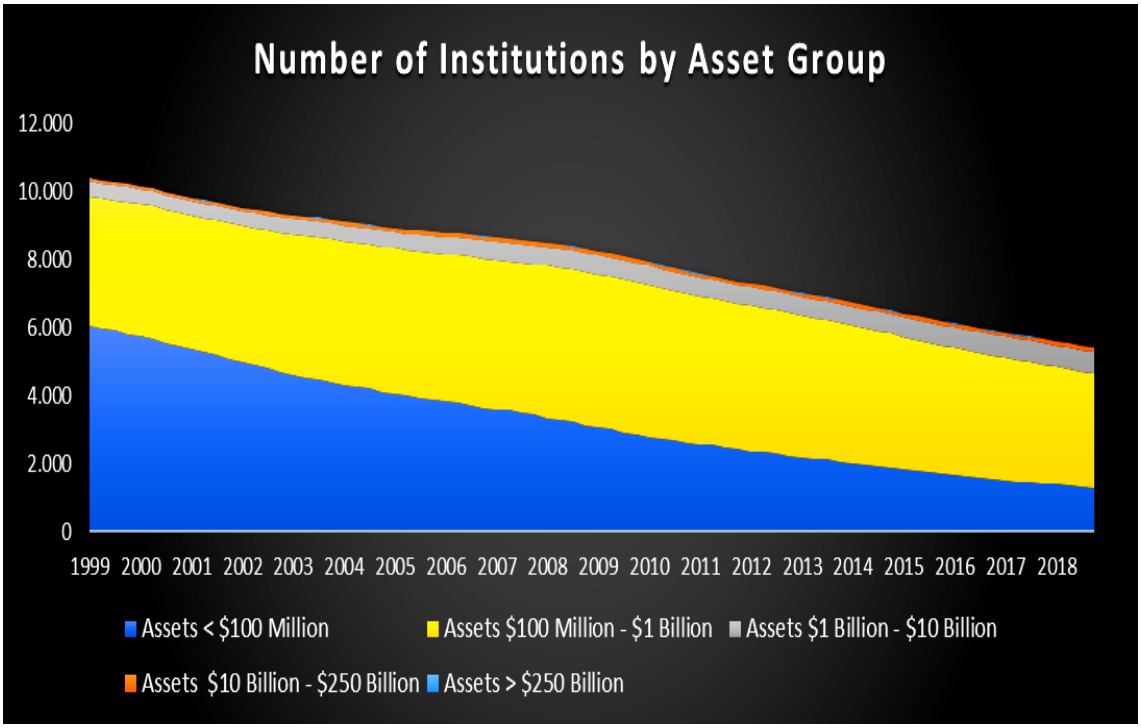

Figure 3: Number of US Banking Institutions by Asset Group (1999-2019) (Source:FDIC)

Figure 3 analyzes the decline of the number of banks in terms of Asset groups.

The sector during this period has consolidated around a few major players. This situation is distinct in figure 3 and Figure 4. We can observe that after 1999 the number of small-medium banks is decreasing.

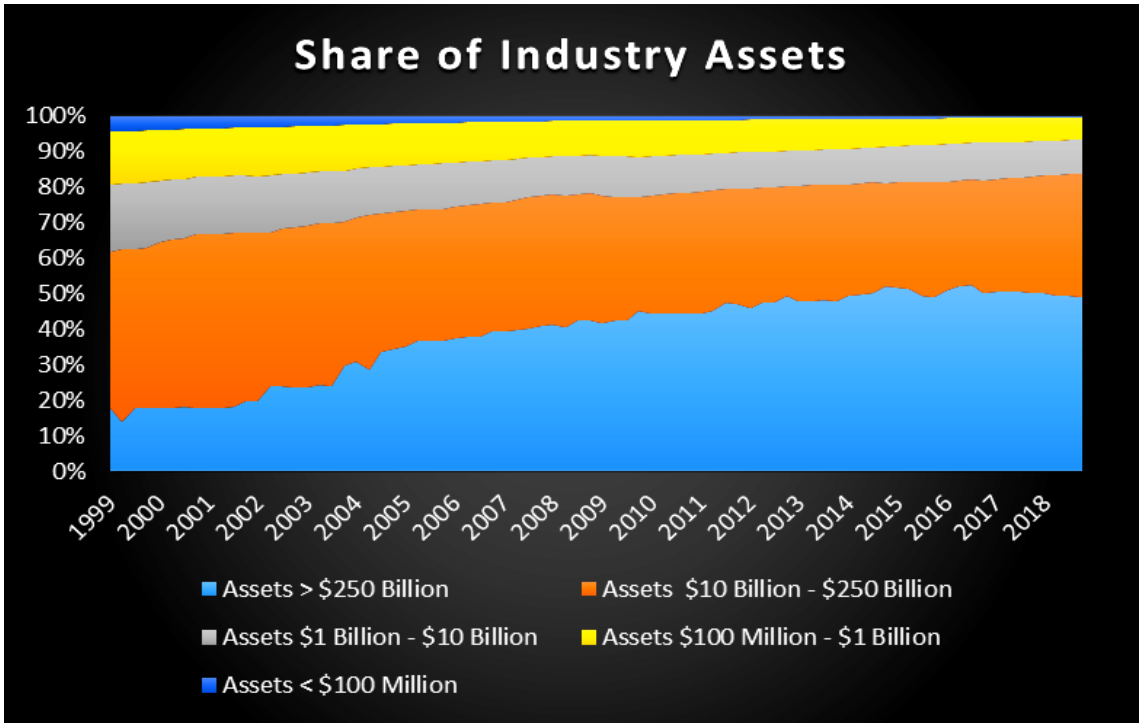

Figure 4: Asset Share of US Banking Industry (1999-2019) (Source:FDIC)

Figure 4 breaks down the allocation of market share between different Bank groups. In parallel, with the decline of small-medium banks evident in Figure 3, we observe that the majority of the market share in assets accumulated in bigger banks. The tendencies in Figures 1, 2, 3, and 4 collectively suggest that from 1970 to 2018, the banking industry experienced consolidation of the industry around a few major players.

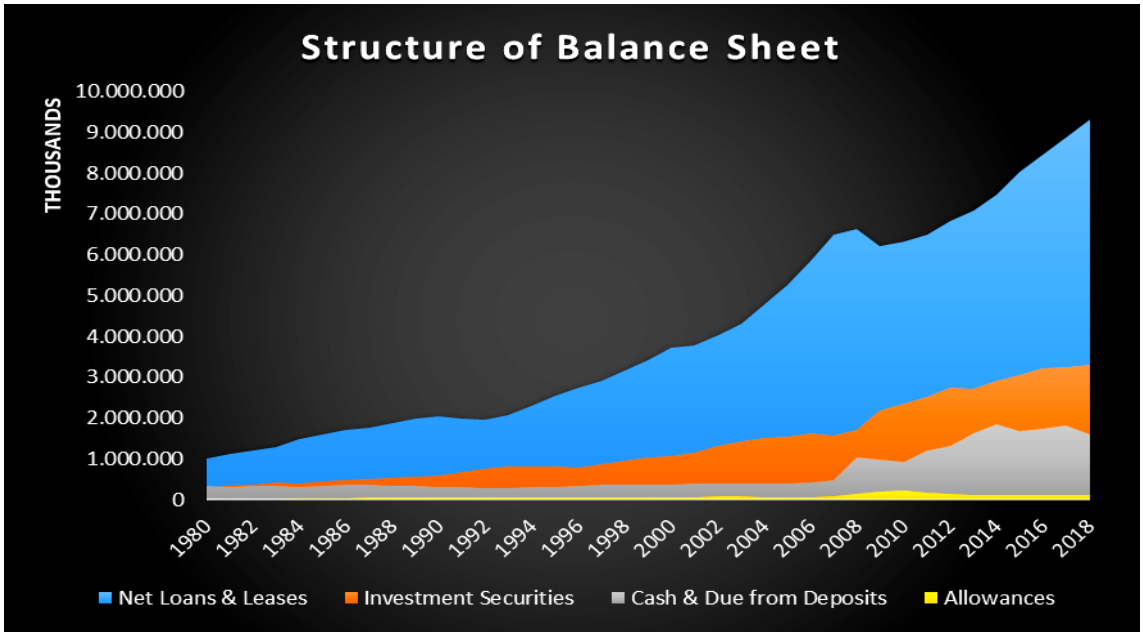

Figure 5: US Banks, Structure of Assets (1980-2019) (Source: FDIC)

Figure 5 depicts the Structure of the Asset side of the Balance Sheet of US Large banks. We can observe that it is mostly composed of loans and investment securities. After 2008, we can notice that cash and due from deposits substantially increase. This fact can be attributed to the capital requirements imposed by the Dodd-Frank Act.

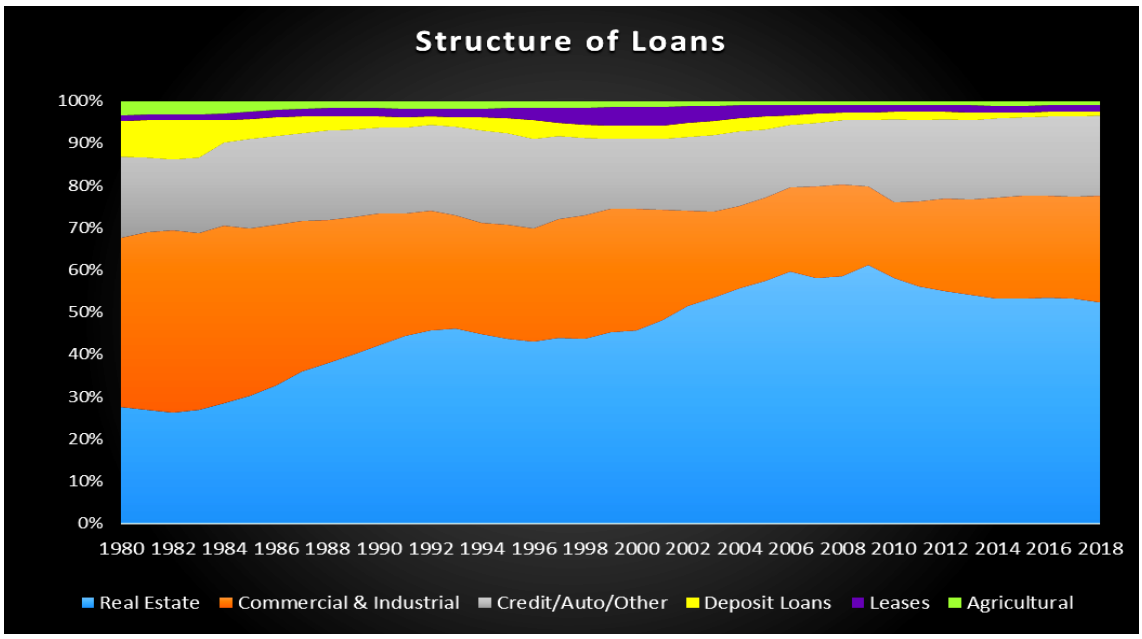

Figure 6: US Banks, Structure of Loans (1980-2019) (Source: FDIC)

Figure 6 demonstrates the different types of loans that are included in the bank's portfolio.

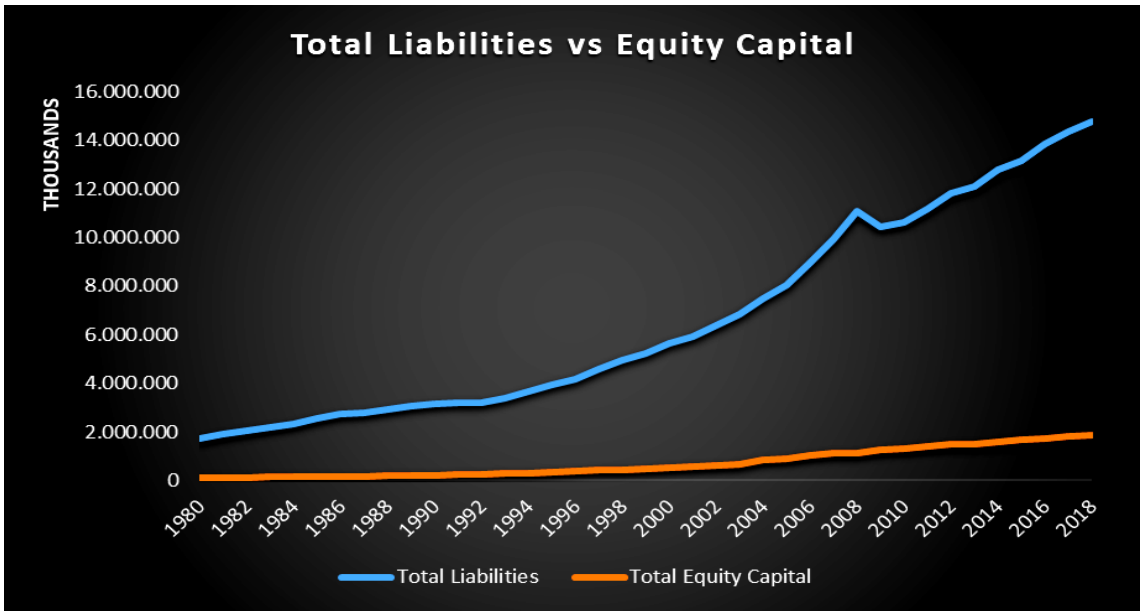

Figure 7: US Banks, Liabilities vs Equity (1980-2019) (Source: FDIC)

Figure 7 compares the size of Liabilities and Equity Capital for US Banks.

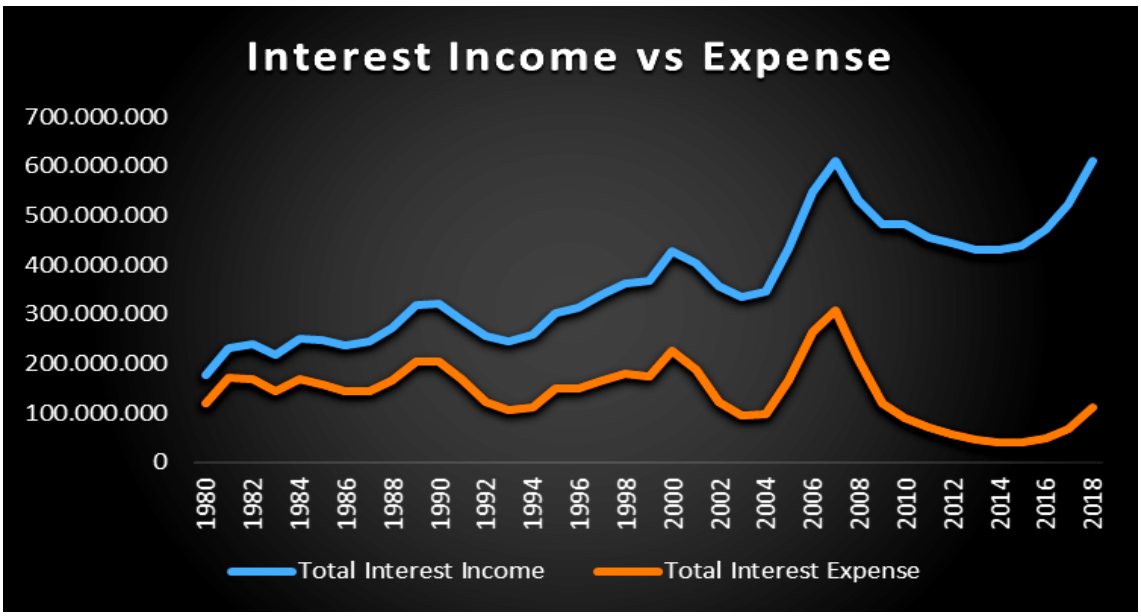

Figure 8: US Banks, Interest Income Vs Expense (1980-2019) (Source: FDIC)

Figure 8 compares Interest Income with Interest Expense for US Banks

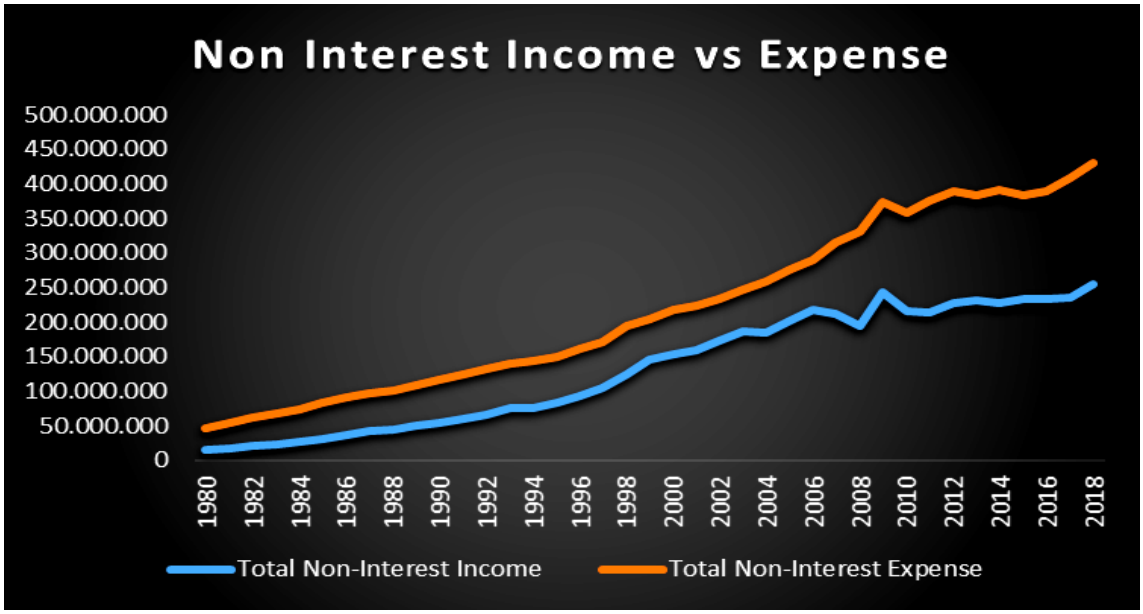

Figure 9: US Banks, Non-Interest Income Vs Expense (1980-2019) (Source: FDIC)

Figure 9 compares Non-Interest Income with Non-Interest Expense for US Banks

3.3. Data and Sampling

This study is based on a sample of 118 banks that constitute the larger US Banks in 2018. The inclusion of banks in the sample was based on the following criteria. First, in terms of specialization, I have opted to include only Bank-Holding companies to eliminate duplicates and incorporate numbers that represent the full range of their activities. Second, in terms of Size, I have opted for banks that hold more than 10 billion Assets. This number initially constituted the threshold of Dodd-Frank Act that subjected these banks to rigorous regulatory oversights and stress testing to reduce systemic risk. When banks exceed this threshold, their compliance costs substantially increase, and as a result, their profitability can be adversely affected. Lastly, I have opted for Listed companies to examine the effect of complementarity or substitutability between bank-based and market-based financing.

The financial data has been mostly obtained through the Bankscope database. The timespan and the Scope of the sample are revolving around the period of 20 years (1999-2018) to investigate how catalysts like the Deregulation, Recession of 2008, and the Dodd-Frank Act of 2010 impacted the profitability of US major banks. The Bankscope database has provided most of the data used for the Bank-specific variables. Additionally, data for the Industry-specific, Macroeconomic variables and Graphs has been obtained through official US and Global databases such as the FDIC, FRED, World Bank, Thomson Reuters Eikon and OECD. The author has proceeded in relevant calculations, combinations, and adjustments of specific variables where needed in order to include those variables in the model effectively.

3.4. Methodology

In regards to the Econometric model in line with the extant literature, I have opted for panel analysis. A panel regression model is apt to deal with a sample that is composed of cross-sectional and time-series data. According to (Baltagi, 2005), the value of utilizing such a model lies to the fact that it takes into consideration unobservable heterogeneity by incorporating individual-specific variables. In addition, the model offers increased variability, degrees of freedom, efficiency while reducing collinearity among variables. When examining this data, the tendency in literature is to employ Fixed or Random Effects models.

The fixed-effect model accounts for more observations, and it specifically focuses on the effect of time-varying variables on the Dependent variables. Each entity is assumed to present its specific characteristics that can potentially influence the Dependent variables. The fixed-effect model uncovers these relationships. The time-invariant characteristics are assumed to be unique and thus uncorrelated with other individual characteristics and are explored through the intercept, also known as a fixed effect (Hill et al., 2012; Baltagi, 2012). From the other side, the Random effects model considers the variation between model parameters as random and uncorrelated. It uses a different pool of populations to infer results from and allows for time-invariant characteristics. The decision to use a fixed or random-effects model is derived through the use of a specialized test known as Hausman that mostly tests whether the different error terms are correlated with the regressors.

As far as my methodology is concerned, I transformed my dataset to Panel, and I have concluded through various tests that the Fixed effects model is the second most suitable method for my dataset. The specifics of my methodology and the results of the tests will be discussed in the respective section. For all relevant regressions and tests, the specialized statistical software of Stata has been used. The following sections will briefly analyze the specified model and the variables used along with their expected effects.

3.5. Model Specification

Based on Torres-Reyna, O. (2007) a conventional fixed effects model with entity and time effects is specified:

$$Yit = \beta 0 + \beta 1X1it + \ldots + \beta kXkit + \gamma 2E2 + \ldots + \gamma nEn + \delta 2T2 + \ldots + \delta tTt + uit$$

Where

–Yit is the dependent variable (DV) where i = entity and t = time.

–Xkit represents independent variables (IV)

–βk is the coefficient for the IVs,

–uit is the error term

–En is the entity n. Since they are binary (dummies), we have n-1 entities included in the model.

–γ2 is the coefficient for the binary regressors (entities).

–Tt is time as a binary variable (dummy), so we have t-1 time periods.

–δ t is the coefficient for the binary time regressors.

For instance, the applied model in this study would be transformed as follows:

$$ROAit = \beta 0 + \beta 1Bspecit + \beta 1Indspecit + \beta 1Macroit + \gamma 2E2 + \gamma nEn + \delta 2T2 + \delta tTt + uit$$

- Yit is the dependent variable (ROA or ROE or NIM) where i = entity and t = time.
- β1Bspecit represents a vector of Bank-specific variables
- β2Indspecit represents a vector of Industry-specific variables
- β3Macroit represents a vector of Macroeconomic variables

3.6. Bank-specific variables

Asset Quality

The quality of the Assets significantly concerns executives as Loans constitute the majority of a bank's Balance Sheet, and they represent the primary source of Interest Income. Subsequently, an increased amount of NPL's can create a pool of liabilities that do not produce cash flows, forcing banks to trigger procedures such as Charge-offs, Write-offs, Recoveries, and Foreclosures. In turn, administrative costs increase and income is diminished. Additionally, the bad quality of Assets can result in credit rating downgrades that hurt the reputation of banks and force them to restrict future credit supply. Rising amounts of NPL's can affect the economy and vice versa.

Asset Structure

The rationale behind Asset Structure is relatively akin to that of Asset Quality. More specifically, the profitability and the solvency of banks rely on effectively and efficiently organizing its structure in terms of Assets and Liabilities. It is reasonably safe to assume that through holding a larger amount of loans and investments, banks can produce higher returns. However, a strategy of overinvesting into income-earning assets can be in detriment of repaying depositors and also involves increased credit risk. In this context managing and holding sufficient liquidity for safety purposes is of paramount importance. Thus, this balance in Structure between holding loans and retaining Liquidity can significantly determine the profitability of banks.

Capital Strength

The degree of Capital strength is another critical factor that can determine the profitability of a bank. It can be assumed that well-capitalized banks benefit from increased creditworthiness and lower risk of funding, thus lower cost of capital (Athanasoglou, 2008). Furthermore, increased Equity Capital can signal strong stability and the ability to safeguard deposits (Ghosh, 2016; Berger, 1995).

In turn, those banks can attract more deposits and capitalize on favorable circumstances in markets to improve their profitability margins (Bourke 1989; Demirguc-Kunt and Huizinga 1999; Goddard et al. 2004.). Lastly, capital adequacy can act as a cushion that can be critical in absorbing crises and shocks, especially for larger banks (Aebi et al. 2012).

Credit Risk

According to Adelopo, Lloydking, and Tauringana (2017), banks experience Credit Risk in two cases: when the default risk on loans is high and when they are prone to bank runs due to lack of reserves or insolvency issues during credit crunches. The effect of these cases is similar to that of Asset Quality, but in this case, as I use the loan loss reserves as a proxy of the credit risk, it can be inferred that those non-interesting bearing reserves represent a type of indirect tax. In particular, as banks are forced to hold an amount of cash for emergency purposes, this amount acts as a stationary idle "contra asset" that cannot be utilized for-profits, thus drag down profitability. Finally, a high amount of loan loss reserves can negatively affect the credit rating of a bank.

Deposits

Deposits constitute a major source of Stable Funding that banks use to support the origination and distribution of loans. Attracting demand for deposits can lead to increased market opportunities but also to agency problems that arise from the insurance provided by the federal government that essentially can induce moral hazard (Berger, 1995). Moreover, deposits are associated with the Asset Structure, and Asset Quality of banks as these factors determine whether the bank can effectively transform the deposit Liabilities to Income Earning Assets.

Efficiency

Efficiency in banking generally refers to better managing the operating expenses to improve quality and speed of service, internal processes, and boosting profits. On the topic of operating expenses, the literature suggests that increased efficiency requires better management; thus, a higher cost is incurred. Additional financial resources are needed to attract superior experienced executives and to invest in "change" most likely through high-cost investments in technology. However, another explanation suggests that banks are capable of shifting costs to customers through low deposit rates, high loan rates, and servicing fees.

Liquidity

The Effect of Liquidity on profitability can be ambiguous. On the one hand, the careless management of liquidity can lead to bankruptcy exposure (Moyer et al., 2005). On the other hand, holding excessive levels of liquidity can indicate the absence of growth opportunities and the inefficient use of capital.

Size

The size of banks is a factor that has been extensively explored in the literature, and the results are quite unclear and ambiguous. On the one side, proponents of the positive effect (Short,1979; Smirlock 1985; Miller and Noulas, 1996; Demirguc-Kunt and Huizinga, 2000; Bikker and Hu, 2002 and Goddard et al. 2004; Athanasoglou et al., 2008) suggest that larger banks are better capitalized and through this lower cost and risk of their capital they improve profitability margins. Additionally, larger banks manage to achieve an increased degree of diversification in their product and loan portfolios that, in turn, boost their profitability (Smirlock, 1985). Lastly, through their expansionary and technological investments, their geographic reach, their extensive clientele, and their interconnection with financial markets, larger banks develop asymmetric information advantages. Overall, these factors suggest benefits from economies of scale.

From the other side, the opposing view (Berger, 1987; Molyneux and Thornton 1992) suggests that size creates diseconomies of scale effects for larger banks. The higher cost of expansion through branching and the increased operating, bureaucratic, and compliance costs, especially after the Dodd-Frank Act, drag down profitability.

Reputation

The Reputation of banks is an underused factor as it is relatively tricky to incorporate it as a variable in regressions quantitatively. I opted for a proxy using the logarithm of Goodwill. The years of the bank's activity, the stock market prices, and the credit ratings could be alternatively used as proxies. The rationale for this choice can be traced to the concept of persistence (Berger, 2006). According to Goddard et al., 2004 and Memmel and Raupach, 2010 this persistence in profits can be attributed to "competitive barriers to entry, regulatory capital requirements, informational opacity and sensitivity to external shocks given serial correlation among them."

Diversification

The rationale behind the choice of diversification is based on the view of Albertazzi, Gambacorta (2006) that suggest that "structural changes such as the deregulation, financial innovation, and new information technologies reinforced the importance of fee-income generating activities."

Systemic Risk

In the aftermath of the Recession of 2008, the scope of regulation has shifted towards macro-prudential regulation that aims to reduce systemic risk in banking.
During the Recession of 2008, a particularly alarming situation occurred when banks found themselves trapped in an interbank credit crunch. Thus, interbank exposure serves as a proxy for measuring the systemic risk of large banks and how those exposures affect their profitability.

3.7. Industry-specific variables

Concentration

Concentration is another variable that is closely associated with Size and has created confusion among academics as the effect is also quite ambiguous. The debate among academics revolves around two significant hypotheses, namely the Market-Power (MP) hypothesis also known as the Structural-Conduct-Performance hypothesis (SCP) and the Efficient-Structure(ES) hypothesis. On the one hand, the MP hypothesis suggests that firms with substantial market power dynamics can generate monopolistic profits. A particular case of MP known as Relative-Market-Power (RMP) suggests that only firms with increased market share and a high degree of product differentiation can entrench their position and earn those monopolistic profits.

On the other hand, the X-efficiency version of the ES (ESX) hypothesis suggests that improved efficiency in terms of superior management and scale benefits can result in heightened concentration and subsequently to bigger profits. In regards to the effect of concentration, the literature presents mixed findings (Smirlock, 1985; Bourke, 1989; Molyneux and Thornton, 1992; Berger, 1995; Demirguc-Kunt and Huizinga, 1999; Mamatzakis and Remoundos, 2003; Staikouras and Wood, 2004). For this study, I used the 5 bank concentration as a proxy, but given the results from Herfindahl–Hirschman Index that indicate that competition is evident in the US Banking industry, I expect the effect to be negative.

Market Capitalization to GDP

An intensified stock market development expands the informational advantages of large banks in a way that enables them to attract additional business, better monitor customers, and improve their profitability margins. This variable intends to examine whether the depth of financial markets and the disintermediation process that is evident after 1980 compete with bank financing., Essentially, the focus is on exploring the relationship between bank-based and market-based financing in terms of Complementarity or Substitutability hypotheses.

Stock Market Volatility

According to the dealership model of Ho and Saunders (1981) and Angbazo (1997), the interest on loans is more dependent on volatility rather than on deposits. The rationale behind this view is based on the fact that during periods of high uncertainty, e.g. shocks, crises the transaction volumes in financial markets tend to multiply. For instance, we can observe demand for financial derivatives for hedging purposes or stocks sell-offs.

Bank Lending to GDP

This variable captures the importance of bank-financing in the economy. A low level can show strong signs of disintermediation and market-oriented financing. Additionally, if the contribution is high, we could expect intensified competition in the industry.

Bank Assets to GDP

This is another variable that captures the overall level of banking development. A high ratio can again showcase interbank rivalry in advanced financial markets hence a negative impact on profitability.

Bank Assets to Market Capitalization.

This variable suggests that banks and markets can either be complements or substitutes in terms of debt or equity financing. The level of this ratio can showcase whether the economy is market-based or bank-based.

Capital Adequacy

This variable differs from Capital Strength since it takes into account the overall level of risk-based capital factors that were introduced after 2010 with the enactment of the Dodd-Frank Act. Data for regulatory capital ratios of individual units is only available after 2010, so I use this as a generic proxy to measure the effect of regulatory capital on profitability.

Productivity

This variable is used to measure the contribution of labor productivity on the Net Income of banks. As banks follow the pace of financial innovation, their workforce needs to employ best practices and specialized knowledge to add value continually. Banks that manage to accomplish this objective and use their workforce as a competitive advantage can potentially earn bigger profits.

Tax

Regarding the effect of Corporate Tax Rate on profitability Ash Demirgiic, -Kunt and Harry Huizinga (1998) claim that it has an adverse effect on a bank's saving and investment decisions and decreases their profitability. Albertazzi and Gambacorta (2009) support that banks can transfer their tax burdens to customers through the levels of deposit, lending, and fee rates.

Deregulation

The effect of Deregulation has been extensively analyzed in the literature review. As a proxy, I use a dummy variable. The value of 0 accounts for the years of Deregulation in the banking industry, whereas the value of 1 accounts for the years of Regulation.

Crisis

Likewise, a dummy variable is used for the effect of the crisis. The value of 0 accounts for standard years and the value of 1 for the crisis.

3.8. Macroeconomic variables

Real GDP

The use of Real GDP examines whether the bank profits are of procyclical or countercyclical nature. An increase in GDP potentially brings about an increase in consumer and business spending hence increased opportunities for credit supply. Alternatively, GDP growth can potentially signify interbank competition.

Inflation

According to Revell (1979) and Perry (1992), the effect of inflation on banks is dependent on whether banks can accurately anticipate and forecast its level. The banks that act swiftly are capable of proceeding to necessary adjustments to the levels of their interest rates, so those will exceed the increases in their operating costs and hence lead to higher profits. Furthermore, inflation is considered to be associated with larger volumes of transactions.

Money Market Rate

As short-term rates increase, we can expect that the cost of borrowing for banks also increases. Moreover, for customers, the current and future lending possibility, the default probability, and the ability to repay outstanding debt turn into burdensome.

Long-Term Rate

The long-term rate can positively impact profitability as banks can benefit from the spread between short-term and long-term rates as they primarily engage in maturity transformation activities. Moreover, the long term rates depict future business cycle expectations, and if those are optimistic, banks can reduce their provision levels.

Prime Rate

The use of the Prime Rate can shed light on the effect of the Federal Funds Rate on the profitability of banks. The Prime Rate, which is primarily determined by the Federal Funds Rate, is the rate that banks charge their most creditworthy customers and also serves as the benchmark rate for a variety of other bank rates. Therefore, a rising Prime Rate can influence the whole spectrum of bank's activities and generate higher profitability.

Unemployment

The Effect of Unemployment on bank's profitability is linked with inflation. As those two are inversely correlated in periods of high unemployment, banks do not need to increase wages, whereas, in periods of low unemployment, they need to increase the wages to attract the best employees. However, the level of unemployment can also serve as an indicator of future economic expectations; thus, high unemployment can coincide with recessions in which the activities of banks decrease and hence their profitability.

Table 1: Variables, Notations, Proxies& Expected effects

Category	Variable	Notation	Proxy	Expected effect
Dependent Variables	Return on Assets	ROA	Net Income/Average Total Assets	
	Return on Equity	ROE	Net Income/Average Total Equity	
	Net Interest Margin	NIM	Interest Income-Interest Expenses/ Average Earning Assets	
Bank-specific variables	Asset Quality	ASSETQ	NPL/Gross Loans	-
	Asset Structure	ASSETST	Net Loans/Total Assets	+
	Capital Strength	CAPSTR	Equity/Total Assets	+
	Credit Risk	CRED	Loan Loss Reserves/Gross Loans	-
	Deposits	DEP	Deposits/Total Assets	+
	Efficiency	EFFIC	Cost/Income	-
	Liquidity	LIQ	Liquid Assets/Deposits & Stable Funding	-
	Size	SIZE	Natural Logarithm of Total Assets	-
	Reputation	REP	Natural Logarithm of Goodwill	+
	Diversification	DIVERSF	Non-Interest Income/Operating Revenues	+
	Systemic Risk	SYSTEMR	Interbank Assets/Interbank Liabilities	-
Industry-specific variables	Concentration	CONC	5-Bank Asset Concentration	-
	Market Cap to GDP	MCGDP	Market Capitalization/GDP	+
	Stock Market Volatility	SMVOL	CBOE Volatility Index: VIX	-
	Bank Lending to GDP	BLGDP	Domestic Credit to Private Sector/GDP	-
	Bank Assets to GDP	BAGDP	Bank Assets /GDP	-
	Bank Assets to Market Cap	BAMC	Bank Assets /Market Capitalization	-
	Capital Adequacy	CAD	Regulatory Capital/Risk-Weighted Assets	-
	Productivity	PROD	Net Income/Number of Employees	+
	Tax	TAX	Tax/Pre-tax Profits	-
	Deregulation	DEREG	Dummy variable 0,1	+
	Financial Crisis	CRISIS	Dummy variable 0,1	-
Macroeconomic variables	Real GDP	RGDP	Real GDP ,Growth Annual %	+
	Inflation	INFL	Inflation, consumer prices Annual %	+
	Money Market Rate	MONMR	3-Month Treasury Bill: Secondary Market Rate, Annual %	-
	Long Term Rate	LTR	Long-Term Government Bond Yields: 10-year Annual %	+
	Prime Rate	PRIMR	Bank Prime Loan Rate, Annual %	+
	Unemployment	UNEMPL	Unemployment Rate, Annual %	-

4. Empirical Results

4.1. Descriptive Statistics

The following table depicts Descriptive Statistics for the sample of the study.

Table 2: Descriptive Statistics

variable	mean	sd	min	max	variance	skewness	kurtosis	N
ROA	1.05	1.11	-15.04	15.19	1.24	1.74	74.08	1864.00
ROE	11.97	32.84	-96.17	998.89	1078.23	19.08	489.06	1861.00
NIM	3.65	1.69	-4.50	20.68	2.86	3.87	35.39	1858.00
ASSETQ	0.02	0.02	0.00	0.41	0.00	7.67	105.04	1785.00
ASSETST	0.62	0.17	0.00	0.95	0.03	-1.50	5.51	1848.00
CAPSTR	0.11	0.05	-0.00	0.85	0.00	7.48	87.43	1864.00
CRED	0.01	0.01	0.00	0.13	0.00	4.70	40.83	1837.00
DEP	0.80	0.36	0.00	7.16	0.13	7.82	113.06	1827.00
EFFIC	0.63	0.14	0.08	2.07	0.02	1.22	15.67	1857.00
LIQ	0.16	0.46	0.00	7.67	0.21	9.07	114.08	1843.00
SIZE	7.27	0.76	5.38	9.53	0.58	0.74	3.56	1864.00
REP	12.57	2.26	2.89	18.27	5.09	-0.24	4.07	1743.00
DIVERSF	0.33	0.22	-0.99	2.04	0.05	1.17	7.24	1863.00
SYSTEMR	1.29	1.86	0.00	9.97	3.47	2.18	7.92	1481.00
CONC	0.41	0.07	0.28	0.48	0.01	-0.77	1.94	2360.00
MCGDP	1.30	0.21	0.79	1.65	0.04	-0.70	2.81	2360.00
SMVOL	0.10	0.45	-0.46	1.30	0.20	1.25	3.82	2360.00
BLGDP	0.52	0.03	0.47	0.60	0.00	0.92	3.15	2360.00
BAGDP	0.74	0.10	0.56	0.84	0.01	-0.44	1.58	2360.00
BAMC	0.59	0.15	0.39	1.05	0.02	1.41	5.09	2360.00
CAD	0.11	0.01	0.08	0.13	0.00	-0.25	1.73	2360.00
PROD	0.08	0.38	-2.41	11.35	0.15	22.45	612.71	1851.00
TAX	0.28	0.83	-25.38	9.78	0.69	-16.42	593.71	1605.00
DEREG	0.55	0.50	0.00	1.00	0.25	-0.20	1.04	2360.00
CRISIS	0.20	0.40	0.00	1.00	0.16	1.50	3.25	2360.00
RGDP	0.02	0.03	-0.08	0.07	0.00	-2.04	8.82	2360.00
INFL	0.02	0.01	-0.00	0.04	0.00	-0.72	3.15	2360.00
MONMR	0.02	0.02	0.00	0.06	0.00	0.95	2.57	2360.00
LTR	0.04	0.01	0.02	0.06	0.00	0.41	2.25	2360.00
FEDFR	0.02	0.02	0.00	0.06	0.00	0.96	2.51	2360.00
PRIMR	0.05	0.02	0.03	0.09	0.00	0.85	2.28	2360.00
UNEMPL	0.06	0.02	0.04	0.10	0.00	0.91	2.57	2360.00

According to Table 2 for the banks of our sample, the mean of ROA is 1.05, of ROE 11.97, and NIM 3.65. ROA and NIM do not present large standard deviations (1.11 and 1.69) ROE exhibits a large standard deviation of 32.84. The minimum ROA is -15.04, and the maximum is 15.19. The minimum ROE is -96.17 and the maximum ROE is 998.89. Minimum NIM is -4.50 and the maximum NIM is 20.68. The independent variables generally have low mean values with low standard deviations. The number of observations for profitability measures and bank-specific variables varies from 1481 to 1864. The Industry-specific and Macroeconomic variables are fixed at 2360 observations as they are repeated values across years with the exceptions of Productivity and Tax that have been calculated for every individual bank based on available data.

4.2. Correlation Matrix

Table 3 presents the Correlation Matrix for the variables used in our model.

Table 3: Correlation Matrix

	ROA	ROE	NIM	ASSETQ	ASSETST	CAPSTR	CRED	DEP	EFFIC	LIQ	SIZE	REP	DVERSF	SYSTMR	CONC	MCGDP	SMVOL	BLGDP	BAGDP	BAMC	CAD	PROD	TAX	DEREG	CRISIS	RGDP	INFL	MONMR	LTR	FEDFR	PRIMR	UNEMPL
ROA	1.00																															
ROE	0.91	1.00																														
NIM	0.25	0.22	1.00																													
ASSETQ	-0.39	-0.40	-0.02	1.00																												
ASSETST	-0.01	-0.02	**0.53**	-0.06	1.00																											
CAPSTR	0.10	-0.23	0.07	0.01	0.01	1.00																										
CRED	-0.35	-0.33	0.19	**0.61**	-0.04	-0.07	1.00																									
DEP	0.05	-0.02	0.36	-0.04	**0.80**	0.17	-0.06	1.00																								
EFFIC	-0.42	-0.42	-0.24	0.04	-0.14	0.05	-0.04	-0.06	1.00																							
LIQ	-0.04	-0.02	-0.52	0.08	**-0.63**	-0.08	-0.11	-0.32	0.22	1.00																						
SIZE	-0.03	-0.03	-0.40	0.20	-0.39	-0.03	0.20	-0.13	-0.03	0.44	1.00																					
REP	0.01	-0.09	-0.28	0.12	-0.31	0.25	0.12	-0.07	-0.03	0.30	**0.84**	1.00																				
DIVERSF	0.12	0.12	-0.46	-0.00	-0.53	0.02	-0.08	-0.24	0.41	0.55	0.44	0.36	1.00																			
SYSTEMR	-0.05	-0.11	-0.17	0.08	-0.19	0.17	-0.02	-0.02	0.12	0.28	0.22	0.16	0.20	1.00																		
CONC	-0.25	-0.39	-0.27	0.26	-0.01	0.39	0.01	0.00	0.15	0.05	0.22	0.31	-0.05	0.24	1.00																	
MCGDP	0.29	0.26	-0.04	-0.36	0.05	0.05	-0.42	0.03	-0.04	0.01	0.04	0.03	-0.03	0.08	-0.01	1.00																
SMVOL	0.01	-0.04	-0.05	-0.12	0.07	0.10	-0.18	0.08	0.00	-0.01	0.07	0.11	-0.07	0.03	0.26	0.03	1.00															
BLGDP	-0.17	-0.14	-0.06	-0.02	0.11	-0.07	0.01	0.11	-0.01	-0.06	-0.01	0.08	-0.00	-0.10	0.23	-0.31	0.34	1.00														
BAGDP	-0.29	-0.44	-0.29	0.26	-0.01	0.43	0.00	0.01	0.17	0.06	0.22	0.30	-0.05	0.27	**0.95**	-0.04	0.23	0.16	1.00													
BAMC	-0.40	-0.45	-0.11	0.42	-0.04	0.15	0.35	-0.00	0.12	0.01	0.07	0.11	-0.00	0.05	0.45	**-0.86**	0.16	0.40	**0.51**	1.00												
CAD	-0.24	-0.36	-0.22	0.38	-0.06	0.34	0.15	-0.06	0.11	0.06	0.19	0.25	-0.02	0.23	**0.85**	-0.02	-0.16	-0.05	**0.78**	0.31	1.00											
PROD	**0.66**	**0.57**	-0.10	-0.26	-0.12	0.10	-0.36	-0.04	**-0.50**	0.22	0.24	0.19	-0.03	0.13	0.15	0.34	0.15	-0.14	0.12	-0.25	0.10	1.00										
TAX	-0.06	-0.03	0.01	-0.06	-0.04	0.04	-0.05	-0.03	-0.00	0.01	-0.01	0.04	0.05	-0.08	-0.04	0.03	-0.02	-0.01	-0.04	-0.04	-0.01	-0.07	1.00									
DEREG	0.07	0.22	0.21	-0.19	0.06	-0.41	0.06	0.05	-0.13	-0.08	-0.20	-0.23	0.06	-0.29	**-0.74**	-0.26	-0.08	0.40	**-0.75**	-0.09	**-0.75**	-0.29	0.02	1.00								
CRISIS	-0.28	-0.24	-0.02	0.13	0.04	-0.10	0.19	0.04	0.03	-0.04	-0.04	-0.02	0.02	-0.13	-0.05	-0.42	0.21	**0.54**	0.02	0.41	-0.18	-0.31	-0.01	0.48	1.00							
RGDP	0.20	0.23	0.07	-0.04	-0.04	-0.11	-0.02	-0.08	-0.11	0.01	-0.04	-0.07	0.02	-0.03	-0.22	0.48	-0.40	-0.42	-0.35	**-0.62**	0.13	0.10	0.07	0.00	-0.37	1.00						
INFL	0.15	0.22	0.14	-0.19	0.06	-0.21	-0.08	0.05	-0.06	-0.04	-0.09	-0.09	-0.02	-0.15	-0.28	-0.08	0.40	0.35	-0.39	-0.02	-0.54	-0.01	-0.01	0.37	0.03	-0.21	1.00					
MONMR	0.30	0.42	0.18	-0.37	0.09	-0.32	-0.22	0.06	-0.15	-0.05	-0.13	-0.16	0.01	-0.19	-0.57	0.42	0.12	0.11	**-0.69**	**-0.62**	**-0.63**	0.04	0.03	0.56	-0.11	0.30	0.51	1.00				
LTR	0.23	0.38	0.25	-0.26	0.04	-0.42	-0.03	0.02	-0.17	-0.06	-0.20	-0.26	0.05	-0.27	**-0.85**	0.18	-0.18	-0.00	**-0.91**	-0.56	**-0.73**	-0.14	0.05	**0.79**	0.14	0.37	0.29	**0.78**	1.00			
FEDFR	0.28	0.40	0.18	-0.36	0.09	-0.32	-0.21	0.07	-0.15	-0.05	-0.13	-0.15	0.01	-0.20	**-0.55**	0.40	0.16	0.17	**-0.67**	-0.59	**-0.62**	0.02	0.03	0.58	-0.04	0.28	0.52	**0.99**	**0.78**	1.00		
PRIMR	0.21	0.34	0.19	-0.33	0.10	-0.34	-0.16	0.08	-0.12	-0.06	-0.15	-0.17	0.01	-0.23	**-0.60**	0.24	0.26	0.26	**-0.67**	-0.45	**-0.74**	-0.06	0.02	0.67	0.23	0.07	0.59	**0.91**	**0.78**	**0.93**	1.00	
UNEMPL	-0.31	-0.34	-0.06	**0.56**	-0.13	0.11	0.48	-0.11	0.09	0.04	0.05	0.06	0.03	0.06	0.36	**-0.60**	-0.38	-0.12	0.32	**0.60**	**0.64**	-0.22	-0.01	-0.28	0.07	0.08	-0.36	**-0.64**	-0.39	-0.63	-0.63	1.00

Table 3 indicates that there are signs of moderate and high correlation across variables in the model. According to the numbers, I decided to exclude the variable FEDFR (Federal Funds Rate) from the model due to an almost perfect correlation. I proceeded with no additional exclusions.

4.3. Robustness tests

To begin with, given the longitudinal nature of the sample, the initial approach was based on undertaking pooled OLS regressions. The dataset has been transformed into the appropriate "long-form" in order to conduct panel data analysis. I proceeded with producing reports about the description, summary, and the correlation matrix of the variables. Next, I performed pooled OLS regressions and several tests to determine whether the method of pooled OLS regressions is suitable for the sample.

Firstly, I accounted for heteroscedasticity through the use of the Breusch-Pagan/Cook-Weisberg test (estat hettest). The results pointed towards the presence of heteroscedasticity, thus suggesting the use of robust errors. Second, I accounted for omitted variables through the use of the Ramsey Reset test. The results suggested that there are omitted variables. Third, I accounted for model specification through the use of the linktest. The results suggested that the model is not correctly specified.

Fourth, I determined whether the use of a pooled OLS or a random-effects model is appropriate for my sample through the use of the Lagrange Multiplier (LM) test. The results suggested that a random-effects model is more appropriate and rendered the results of the pooled OLS biased. Fifth, I determined whether the use of fixed effects or random-effects model is more appropriate by using the Hausman test. The results of the Hausman test returned a negative value, so no results could not be inferred from its use. I proceeded with estimating a Hausman test with the sigmamore option and a robust Hausman test. Both results suggested that the use of a fixed-effects model is appropriate. I proceeded with estimating a fixed effects model using clustering to account for entity effects and heteroscedasticity. Then I used the testparm test to determine whether the incorporation of time effects is needed. The results suggested that time effects need to be incorporated into the model.

Given the results of the tests as mentioned earlier, I concluded that the use of a fixed model with entity and time effects is the most suitable, and this model was used to derive results from. Following these results, I used the Modified Wald Test to investigate the presence of Groupwise heteroscedasticity and the Wooldridge test for autocorrelation. The results suggested that heteroscedasticity and autocorrelation are evident in the model. Given the presence of these parameters, the results of the regression should be interpreted with relative caution. As mentioned in the section of limitations a more efficient and suitable way to derive precise results would be to employ Dynamic panel data regression through the System GMM method (Arellano, Bover/ Blundell-Bond estimation). Finally, I have used a unit root test to account for stationarity. According to results, stationarity exists.

4.4. Limitations

This dissertation is subject to several limitations. First, the scope of study only investigates the case of the United States and does not take into consideration other countries; hence, it does not account for cross-sectional country differences and global effects. Second, the model should be interpreted with caution as specific parameters influence the results. The approach of examining micro panels by utilizing fixed-effect models suffers from some conventional limitations.

In particular, the data has not undergone winsorization and standardization.

Further, the presence of group-wise heteroscedasticity indicates inconsistency and imprecision. The serial correlation suggests that the statistical significance of regressors coefficients is not entirely reliable. Endogeneity constitutes another apparent limitation that is a significant concern in this kind of study as it signals that the model is subject to omitted variable, simultaneity, selection, measurement error, and functional form misspecification bias. The most appropriate way to correct these issues and study this sample would be to employ a dynamic panel data model known as System Generalized Method of Moments(GMM). Finally, the sample is relatively narrow, and it could be further extended to incorporate small and medium-sized banks.

4.5. Regression results

Table 4 reports the empirical results of the specified model that utilizes ROA, ROE, and NIM as profitability variables.

Table 4: Regression results. ROA, ROE, NIM

Variable	ROA	ROE	NIM
Asset Quality	0.15	-9.65	5.28*
Asset Structure	-0.32	-2.21	2.59***
Capital Strength	2.84***	-42.46***	6.19***
Credit Risk	-9.20*	-115.74**	0.97
Deposits	0.50	3.80	0.06
Efficiency	-0.41	-4.98	-0.14
Liquidity	-0.05	-1.58	-0.63
Size	-0.40**	-2.61	-0.32
Reputation	0.03	0.05	0.06
Diversification	1.07***	13.27***	-1.31**
Systemic Risk	-0.03**	-0.17	-0.00
Concentration	-6.20**	-65.78	-4.42
Market Cap/GDP	-1.72***	-18.06*	-0.85
Stock Market Volatility	0.07	0.31	0.04
Bank Lending/GDP	-2.28	-94.40	-15.59*
Bank Assets/GDP	5.02*	43.39	-0.84
Bank Assets/Market Cap	-3.54**	-30.05	-0.16
Capital Adequacy	6.44	427.22	68.91
Productivity	14.87***	140.73***	2.79**
Tax	-0.02	-0.01	0.03*
Deregulation	0.46*	7.98**	0.77*
Financial Crisis	-0.33**	-3.12	-0.14
Real GDP	-0.70	-39.46	-6.39*
Inflation	9.23	205.01*	24.30*
Money Market Rate	-11.42	-268.90	-35.97*
Long-Term Rate	-0.95	127.49	29.79
Prime Rate	11.81	252.58*	29.90*
Unemployment	5.16	-85.16	-21.48
Constant	5.20***	51.82***	6.34***
N	1197	1196	1197
r2	0.87	0.84	0.45
r2_a	0.87	0.84	0.43

legend: * p<0.05; ** p<0.01; *** p<0.001

Starting with ROA on bank-specific variables, we observe that Capital Strength is significant and positively related to ROA. This finding is consistent with Bourke (1989), Berger,1995; Demirguc-Kunt and Huizinga (1999), Abreu and Mendes (2002), Staikouras and Wood, 2003; Goddard et al. (2004), Naceur and Goaied (2001, 2008) Stiroh and Rumble, 2006 and Pasiouras and Kosmidou (2007) and García-Herrero et al. (2009). This finding shows that well-capitalized banks present higher profitability due to benefits derived from increased market opportunities, creditworthiness, lower cost of funding, and endurance to crises.
Next, Credit Risk is found to be negatively and significantly related to ROA in line with Bourke (1989), Molyneux and Thornton (1992), Miller and Noulas (1997), and Athanasoglou et al. (2008). Banks that hold excessive capital for their Loan Loss Reserves deprive themselves of opportunities to profit through utilizing this cash to engage in additional loans and investment activities.

In regards to Size, the effect is negative and significant, demonstrating that large banks experience diseconomies of scale effects. This result is in line with the findings of Berger et al., 1987; Goddard et al. 2004; Micco et al., 2007 Ben and Goaied, 2010; Dietrich and Wanzenried, 2014) Then, we find that Diversification has a significant positive impact on ROA. This result proves that after 1980, the importance of non-interest income generated through fees and other forms of service for banks substantially augmented. Banks are relying more and more on these activities to generate additional income as the interest income is suffering from a low-interest-rate environment. However, the Dodd-Frank Act has imposed stringent regulation on non-interest income activities.

Another variable that is found to be negatively and significantly correlated with ROA is Systemic Risk. In particular, this variable is measured by the level of interbank exposure. The results suggest that the profitability of banks is dragged down by excessive interbank liabilities. Potentially, excessive interbank liabilities can be attributed to a lack of capital to fill in mandatory reserves, diversification purposes, and over engaging in overnight repo transactions. The implications can be quite severe as banks might face regulatory scrutiny, trust issues, and distress concerns.

Turning to the Industry-specific variables, we find evidence that Concentration has a negative and significant effect on ROA. This negative relationship is in line with the findings of Berger (1995), Boone, J., Weigand, J., 2000 Athanasoglou, Brissimis, and Delis (2005) and Ameur and Mhiri (2013). This result demonstrates that competition significantly restrains the profitability margins as banks compete to grasp market share. Notably, in the case of the US, a handful of large banks accumulate the majority of the market share; hence, the degree of competition is very intense.

Further, we find that Market Capitalization to GDP has a significant negative relationship with ROA in line with Ash Demirgiic, -Kunt, and Harry Huizinga (1999). This result suggests that when the economy experiences disintermediation, meaning that market-based financing is more dominant, banks lose opportunities. This finding seems to verify the Miller-Modigliani theorem of substitutability hypothesis and implies that the informational advantages that large banks might derive from a strong stock market development are subject to limitations.

Referring to Bank Assets to GDP, there is a significant positive relationship with ROA. This finding hints that as large banks increase the size of their income-earning asset portfolio, they can establish their position and boost their profits. More specifically, when the overall amount of assets managed by banks is gradually growing, this tendency points to a booming economy. A booming economy brings about increased demand for credit supply and banking products.

The relationship between Bank Assets and Market Capitalization is reported as negative and significant in line with Ash Demirgiic, -Kunt, and Harry Huizinga (1999) and suggests substitutability hypothesis. This result demonstrates that the excessive growth of the banking industry can be a detriment to profitability margins. As banks accumulate assets, the operating costs increase, and a deteriorating quality of these assets in terms of overvaluation or illiquidity can prove to be problematic. Also, the development of intense interbank competition can influence margins. In an optimal setting, a strong stock market development represents a prosperous real economy that immensely contributes to the overall economic growth.

We also find evidence that Productivity positively and significantly affects ROA. The banks that effectively and efficiently utilize their workforce can earn higher profits. Finally, in regards to the effects of Deregulation and Crisis, we find that they have positive and negative significant relationships, respectively. These findings coincide with the literature review and demonstrate that deregulation enables the banking sector to magnify in size and generate exorbitant profits. On the other side, a crisis puts a handbrake on these momentums and weakens the profitability of the sector.

In regards to the results of ROE, we observe three differences. First, the effect of Capital Strength on ROE is negative and significant. This finding is consistent with the efficiency-risk hypothesis proposed by Berger and Bonaccorsi di Patti (2006). The hypothesis associates higher leverage or lower equity with higher profit efficiency and higher returns. In turn, those returns substitute equity capital and protect firms from bankruptcy and financial distress costs.

On the other side, high levels of equity capital in banks affect the risk-taking behavior of its management. In particular, an equity-based capital structure prompts the bank's executives to showcase risk-averse behavior. As the available capital stems from shareholders, it is becoming more difficult for managers to engage in riskier activities that generate higher returns due to fear of failure and loss. The higher levels of equity support the franchise-value hypothesis in which economic rents have to be protected against the danger of liquidation. In other words, more efficient firms choose to retain high levels of equity to safeguard franchise value.

Second, Inflation is found to be positively and significantly associated with ROE in line with Bourke, 1989; Claessens et al., 1998; Demirguc-Kunt and Huizinga, 1999, Molyneux and Thornton,1992, Guru, Staunton and Balashanmugam (2002), Athanasoglou, Brissimis and Delis (2005), Flamini et al. (2009), Ahokpossi (2013), Dietrich and Wanzenried (2014). This finding is consistent with the idea that banks that proceed to swift adjustments to combat inflation changes can generate higher profits. Lastly, the relationship between ROE and Prime Rate is positive and significant, indicating that a hike in the Prime Rate affects all rates charged by banks in a way that increases spreads and boosts profits.

Finally, turning to NIM, we observe some differentiation as well. To begin with, NIM is positively and significantly influenced by Asset Quality. This result contradicts the initial expectation as we would expect a rising NPL level to erode profitability. The result is only significant at a 95% confidence interval and hints that our model is potentially not correctly specified. Further, we find evidence that Asset Structure has a significant positive effect on NIM. This result is rational because as the number of Loans increases, banks can accumulate more interest payments.

Next, we find that Diversification is negatively and significantly related to NIM. This finding is expected as profitable non-interest income activities would reduce the profitability of interest-income activities. Concerning the effect of Bank Lending to GDP on NIM, it is negative and significant in line with Ash Demirguc-Kunt and Harry Huizinga (1999), highlighting that as demand for credit heightens vigorous interbank competition emerges. The effect of Tax on NIM is positive and significant in line with Ash Demirguc-Kunt and Harry Huizinga (1999), implying that banks can shift tax burdens to their customers through the level of their rates.

Next, the effect of Real GDP on NIM is negative and significant in line with Staikouras and Wood (2003), suggesting that in developed countries, interbank competition intensifies and reduces profits and interest margins. Finally, we observe that the effect of the Money Market Rate on NIM is negative and significant. This finding is consistent with the financial instability hypothesis (Fisher, 1933; Minsky, 1975;1982; Kindleberger, 1978). The result potentially indicates that short-term rate hikes increase the short term funding cost of banks. Also, the outstanding debt payments and default risk of borrowers heighten along with their ability to further lend.

5. Conclusions

This dissertation at first aimed at providing a holistic view of the periods of Deregulation, the Recession of 2008, and the enactment of the Dodd-Frank Act. This has been made possible through the use of a comprehensive literature review that combined theoretical and empirical arguments from a historical and economic perspective. In regards to the first research question, the literature review suggests that the extensive deregulation in the US Banking industry after 1980 significantly transformed the industry and intensified the interbank competition as banks engaged in an endless race to earn exorbitant profits. Along with deregulation, changes in demand and technology contributed to this large-scale transformation of the banking industry. Market shares accumulated to the largest banks as the sector significantly consolidated. The primary vehicles that banks exploited to generate profits were mortgages, derivatives, risk, and leverage. Perverse incentives evident in banking, regulatory and credit rating institutions allowed the exploitation of leverage to pursue exorbitant profits. This protracted period of careless lending resulted in the creation of a huge bubble. The bubble was the harbinger of great upheavals that materialized with the Recession of 2008 that put an end to this rampant growth of the banking industry and shook the foundations of the global economic system.

In the aftermath of the Recession, the Federal Government and the regulatory agencies placed their emphasis on addressing future systemic risk concerns by enacting the comprehensive financial overhaul "Dodd-Frank Act." In regards to the third research question, this gigantic piece of legislation imposed strict restrictions on the bank's activities. The main focus was given on strengthening capital reserves, performing frequent stress tests, and adopting a macroprudential approach. Additionally, the Dodd-Frank Act limited the non-interest income activities of banks. The effect of the legislation has raised many doubts among groups of professionals. Generally, it can be inferred that significant effort has been made through Dodd-Frank to create large banks that are very well capitalized and oversighted. In addition, it has managed to limit their exposure to counterparty risk and high-risk activities.

However, the Dodd-Frank Act has managed to achieve those objectives by loading those banks with huge burdens of compliance costs. The critics claim that those limits negatively influence the profitability and innovation of the sector. Also, those limitations ultimately result in increasingly consolidating the sector. As small and medium banks strive to survive in order to withstand the compliance costs, they need to engage in M&A transactions or retain the current scale of activities. This tendency allows the handful of players that control the industry to magnify even more in size and absorb market shares.

In regards to the objectives of reducing systemic risk and adopting macro-prudential approaches, the critics claim that some of the bodies that have been created through the Dodd-Frank Act are effective. However, the involvement of multiple bodies in the process and the overlap of their jurisdictions hints at future problems of confusion and inefficiency during times of recessions. Lastly, an opinion among critics supports the idea that the inherently political nature of these bodies can allow conflicts of interests, lobbying, and shady agreements to affect the performance of the legislation.

Moving to the empirical results and the fourth research question, this study employs an econometric model of Panel Regression to derive some actual results regarding the effects described in the literature. More specifically, a sample of 118 listed US Bank Holding Companies with more than 10 billion in Assets is examined. This research is based on the conventional studies that investigate the determinants of bank's profitability. The variables used include multiple Bank-specific, Industry-specific, and Macroeconomic variables. The profitability measures include ROA, ROE, and NIM. The applied econometric model pertains to a Fixed-effects with Entity and Time effects.

We find evidence that the most critical Determinants of large US bank's profitability include: Capital Strength, Credit Risk, Diversification, and Productivity. Moreover, Deregulation is positively and significantly related to profitability in all cases. Finally, weak evidence occurred for some Industry-specific and Macroeconomic variables. The results obtained through the use of our model are subject to some severe limitations and hence should be interpreted with caution.

The future extensions of this research could be directed towards expanding the US sample and including cross-sectional evidence from other markets to assess similarities and differences. Furthermore, additional variables that can increase explanatory power and cast light on causalities could be incorporated in similar models. Moreover, in terms of methodology, dynamic panel data models (GMM) could increase the degree of the result's efficiency. Lastly, as similar researches have been performed in other markets and other asset groups, the possibility of cross-comparisons for future researchers emerges.

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Appendix

The Graph Analysis at first attempts to provide support for and validation to the Literature Review by presenting visually relevant quantitative characteristics. Additionally, the Graph Analysis is utilized to lay the foundations for the Econometric model and link the results of the secondary data analysis with those of the primary data analysis. In particular, the Graph Analysis is divided into two parts, where the first one examines generic indicators of the US economy that can highlight the effect of the Recession of 2008 in the overall US economy. Second, the Structure of the US Banks is presented to showcase how Deregulation across time transformed the US Banking Sector. Third, the graphs associated with the Structure of Banks will provide a view on many of the variables that will be used in the Econometric Model and how those evolved in the period under consideration (1970-2019). Each graph section will be followed by brief comments, to sum up, and provide a critical examination of the results.

Data sources: FDIC, FRED, OFR, World Bank, Bankscope, Thomson Eikon

A. US Economic Indicators

Figure 1: US Real GDP Growth (1980-2019)

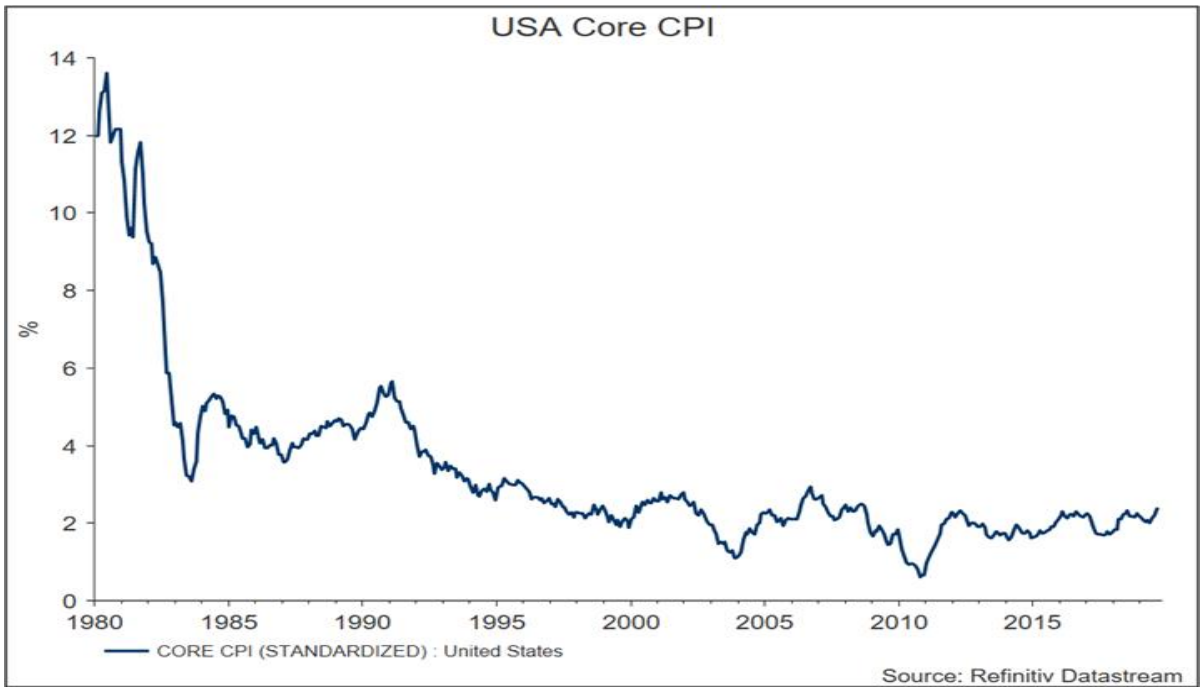


Figure 2: US Core Inflation (1980-2019)

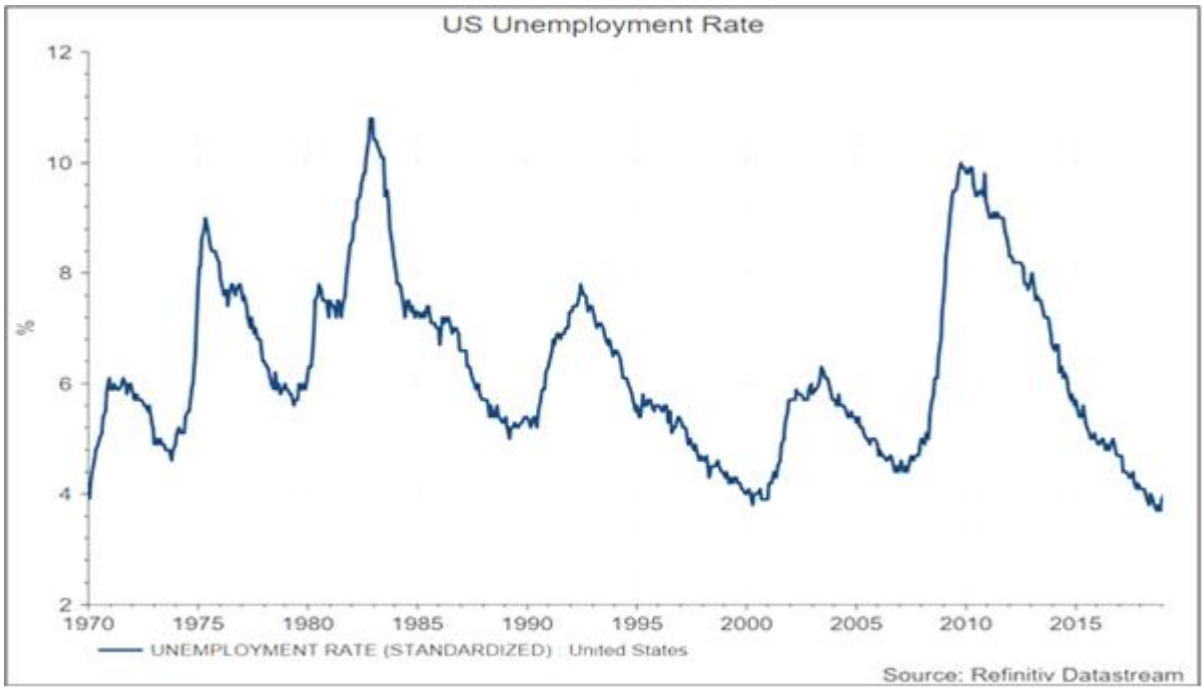


Figure 3: US Unemployment Rate (1970-2019)

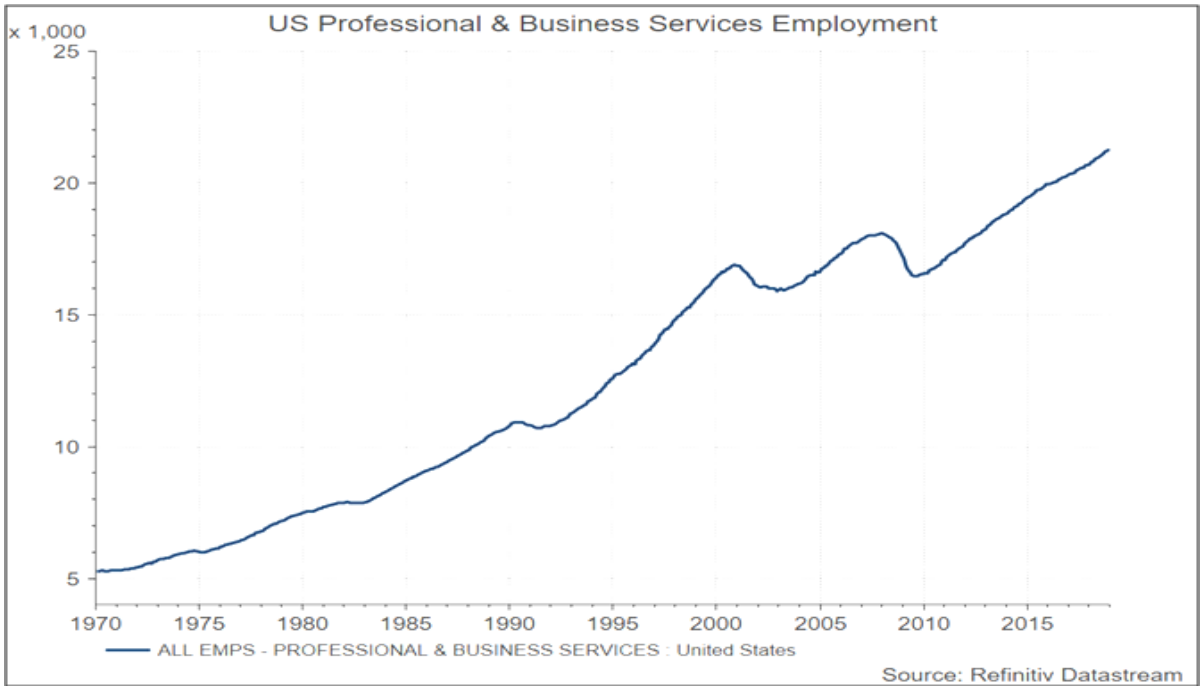


Figure 4: US Professional & Business Services Employment

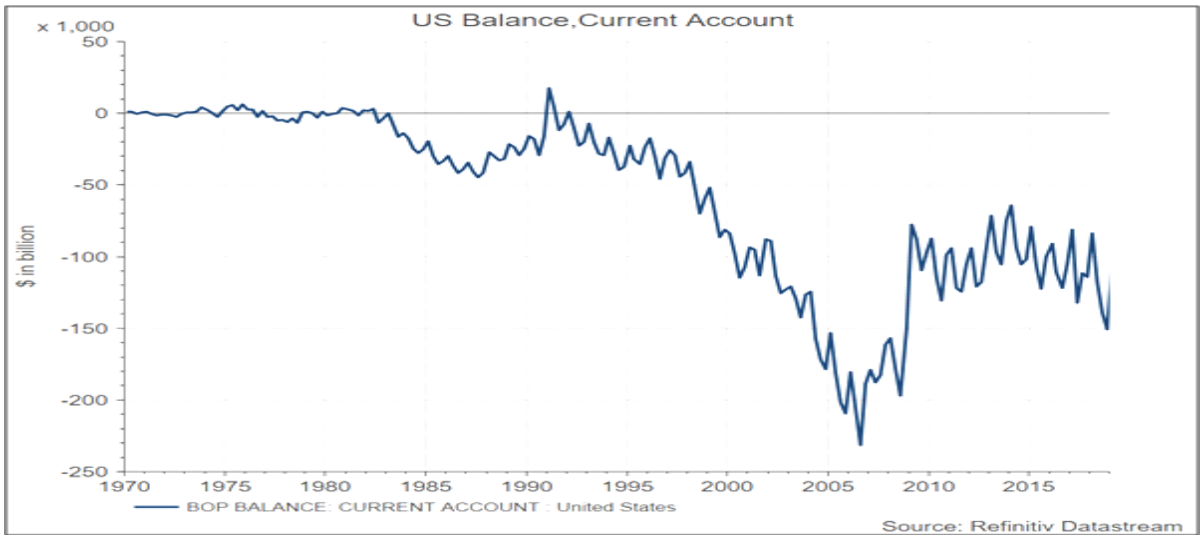


Figure 5:US Balance, Current Account (1970-2019)

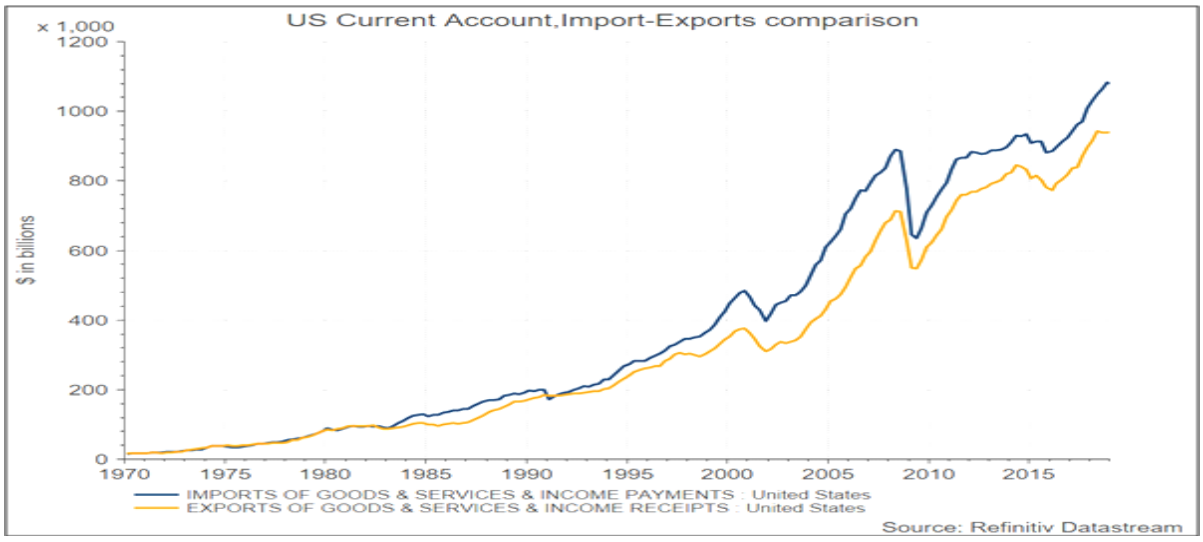


Figure 6: US Current Account, Imports-Exports (1970-2019)

Figure 7: US Balance, Goods & Services (1970-2019)

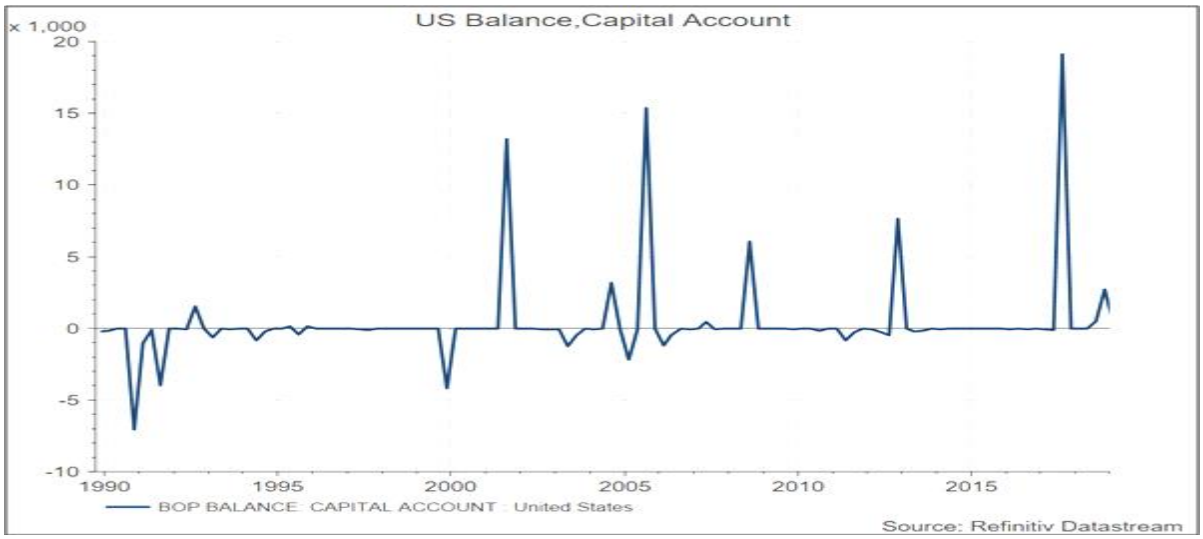


Figure 8: US Balance, Capital Account (1990-2019)

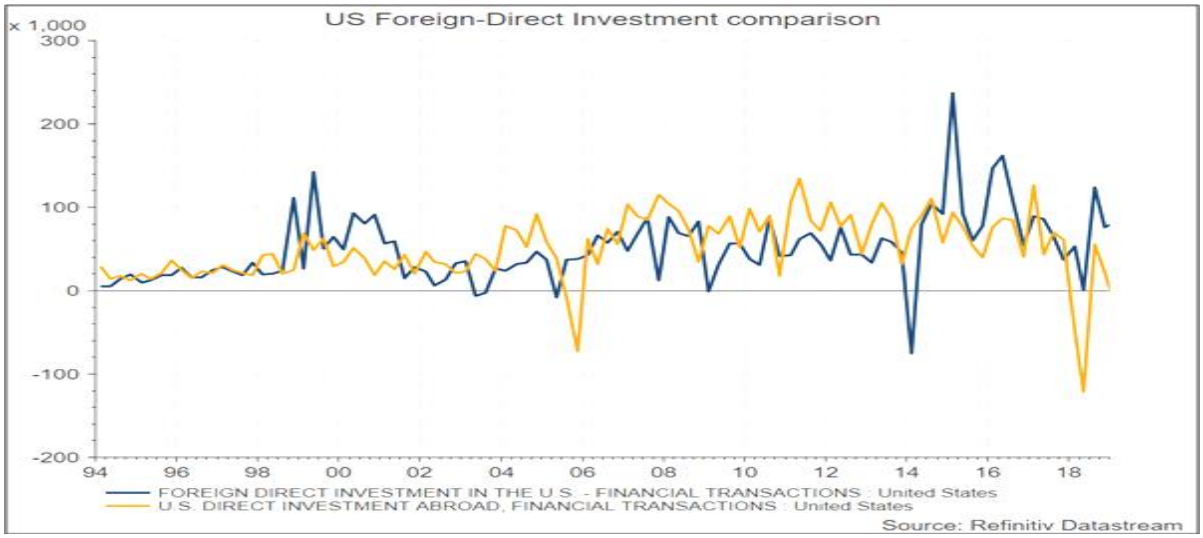


Figure 9: Foreign Investment in the US-US Direct Investment Abroad (1994-2019)

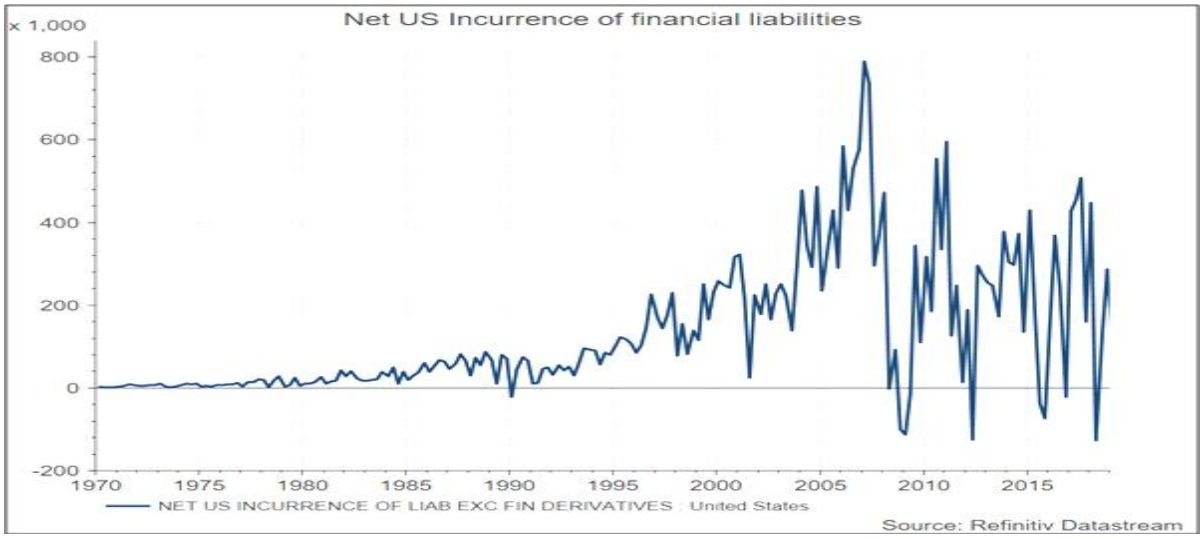


Figure 10: Net US Incurrence of Financial Liabilities (1970-2019)

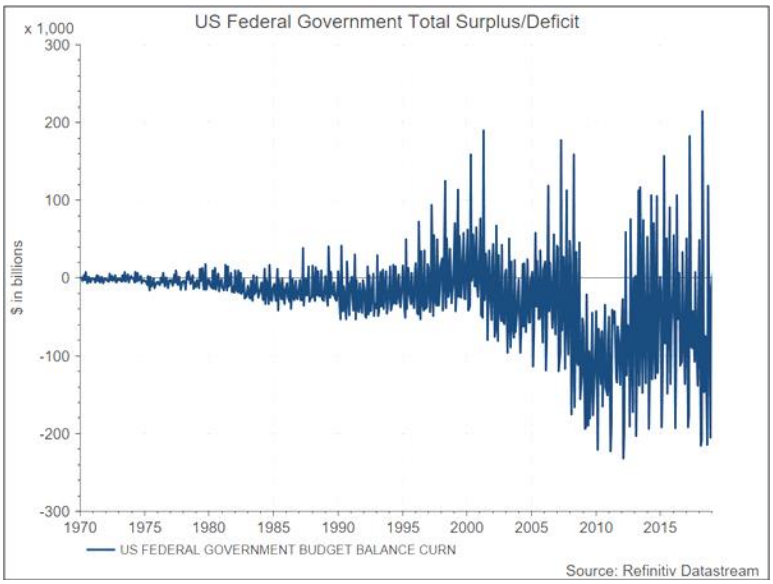


Figure 11: US Federal Government Surplus/Deficit (1970-2019)

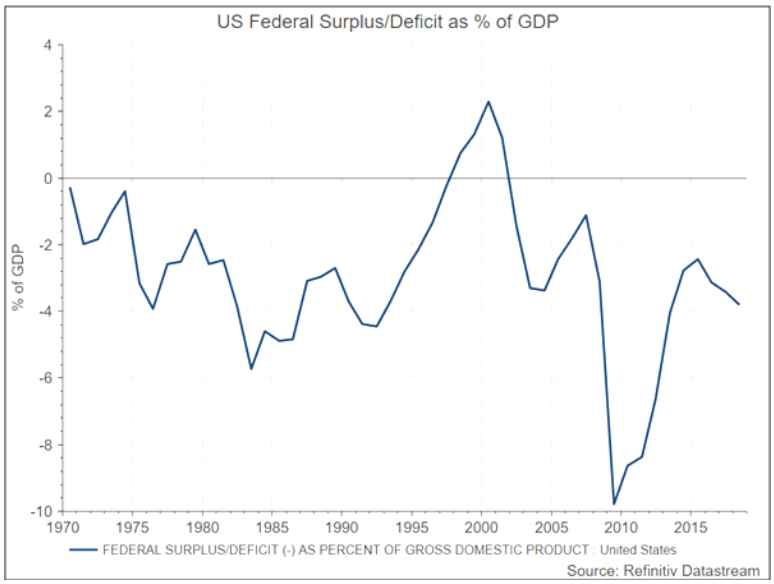


Figure 12: US Federal Surplus/Deficit as % of GDP (1970-2019)

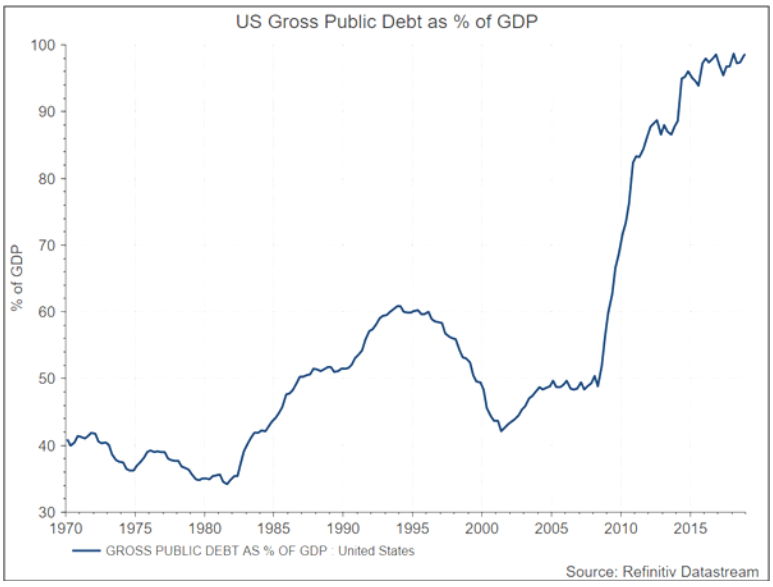


Figure 13: US Gross Public as % of GDP (1970-2019)

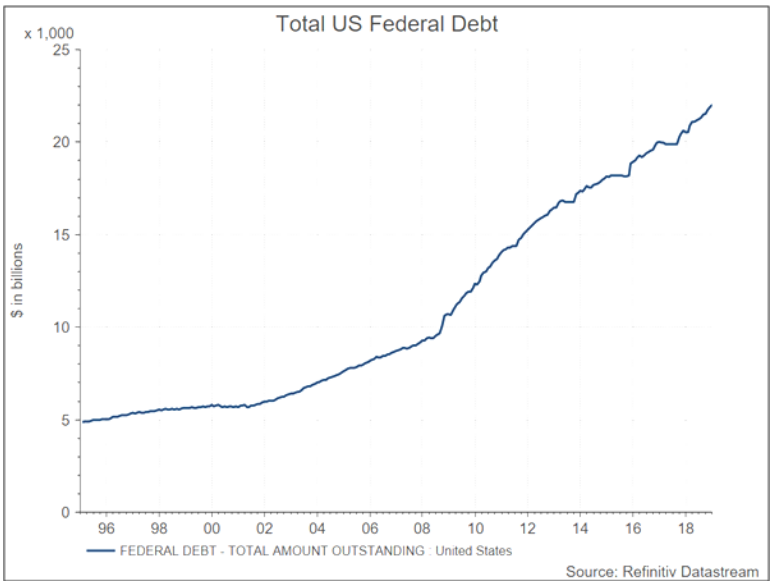


Figure 14: US Total Federal Debt (1993-2019)

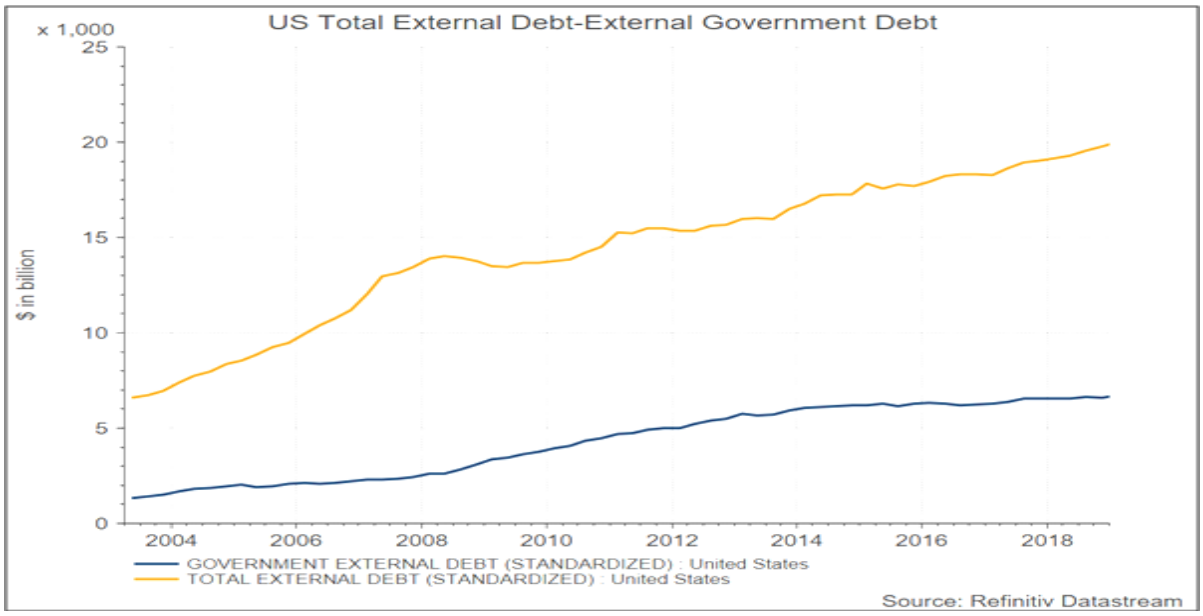


Figure 15: US Total External Debt Vs. External Government Debt (2001-2019)

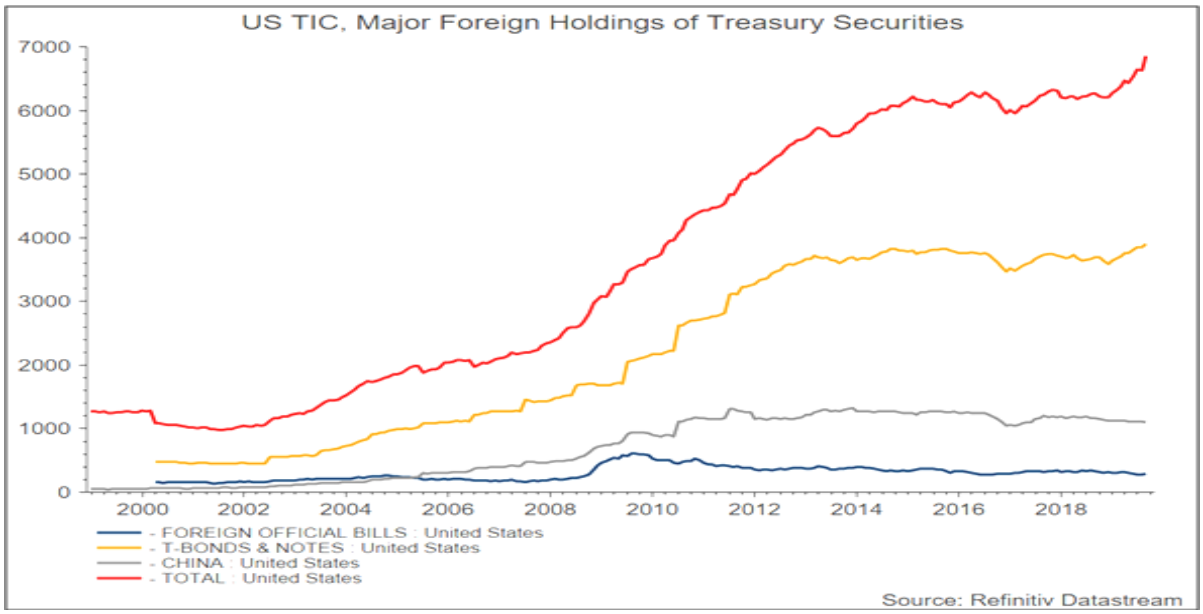


Figure 16: US TIC, Major Foreign Holdings of Treasury Securities (2000-2019)

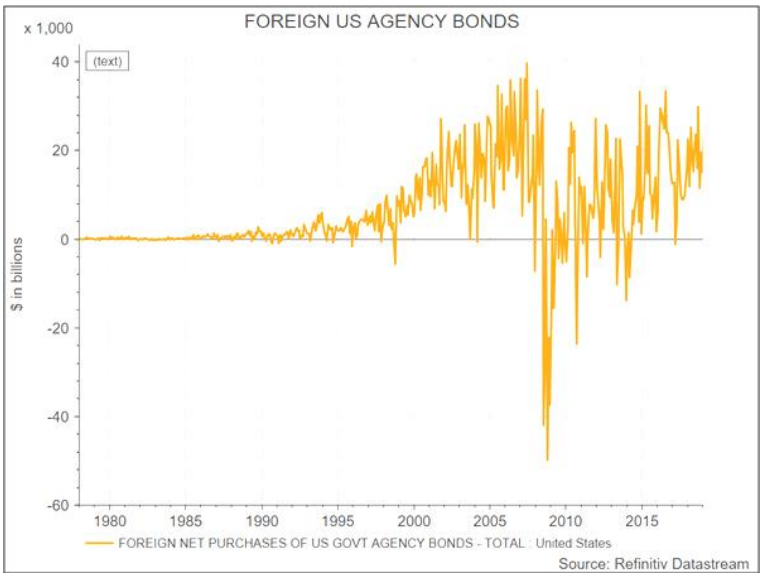


Figure 17: Foreign US Agency Bonds (1980-2019)

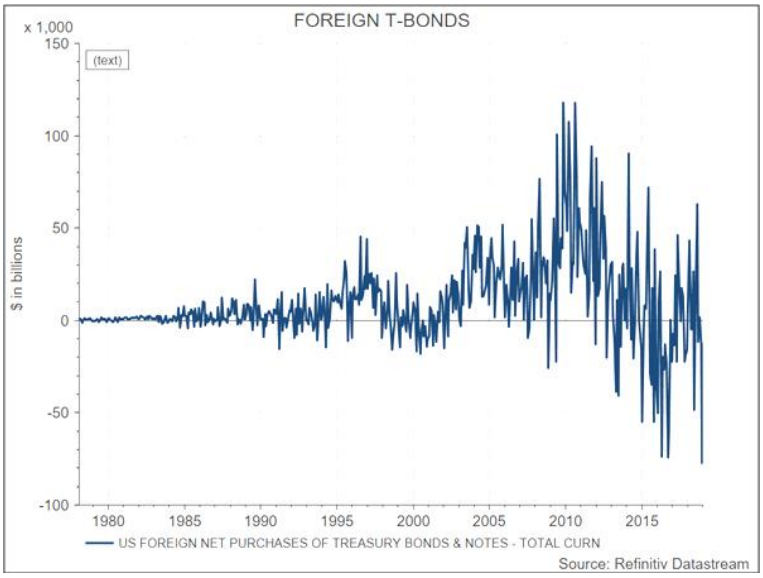


Figure 18: Foreign US T-Bonds & Notes (1980-2019)

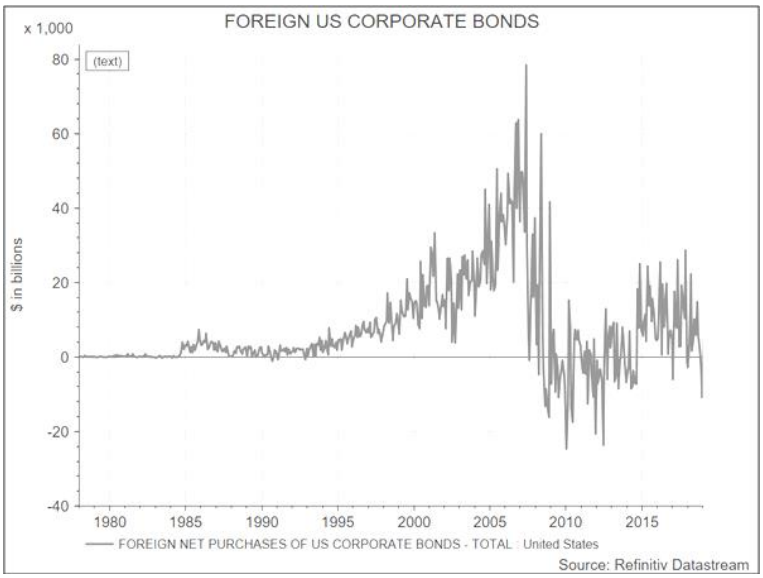


Figure 19: Foreign US Corporate Bonds (1980-2019)

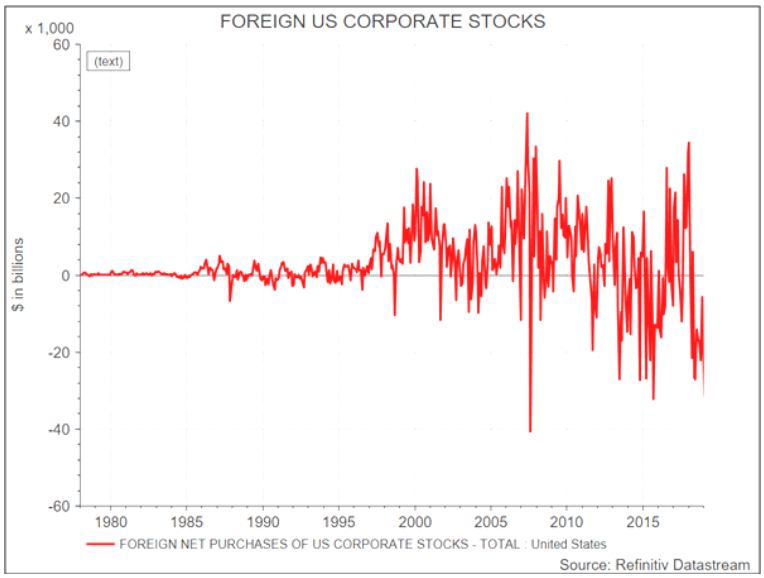


Figure 20: Foreign US Corporate Stocks (1980-2019)

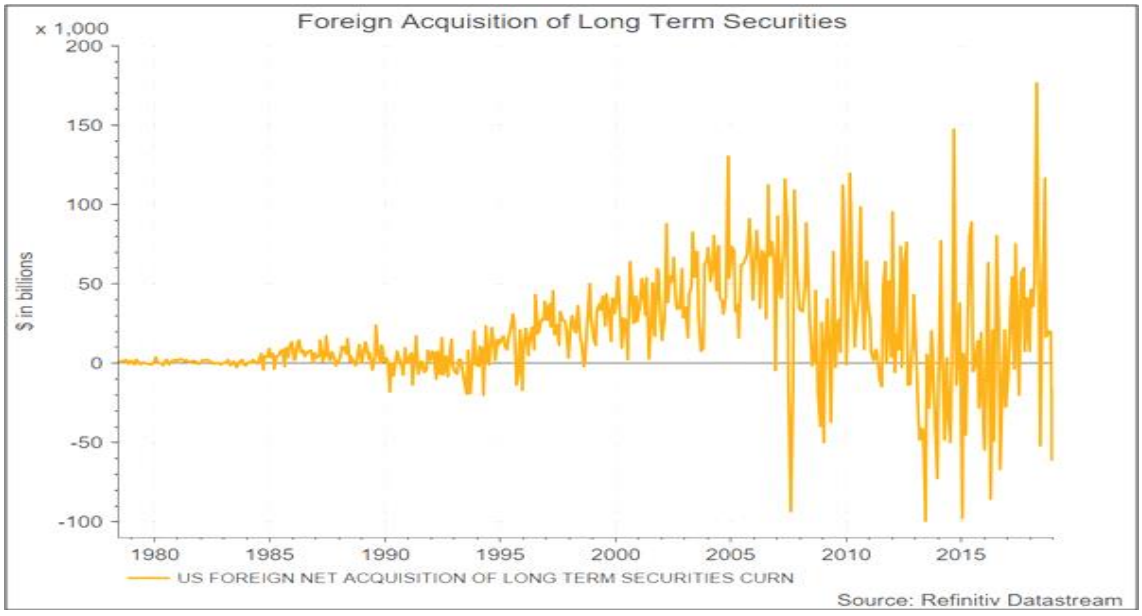


Figure 21: Foreign Acquisition of US Long Term Securities (1980-2019)

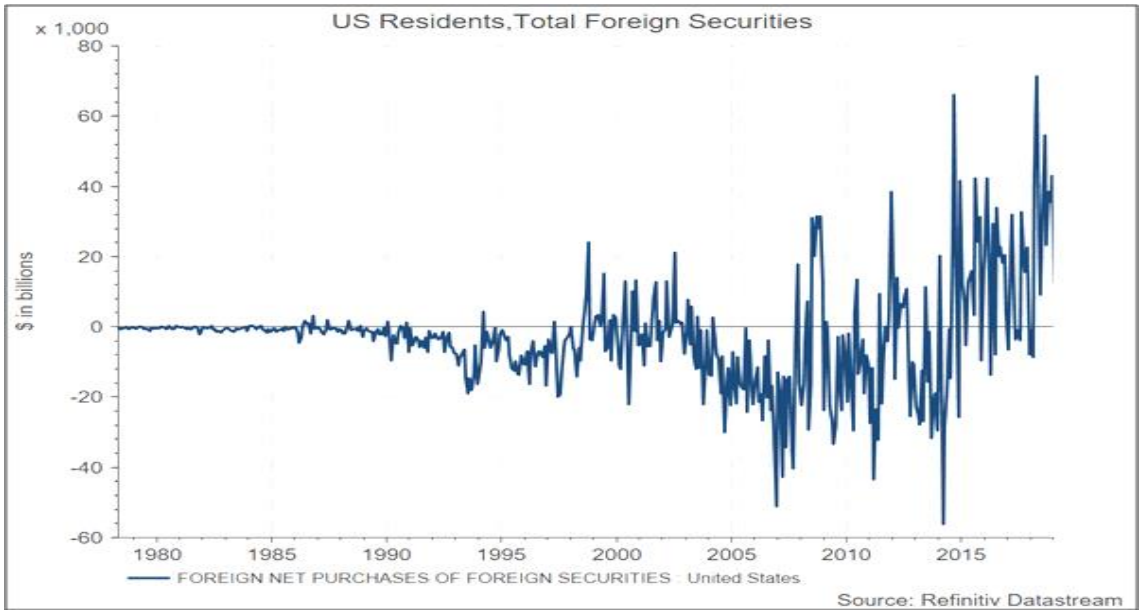


Figure 22: US Residents, Total purchases of Foreign Securities (1980-2019)

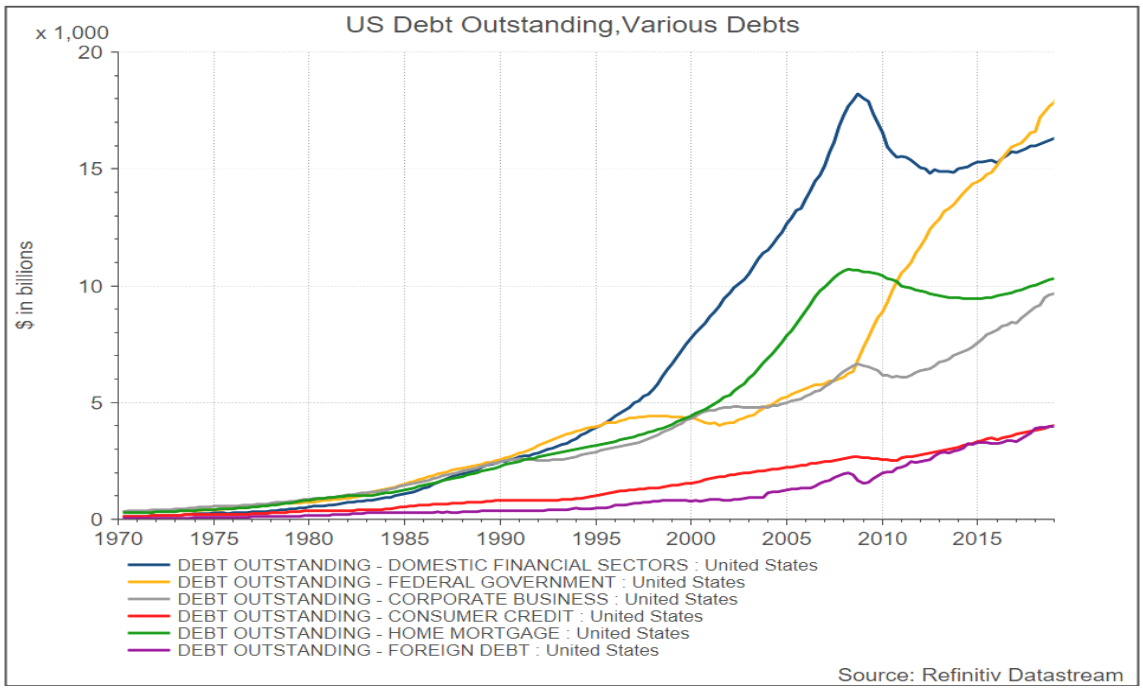


Figure 23: US Debt, Various Debt Levels (1970-2019)

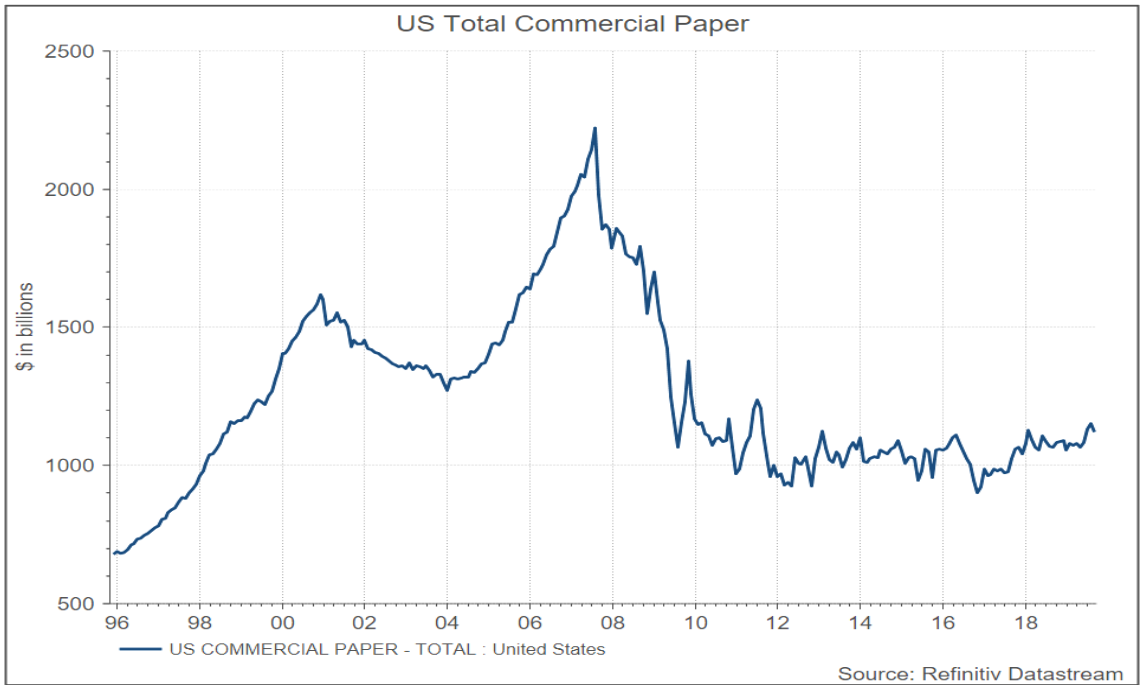


Figure 24: US Total Commercial Paper (1996-2019)

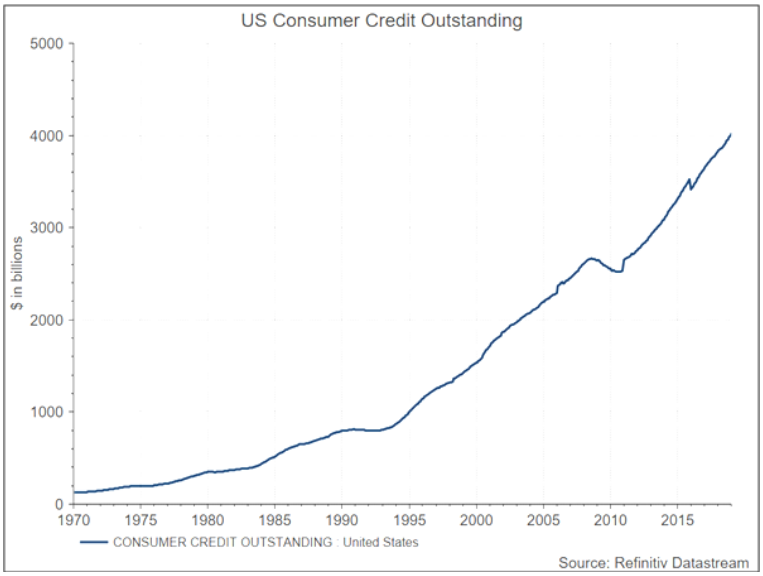


Figure 25: US Consumer Credit Outstanding (1970-2019)

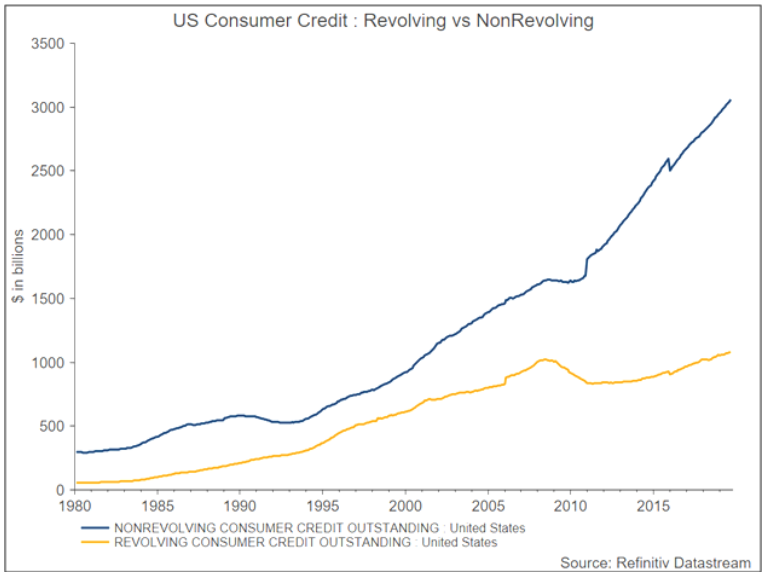


Figure 26: US Consumer Credit: Revolving vs Non Revolving (1980-2019)

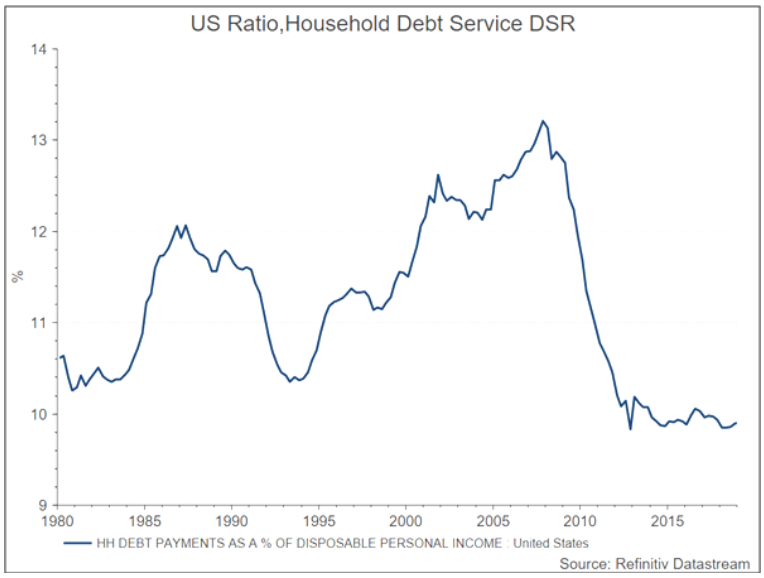


Figure 27: US Household Debt Service Ratio (1980-2019)

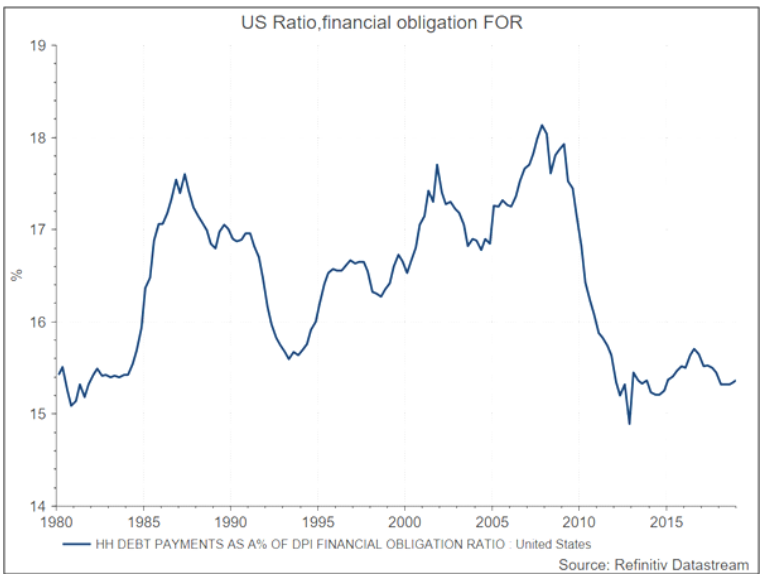


Figure 28: US Financial Obligations Ratio (1980-2019)

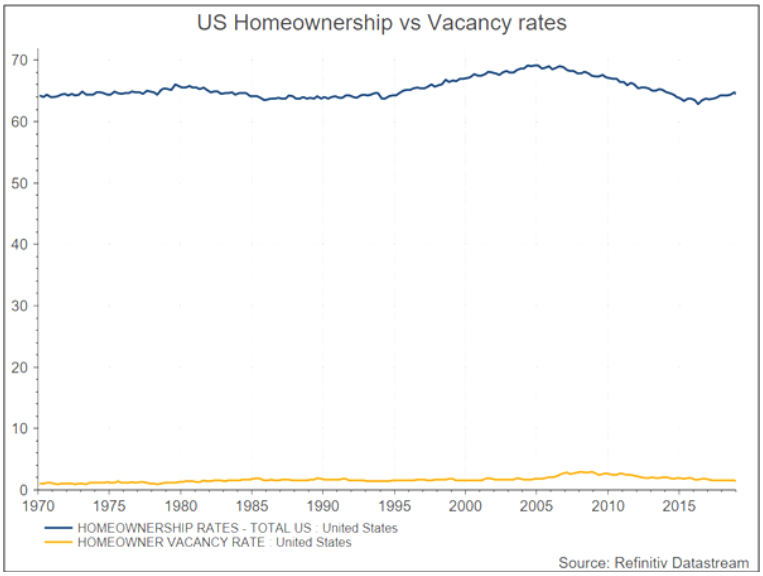


Figure 29: US Homeownership Vs Vacancy (1970-2019)

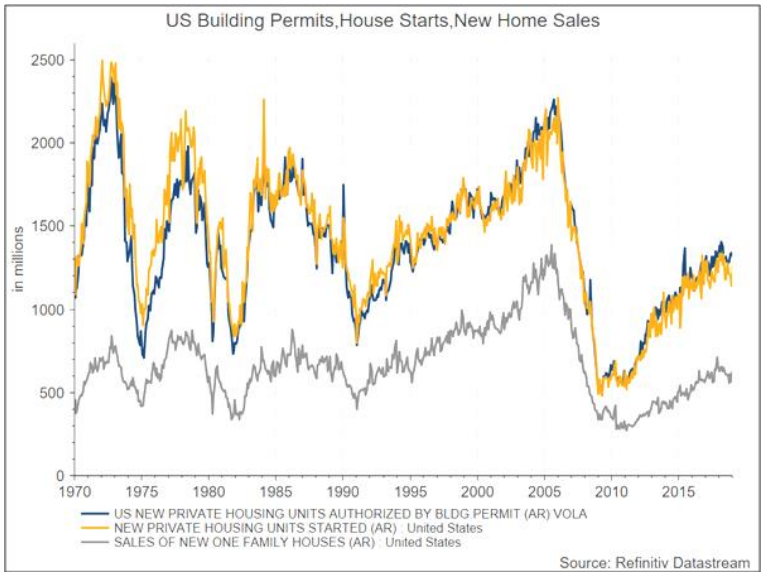


Figure 30: US Building Permits, House Starts, New Home Sales (1970-2019)

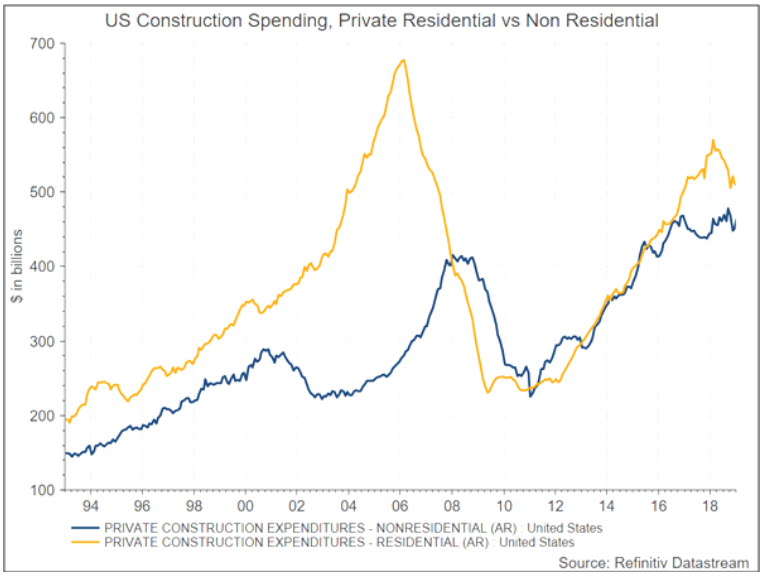


Figure 31: US Construction Spending,

Private Residential vs Non Residential (1990-2019)

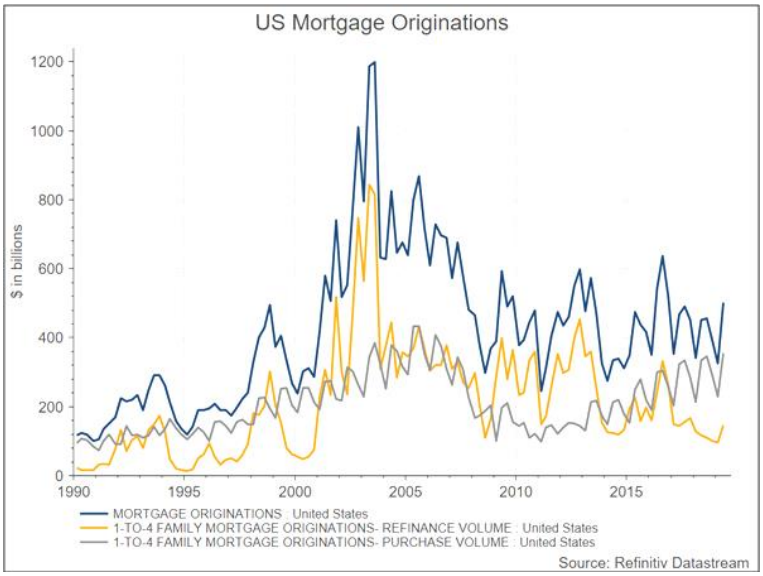


Figure 32: US Mortgage Originations, Refinance, Purchase (1990-2019)

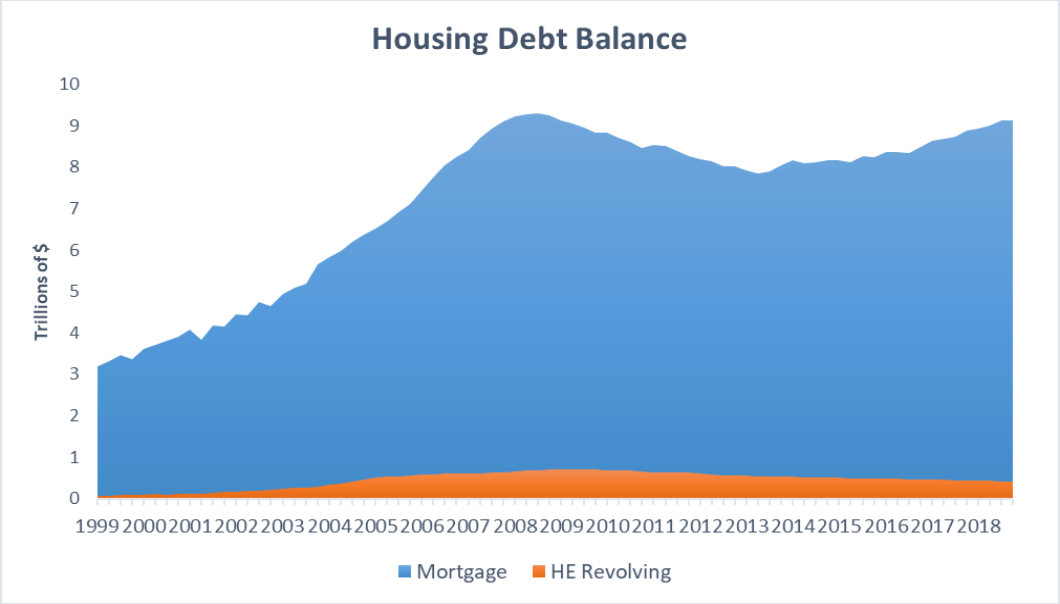


Figure 33: US Housing Debt Balance, Mortgage & Home Equity (1999-2019)

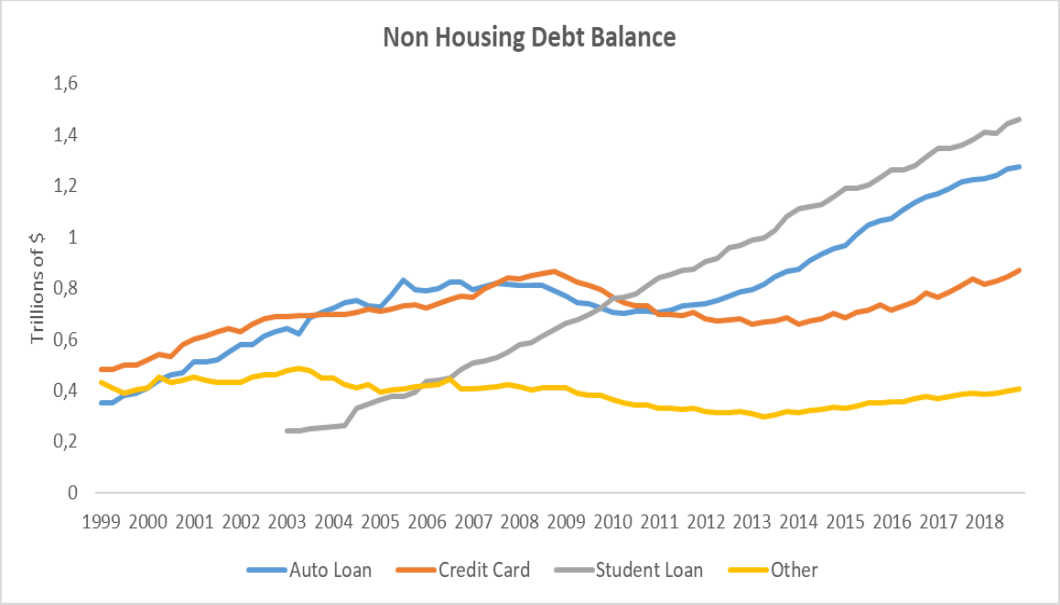


Figure 34: US Non Housing Debt Balance, Auto, Credit , Student , Other (1999-2019)

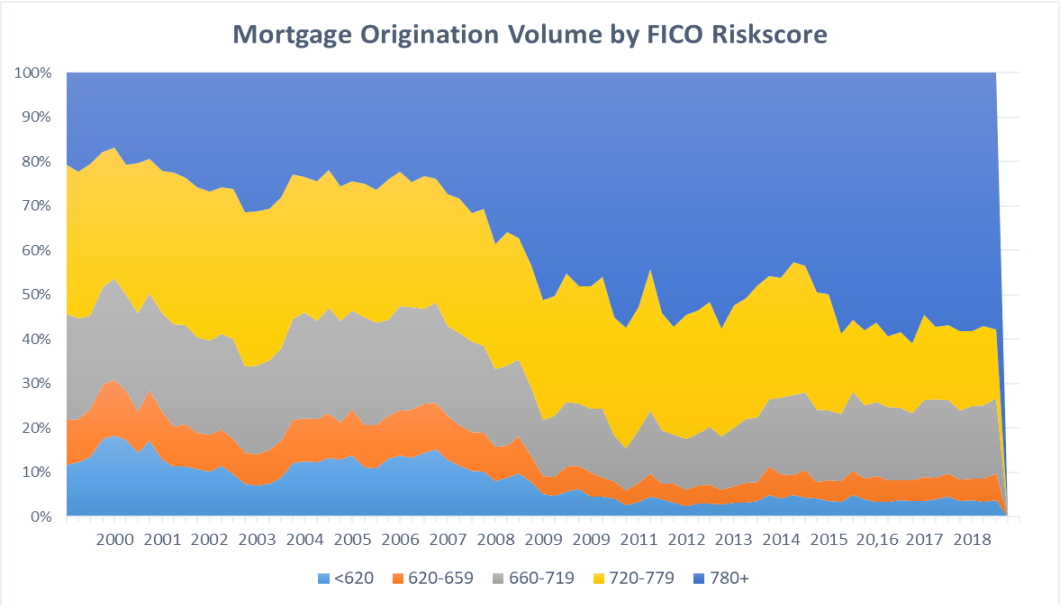


Figure 35: US Mortgage Origination Volume by Fico Risk Score (1996-2019)

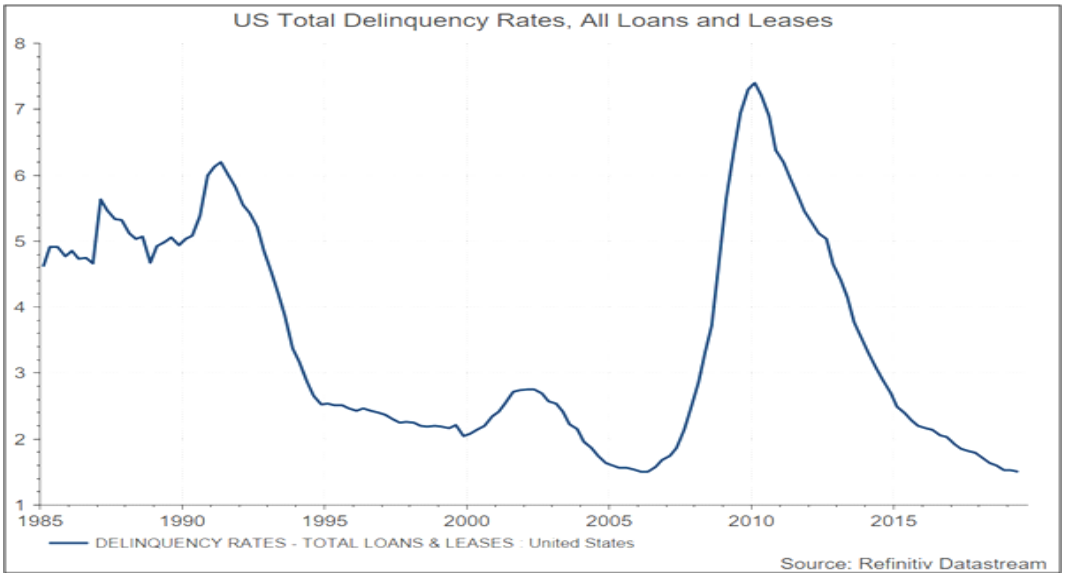


Figure 36: US Total Delinquency Rates (1985-2019)

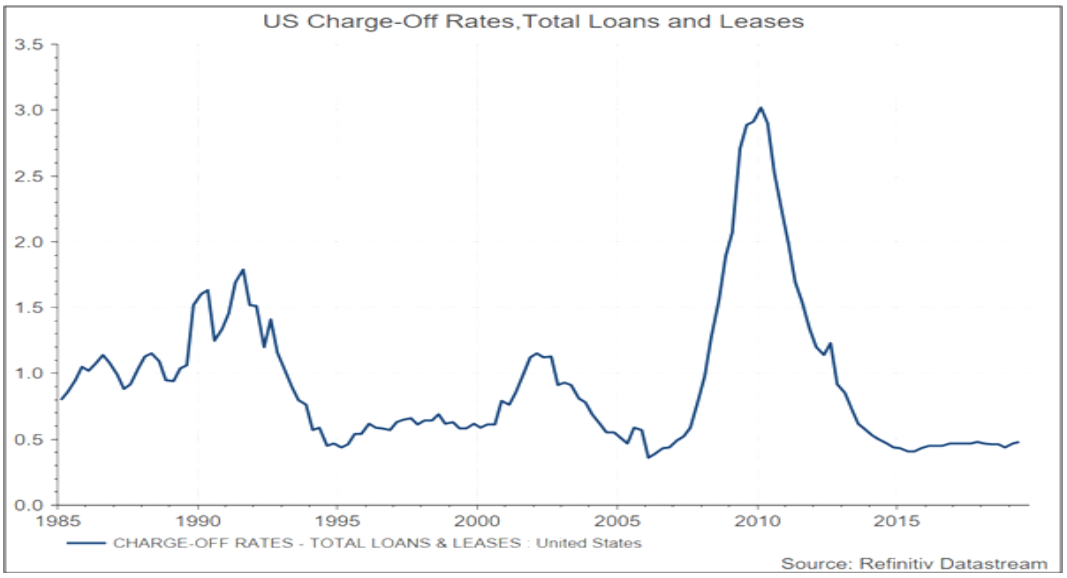


Figure 37: US Charge-offs Rates (1985-2019)

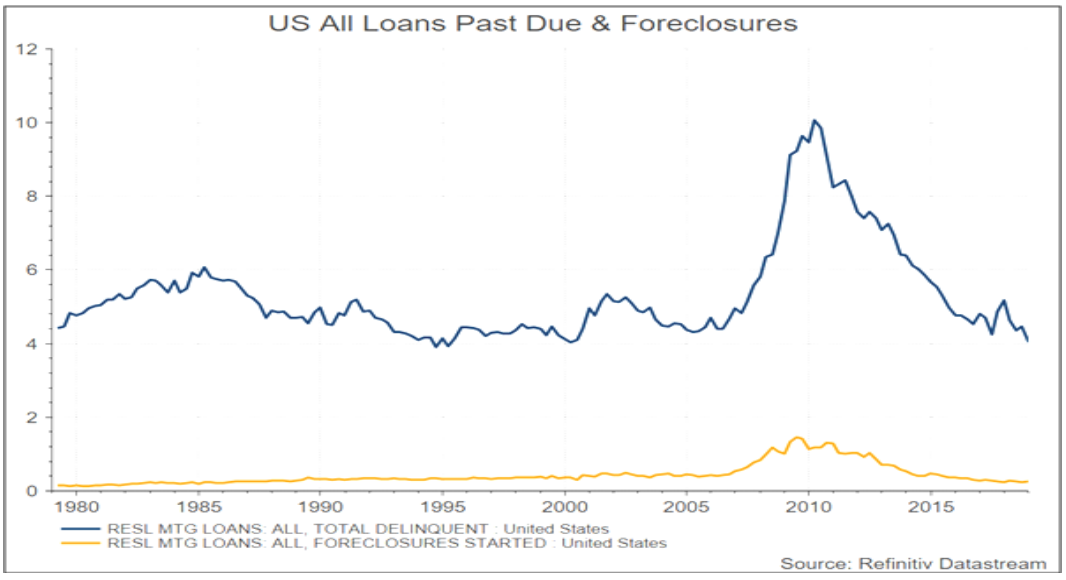


Figure 38: US All Loans Past Due & Foreclosures (1980-2019)

Brief Comments on US indicators

This first part of the Graph Analysis presents generic indicators of the US economy; through its examination, several observations stand out. First, during the period mentioned above, the US has been hit by multiple recessions (1970,1973-1975, 1980, 1981-1982, 1990, 2000 and 2008). This short timespan between recessions has resulted in a volatile environment of declines and recoveries of Real GDP growth and unemployment. Regarding inflation, its high level during 1970-1980 can be attributed to oil crises, government overspending, and rising prices and wages. However, after 1980, a generic contraction of inflation can be observed that stems from the changes in US monetary policy aiming to avert deflation situations.

Moreover, by looking at the Current Account graphs, we can observe the actual change of the economic model that occurred after 1980 in the US. In particular, the introduction and establishment of Neoliberal Economics by Margaret Thatcher and Ronald Reagan replaced the Keynesian model of wages and productivity. Essentially, the manufacturing base of the US was decomposed and gave its place to an economic model of knowledge work. Services, housing, and leverage constituted the driving forces of this model. Initially, this is reflected in Current Account Graphs as we can observe that approximately from 1980 the imports of USA are higher than their exports. As far as the US direct investment abroad and the foreign direct investment in the US are concerned, we can notice that in the period under consideration, they generally appear in par. This can be partly explained on the one hand by the attractiveness of US Financial Markets and on the other hand, by the outsourcing of US business activities towards emerging markets of lower production and wage costs such as China and India.

In regards to the Federal Government deficit, we can observe that it is declining from 1970 and onwards. This can be partly attributed to the use of deficit spending as a medium of expansionary fiscal policy to drive economic growth. The deficit is mostly based on military spending, tax cuts, and mandatory spending, such as Social Security and Medicare. Additionally, countries such as China and Japan have been traditionally

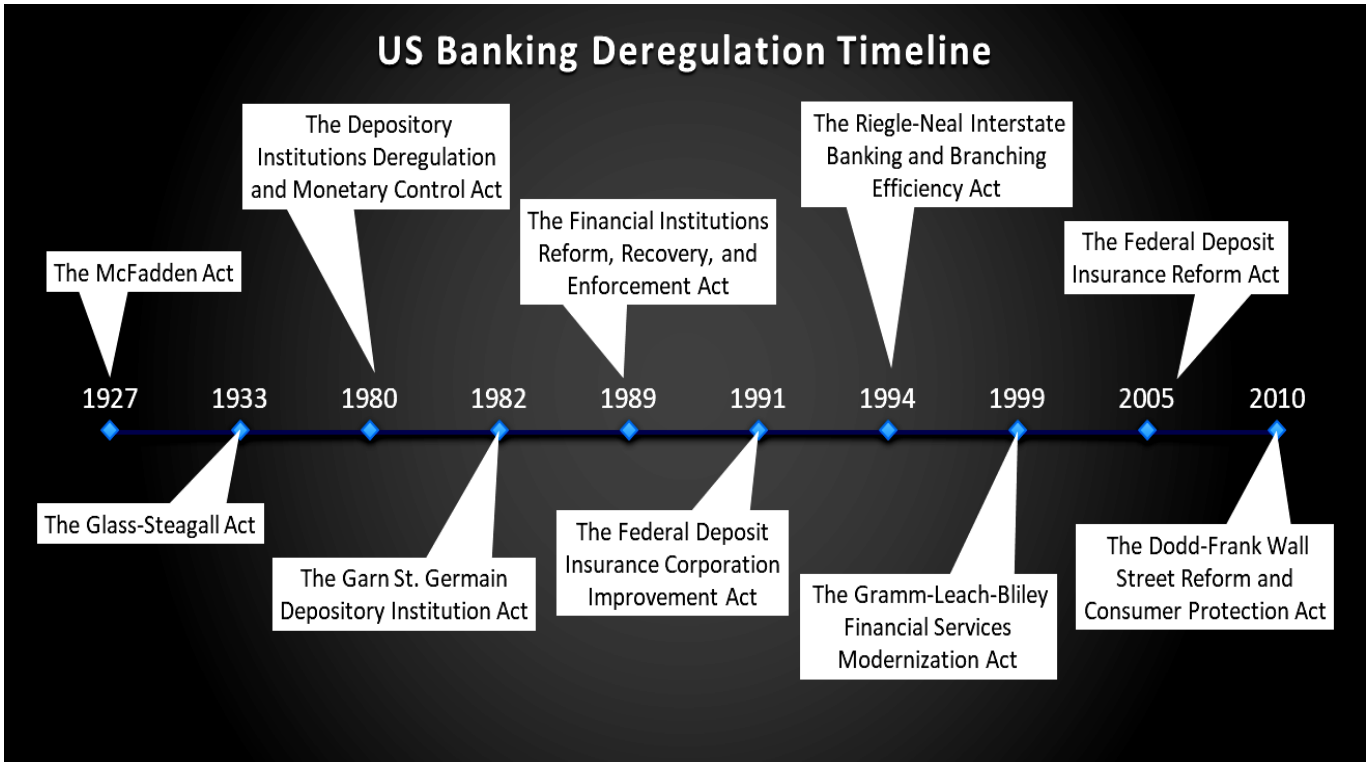
major holders of Treasury Securities in order to devaluate their currencies relative to the dollar to fuel US-based absorption of their exports. The US has managed to hold deficits due to protracted low-interest-rate policies after 1980. Foreign positions on Treasury securities have been maintained because of a belief in the economic power of the US and its status as a haven for investment. The deficit doubled during the Recession of 2008 due to Quantitative Easing policies to fight Recession and spur growth. In hindsight, deficit spending created short-term economic growth through empowering defense, healthcare, and construction. However, the excessive deficit in case of declining demand for Treasuries and devaluation of the dollar can result in increased systemic risk and interest payments.

Furthermore, we can observe the evolution of various types of debts in the US. The effects of the Recession of 2008 are evident in many indicators. Initially, mortgage originations, construction spending, delinquency rates, charge-off rates, and loans past due increase significantly until 2010, and then a slowdown is experienced. The same situation can be noticed in the level of Commercial Paper, which was the medium of funding the liquidity mismatch of MBS. The RICO scores of Mortgage originations after 2010 have substantially moved towards the higher score (780+), reflecting the new stringent criteria for mortgages. The housing bubble and its bust are clear despite a recurring resurgence. The main observation that stands out is the fact that other forms of debt namely consumer (auto, credit, student loans) and corporate, have significantly risen. The systemic risk has transitioned from housing to the federal government, and in parallel, consumer debt is still surging through other forms along with corporate debt. The combination of these dynamics can make up for a gloomy economic outlook.

B. Structure of US Banks

Data sources: FDIC, FRED, OFR, World-Bank, Bankscope

Figure 39: US Timeline of Major Deregulation reforms in US Banking



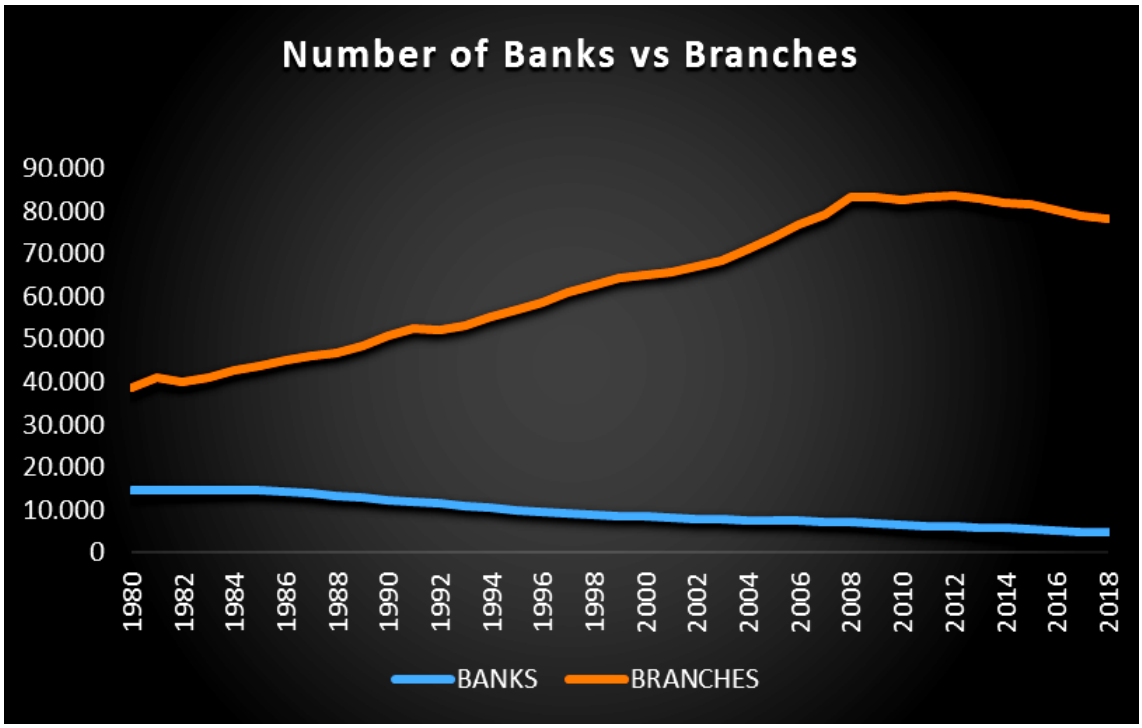


Figure 40: USA, Number of Banks vs. Branches (1980-2019)

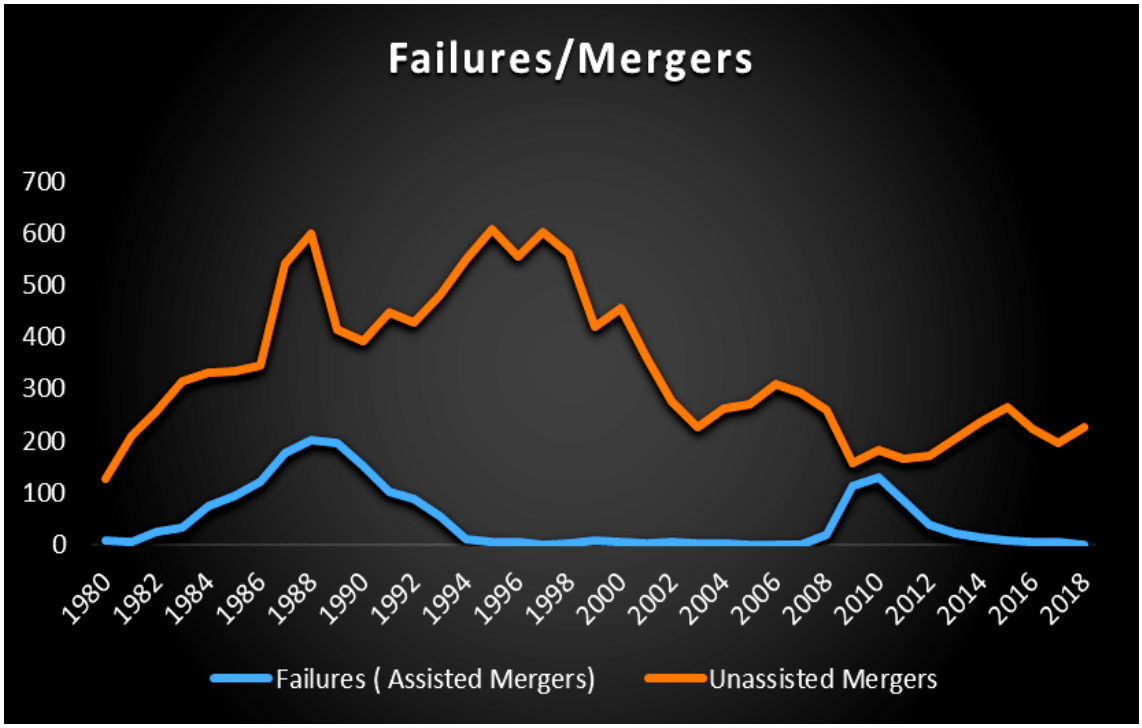


Figure 41: USA, Bank Failures Vs. Mergers (1980-2019)

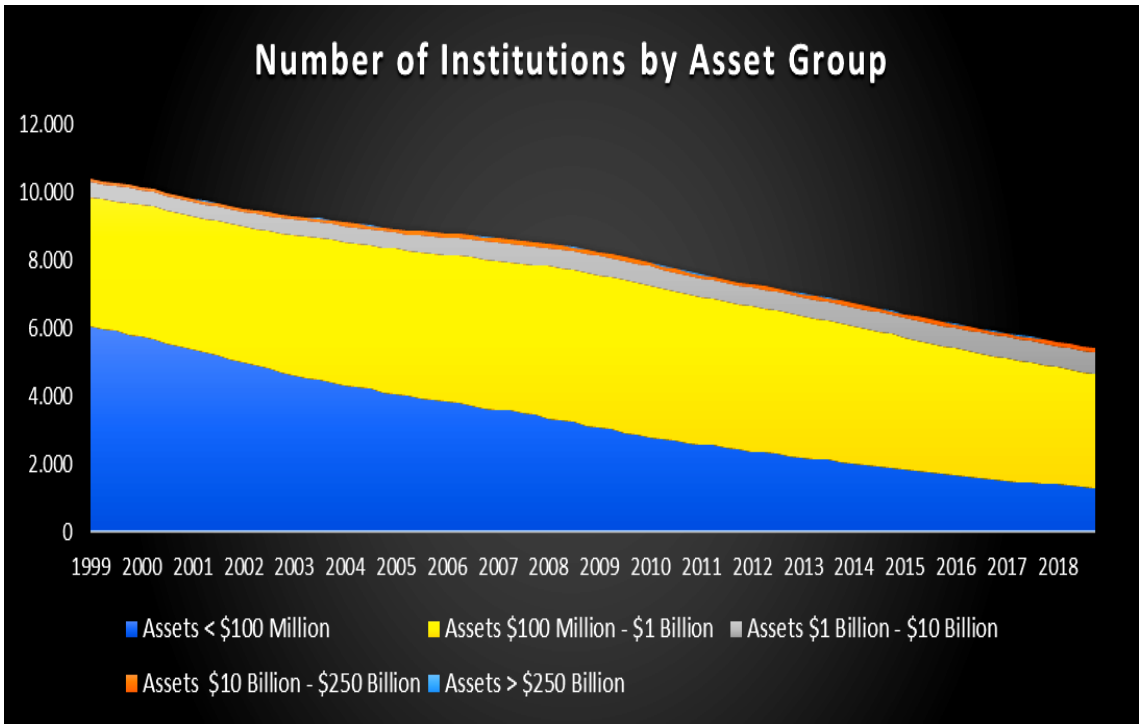


Figure 42: Number of US Banking Institutions by Asset Group (1999-2019)

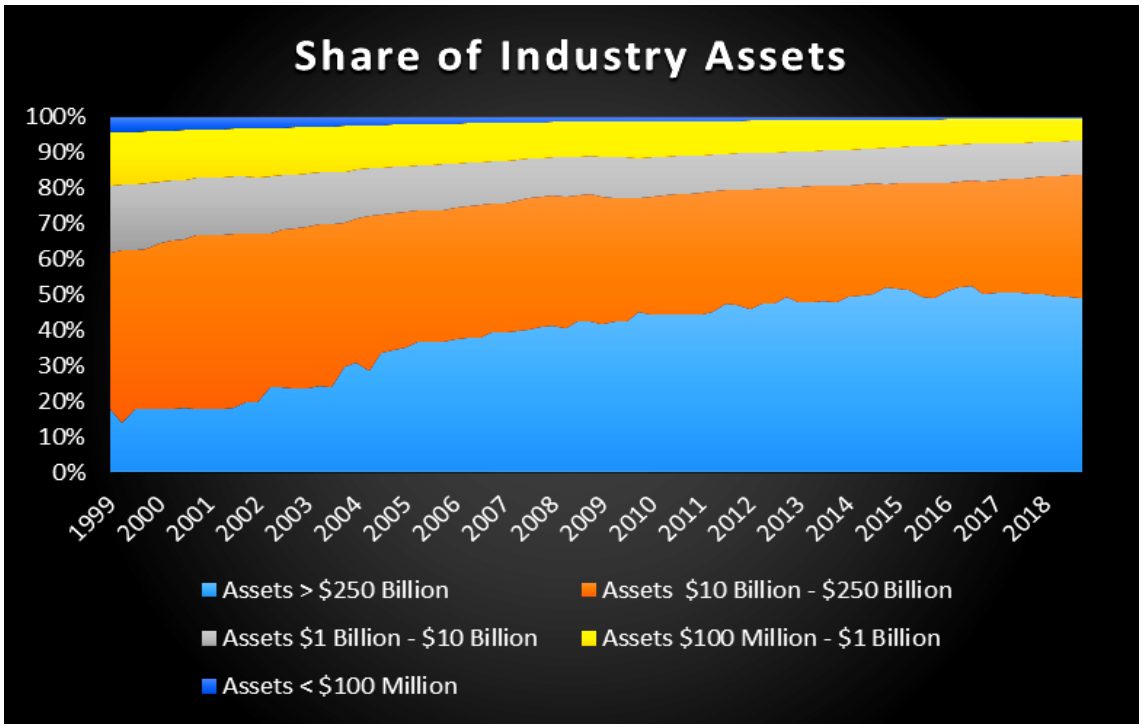


Figure 43: Asset Share of US Banking Industry (1999-2019)

Ratios

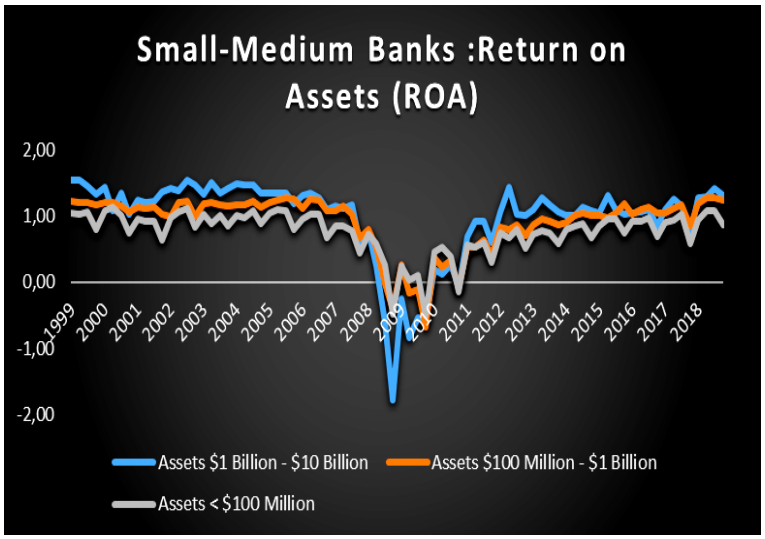


Figure 44: US Small-Medium Banks, ROA (1999-2019)

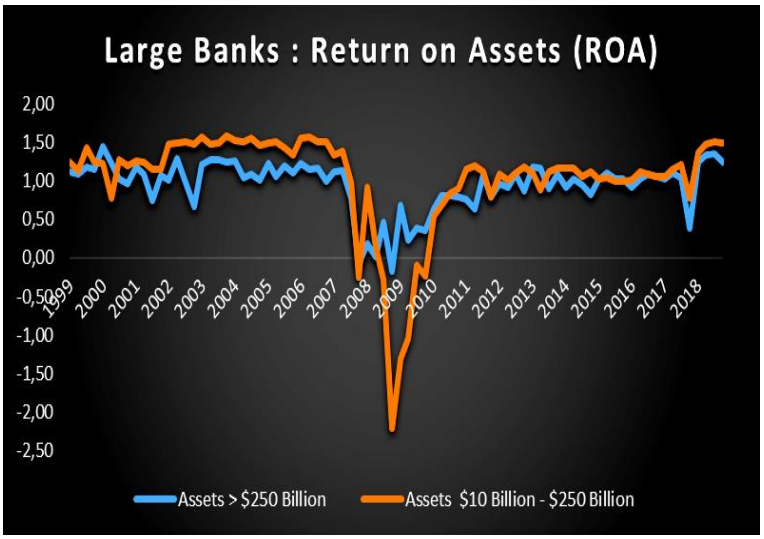


Figure 45: US Large-Banks, ROA (1999-2019)

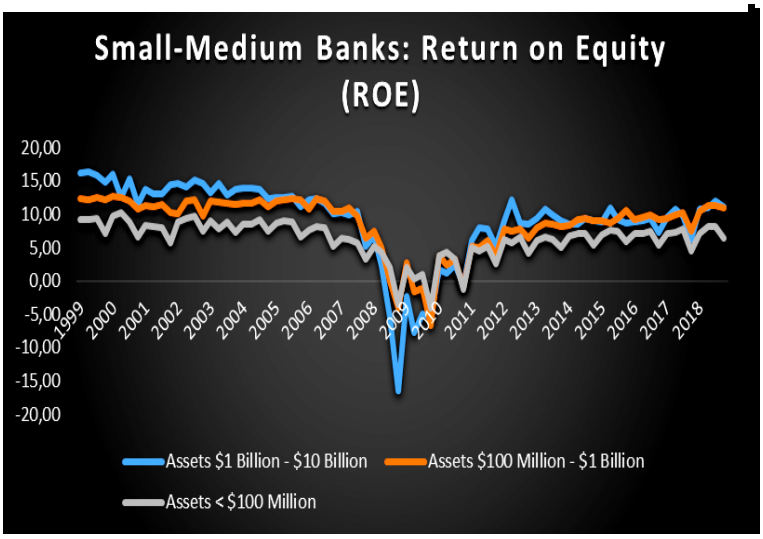


Figure 46: US Small-Medium Banks, ROE (1999-2019)

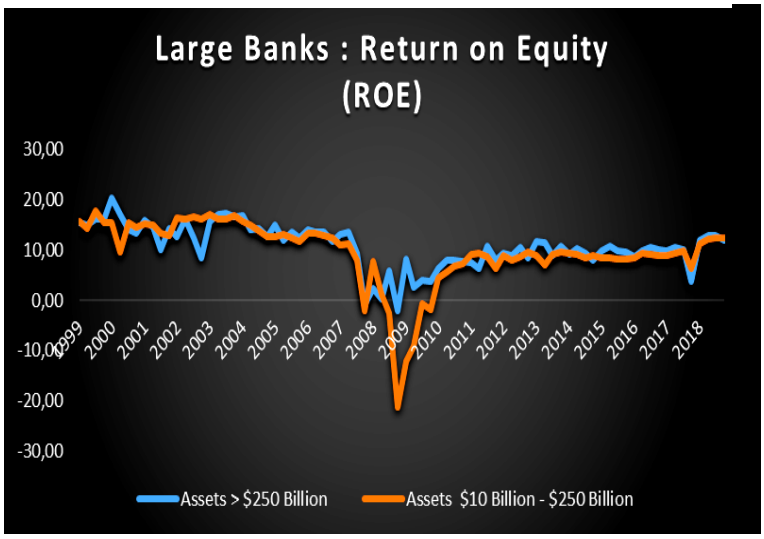


Figure 47: US Large Banks, ROE (1999-2019)

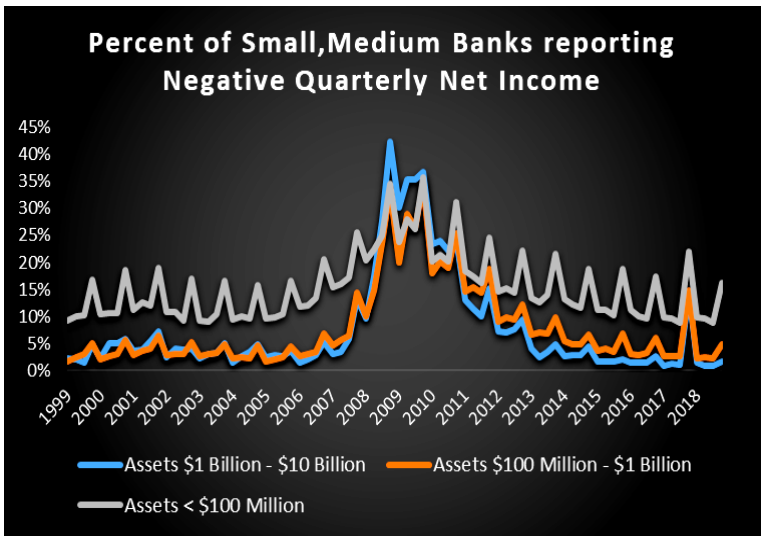


Figure 48: US Small-Medium Banks with Losses (1999-2019)

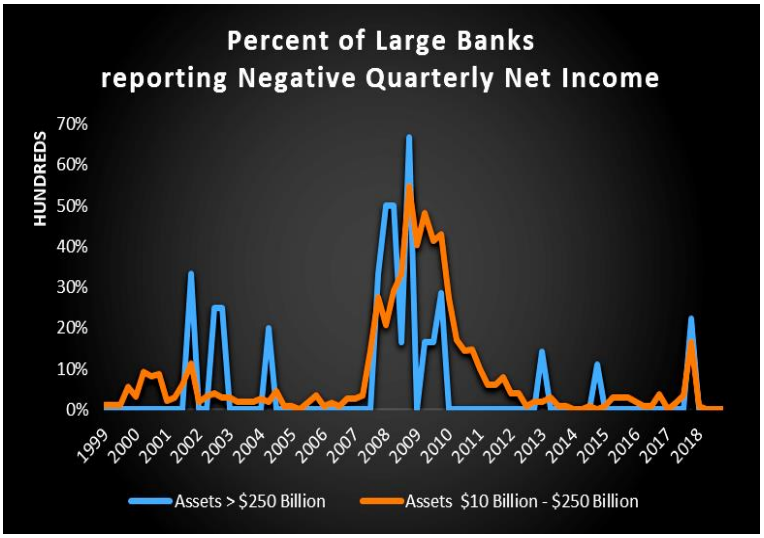


Figure 49: US Large Banks with Losses (1999-2019)

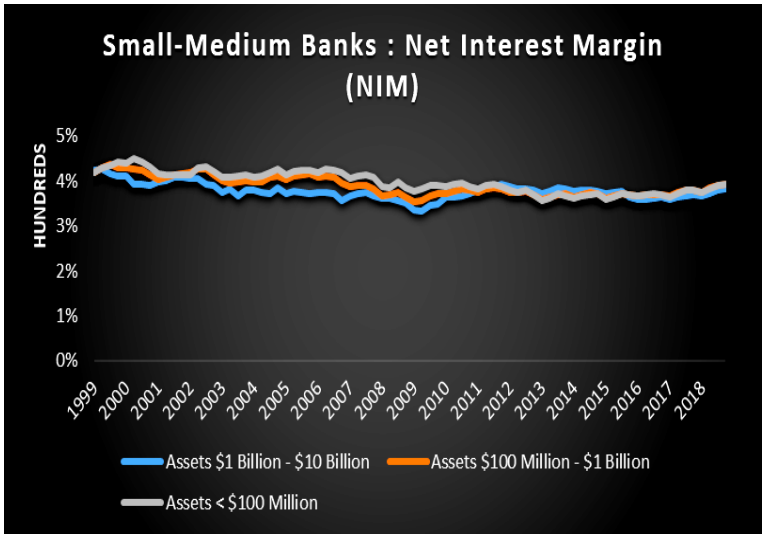


Figure 50: US Small-Medium Banks, Net Interest Margin (1999-2019)

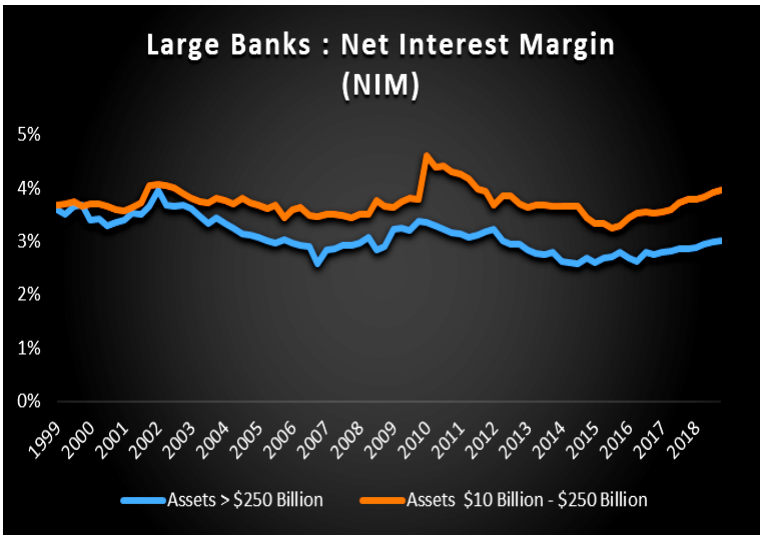


Figure 51: US Large Banks, Net Interest Margin (1999-2019)

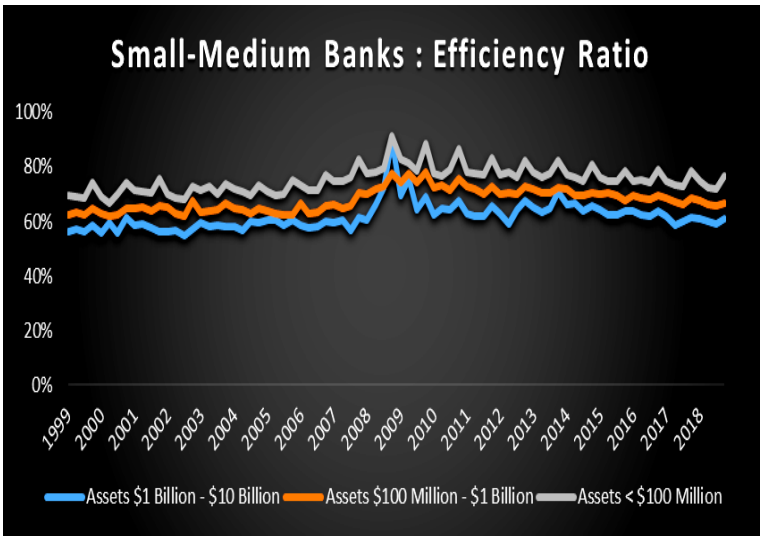


Figure 52:US Small-Medium Banks, Efficiency Ratio (1999-2019)

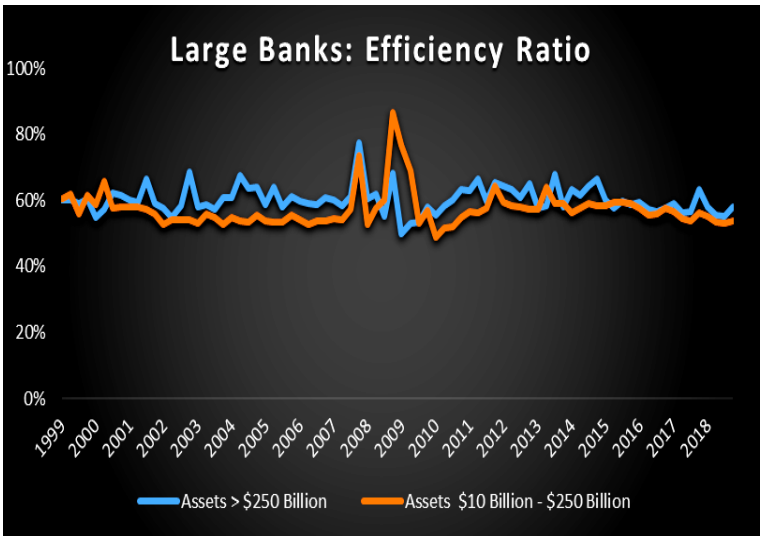


Figure 53: US Large Banks, Efficiency Ratio (1999-2019)

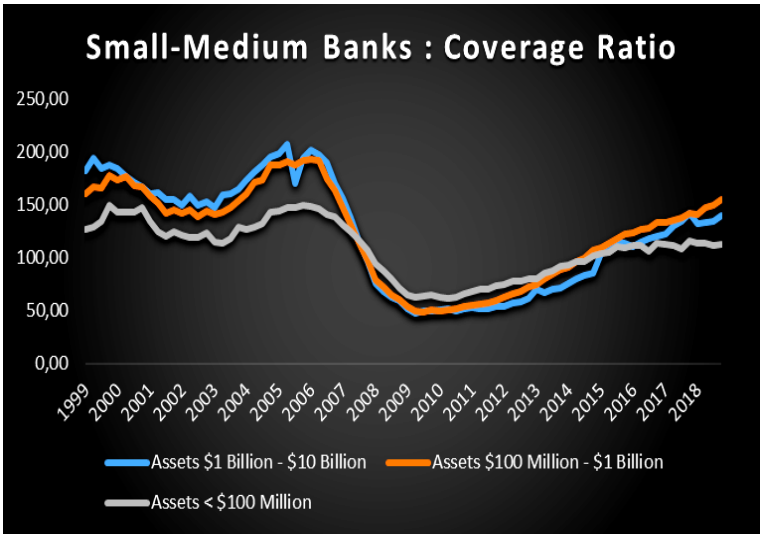


Figure 54: US Small-Medium Banks, Coverage Ratio (1999-2019)

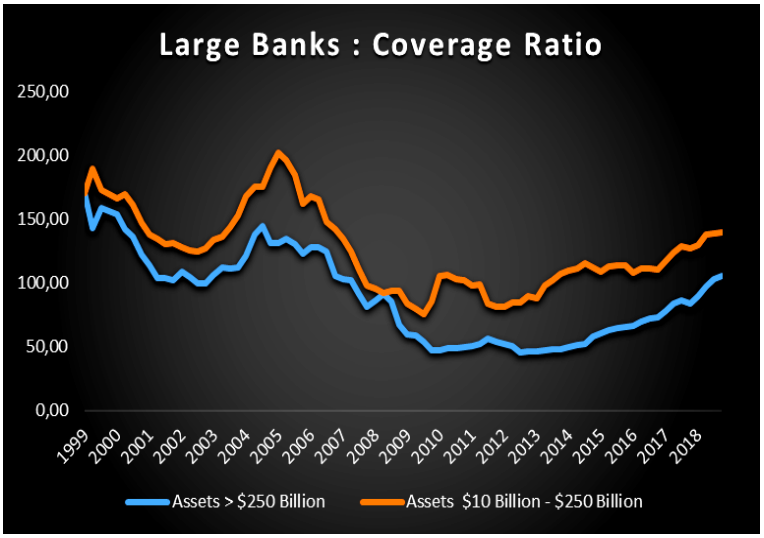


Figure 55: US Large Banks, Coverage Ratio (1999-2019)

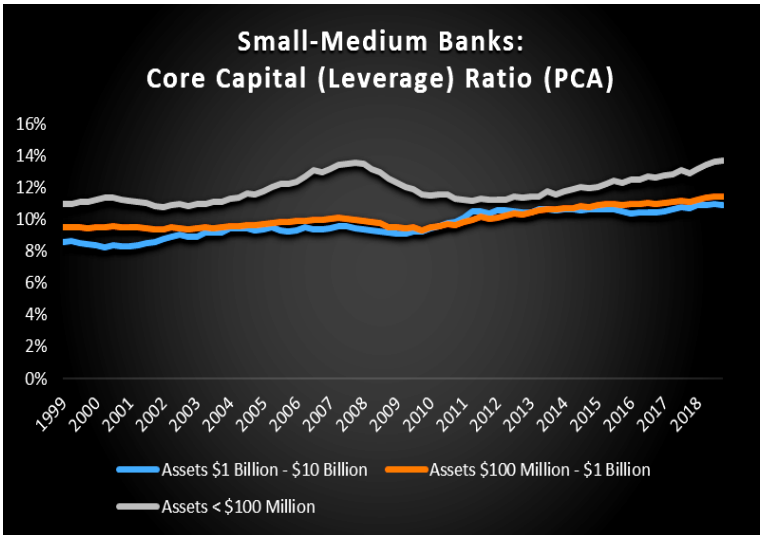


Figure 56:US Small-Medium Banks, Leverage Ratio (1999-2019)

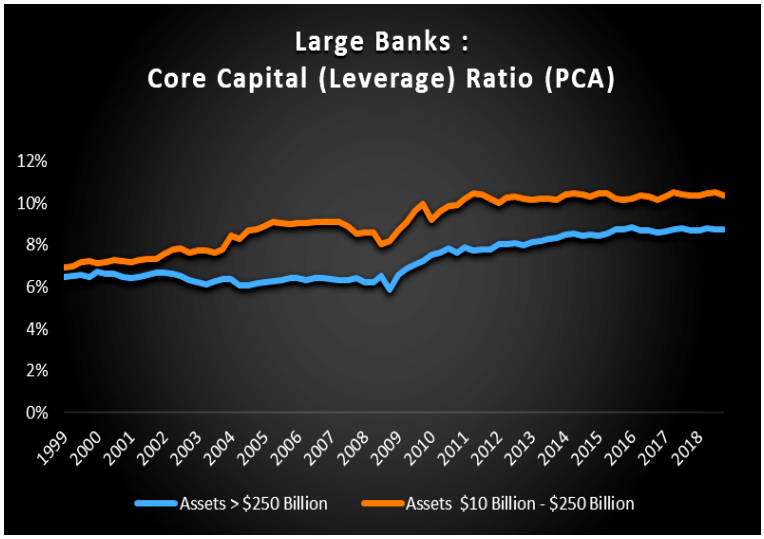


Figure 57: US Large Banks, Leverage Ratio (1999-2019)

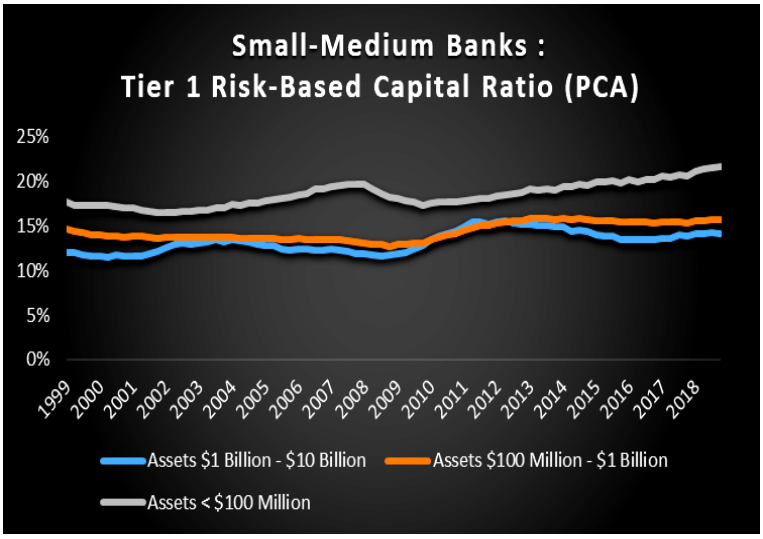


Figure 58: US Small-Medium Banks, Tier 1 (1999-2019)

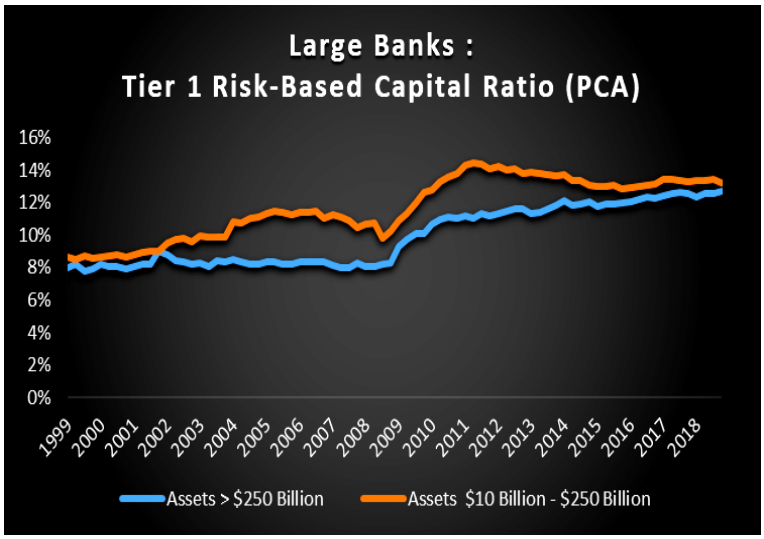


Figure 59: US Large Banks, Tier 1 (1999-2019)

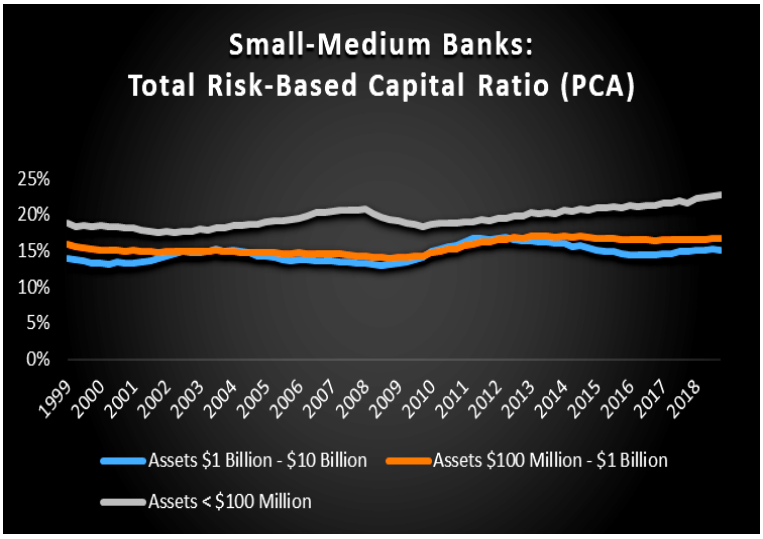


Figure 60: US Small-Medium Banks, Total Risk-Based Capital (1999-2019)

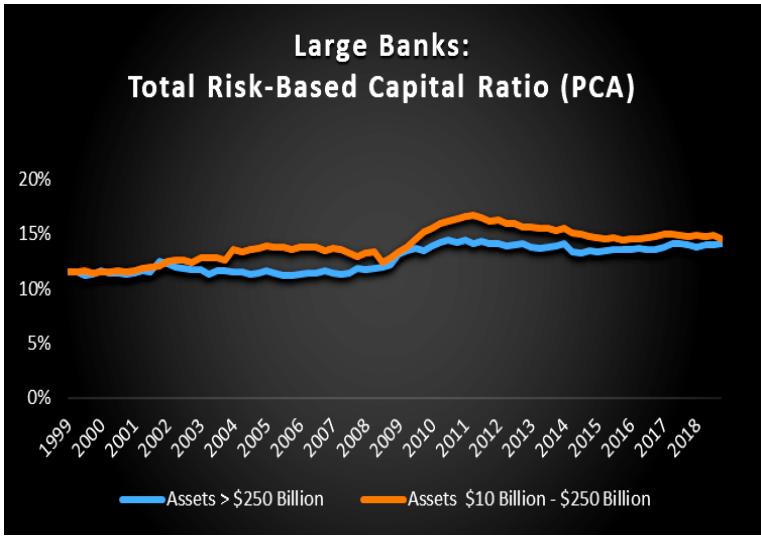


Figure 61: US Large Banks, Total Risk-Based Capital (1999-2019)

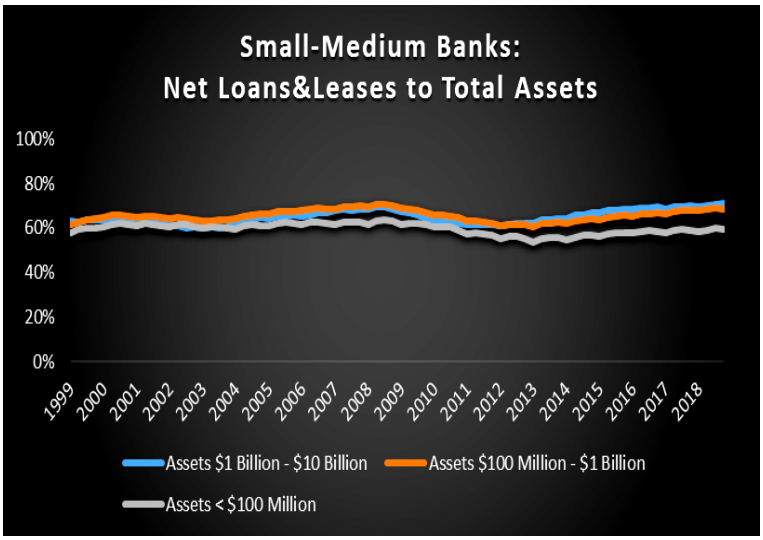


Figure 62: US Small-Medium Banks, Net Loans & Leases to Total Assets (1999-2019)

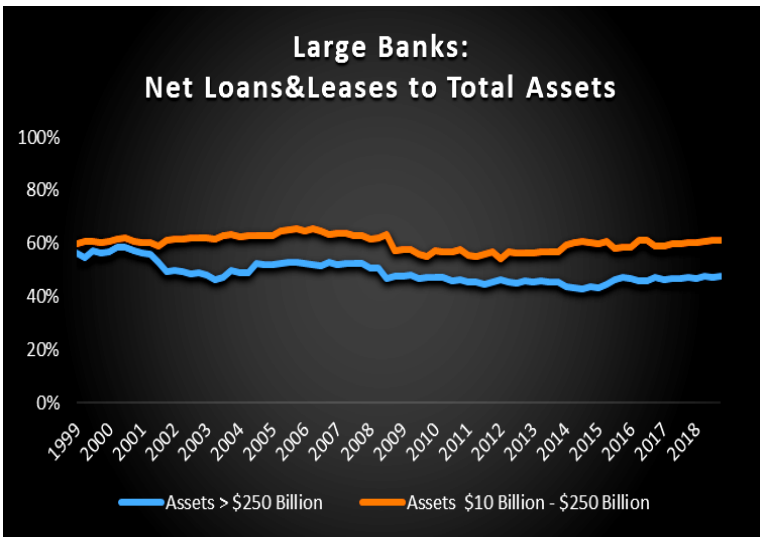


Figure 63: US Large Banks, Net Loans & Leases to Total Assets (1999-2019)

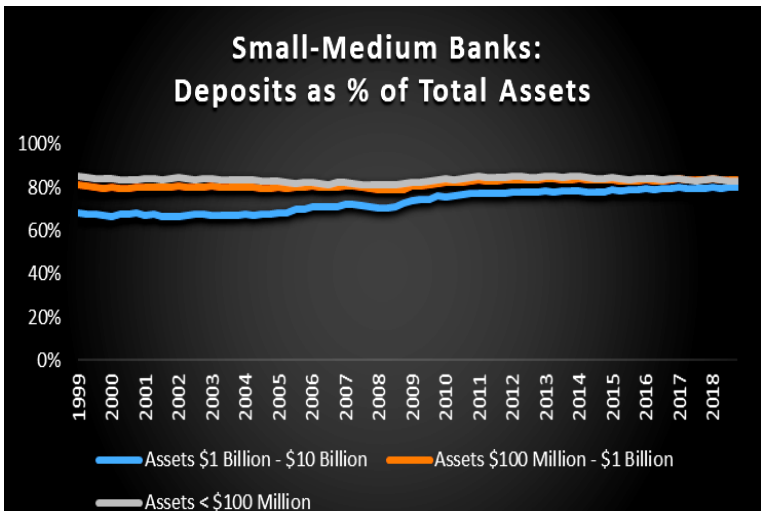


Figure 64: US Small-Medium Banks, Deposits as a % of Total Assets (1999-2019)

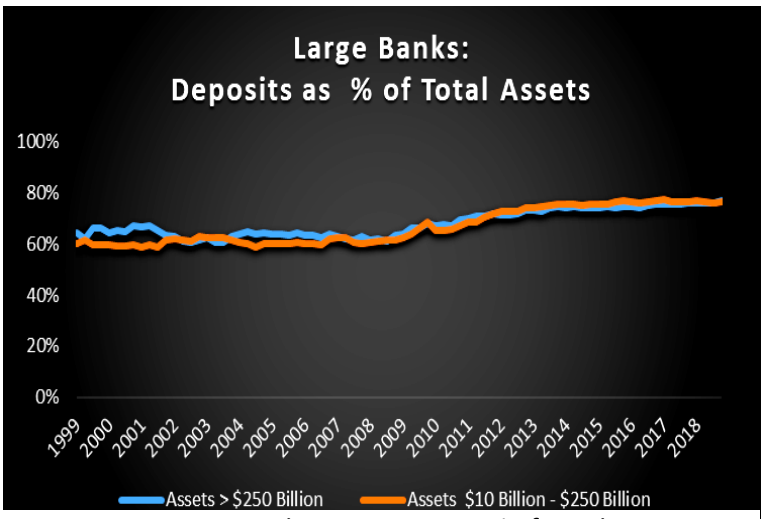


Figure 65: US Large Banks, Deposits as a % of Total Assets (1999-2019)

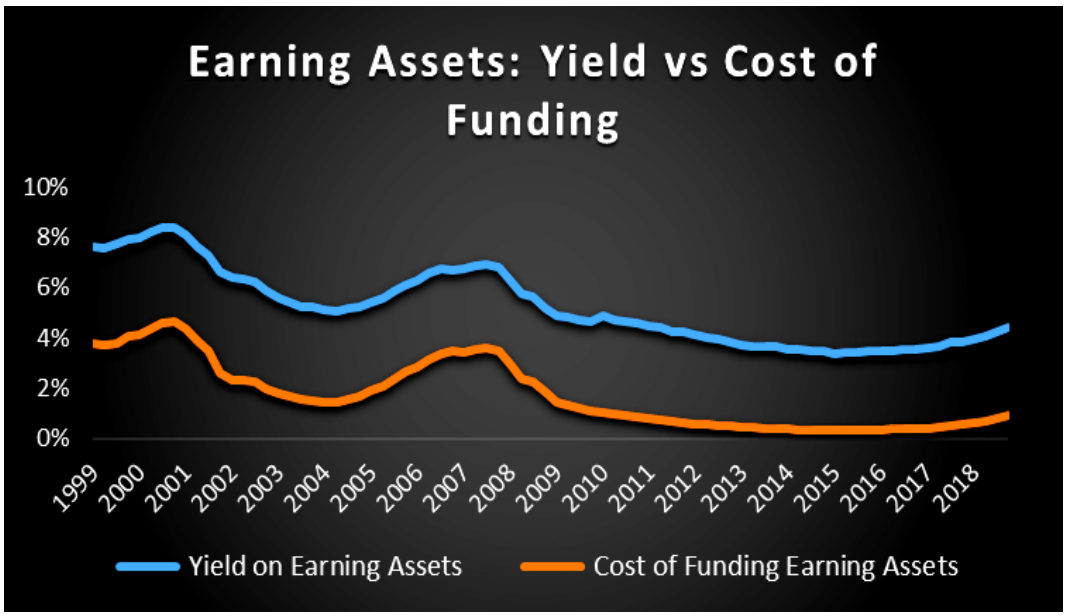


Figure 66: US Banks, Earning Assets: Yield vs Cost of Funding (1999-2019)

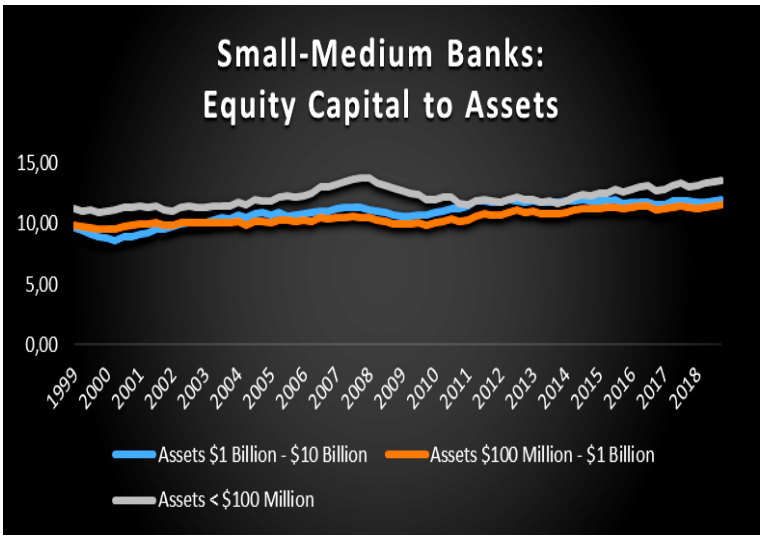


Figure 67: US Small-Medium Banks, Equity Capital to Assets (1999-2019)

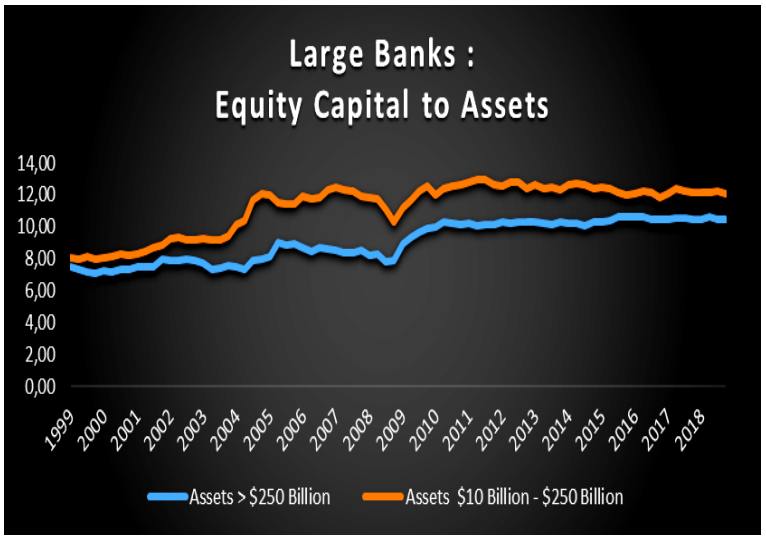


Figure 68: US Large Banks, Equity Capital to Assets (1999-2019)

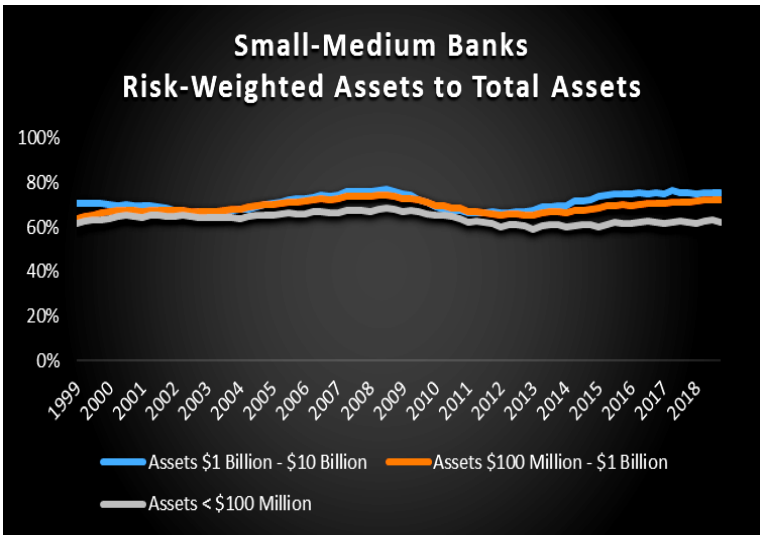


Figure 69: US Small-Medium Banks, Risk Weighted Assets to Total Assets (1999-2019)

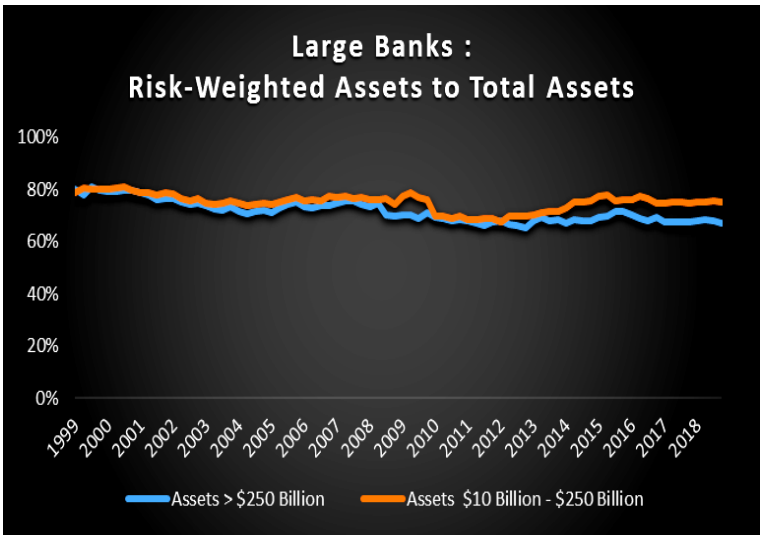


Figure 7.31: US Large Banks, Risk Weighted Assets to Total Assets (1999-2019)

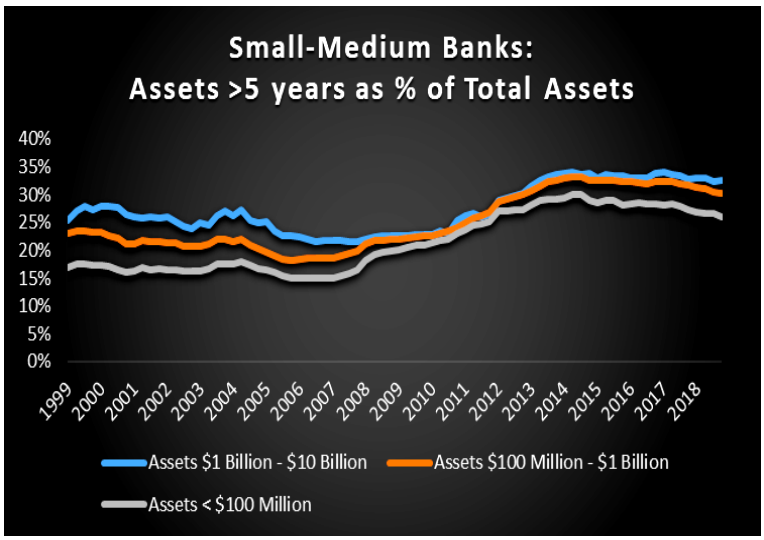


Figure 7.32: US Small-Medium Banks, Assets >5 years as % of Total Assets (1999-2019)

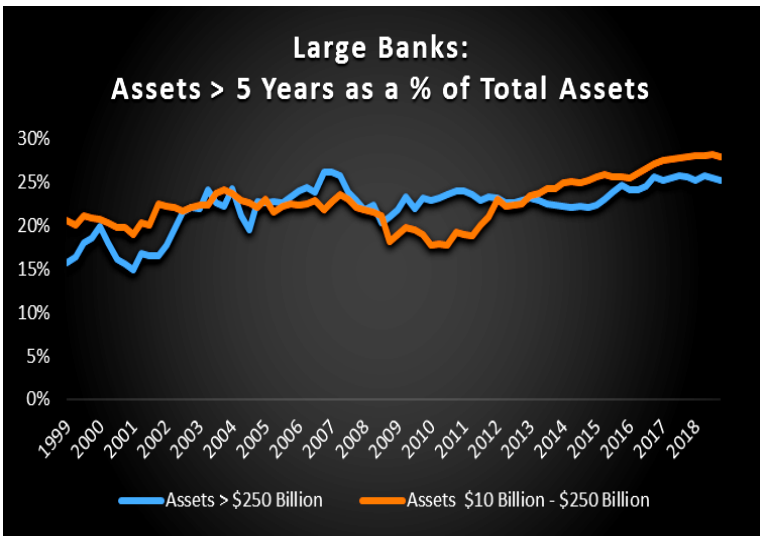


Figure 70: US Large Banks, Assets > 5 years as % of Total Assets (1999-2019)

Structure of Balance Sheet & Income Statement

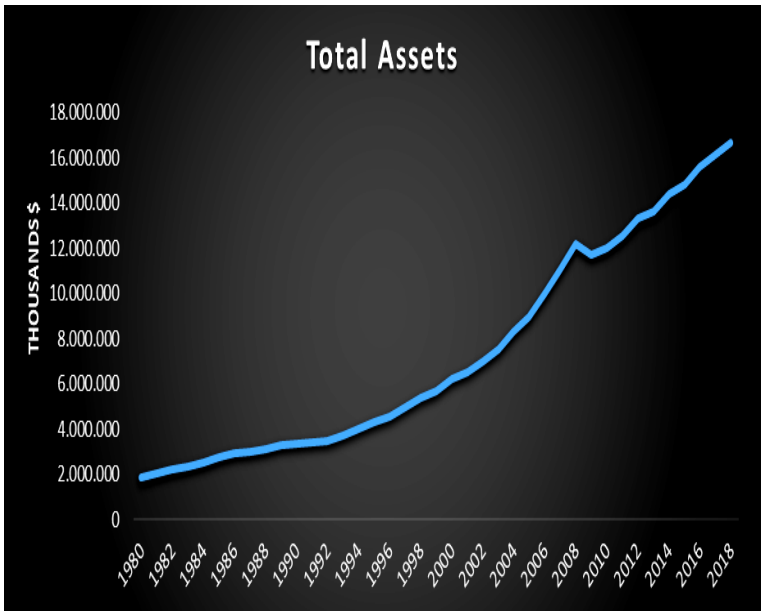


Figure 71: US Banks, Total Assets (1980-2019)

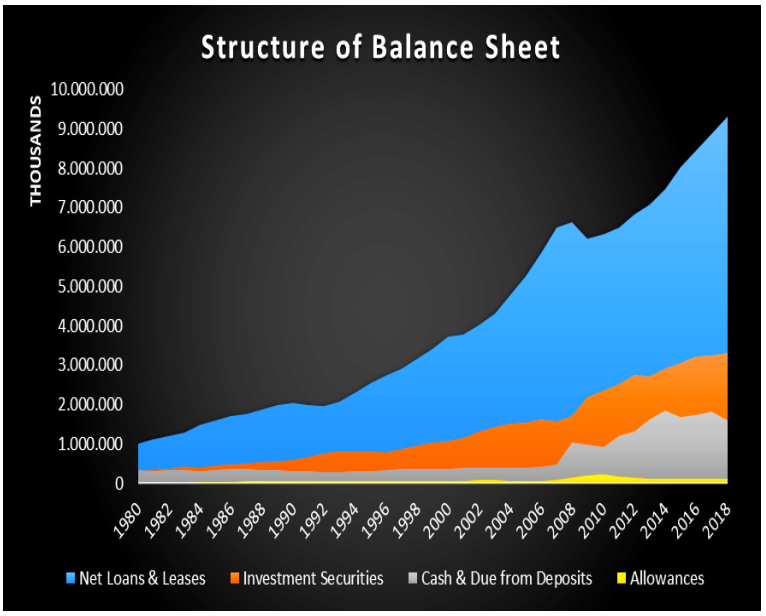


Figure 72: US Banks, Structure of Assets (1980-2019)

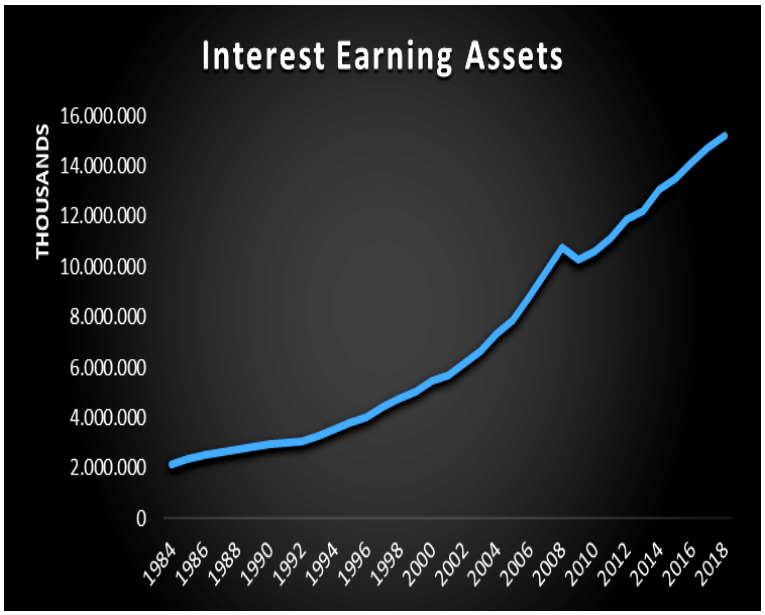


Figure 73: US Banks, Interest Earning Assets (1984-2019)

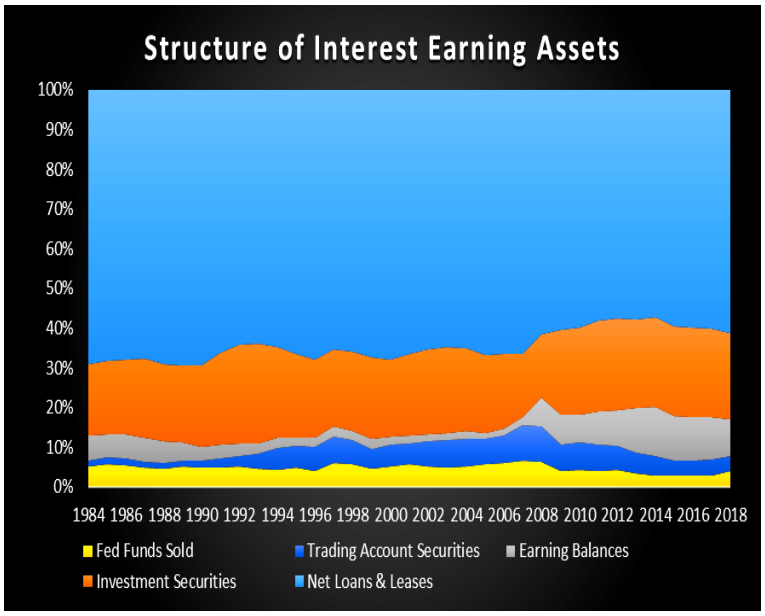


Figure 74: US Banks, Structure of Interest Earning Assets (1984-2019)

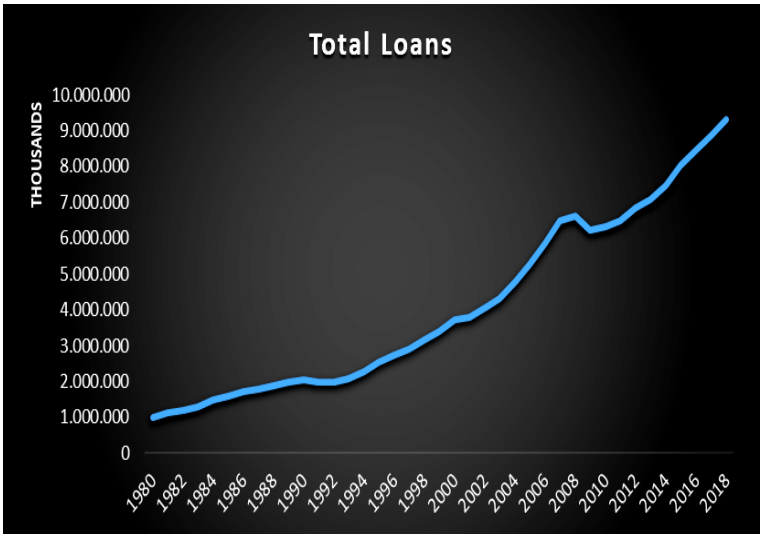


Figure 75: US Banks, Total Loans (1980-2019)

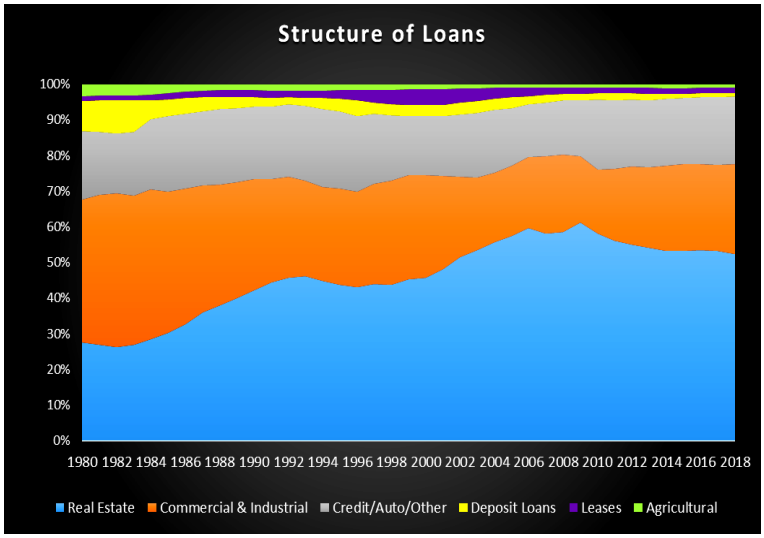


Figure 76: US Banks, Structure of Loans (1980-2019)

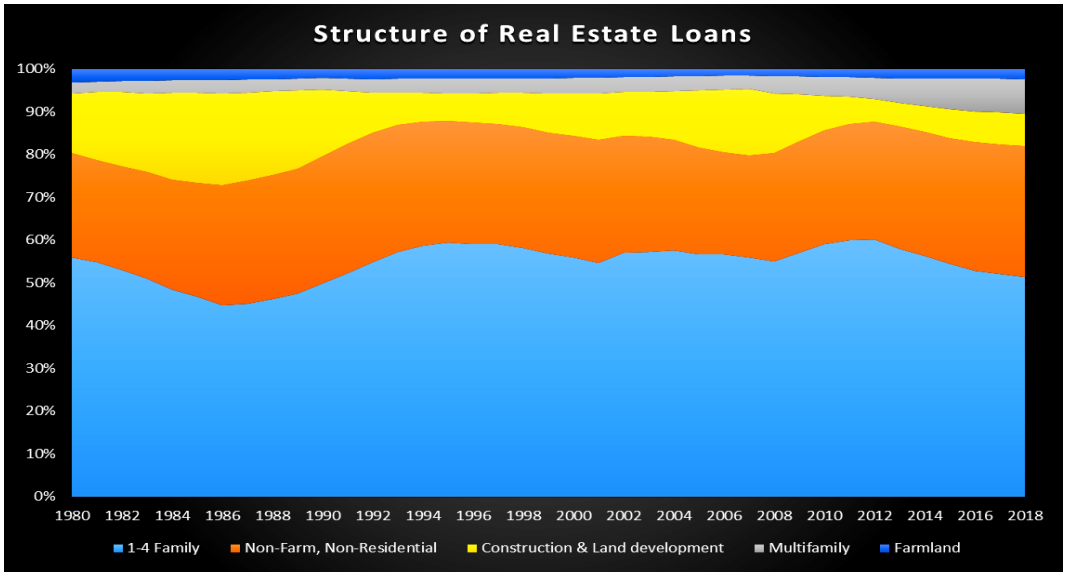


Figure 77: US Banks, Structure of Real Estate Loans (1980-2019)

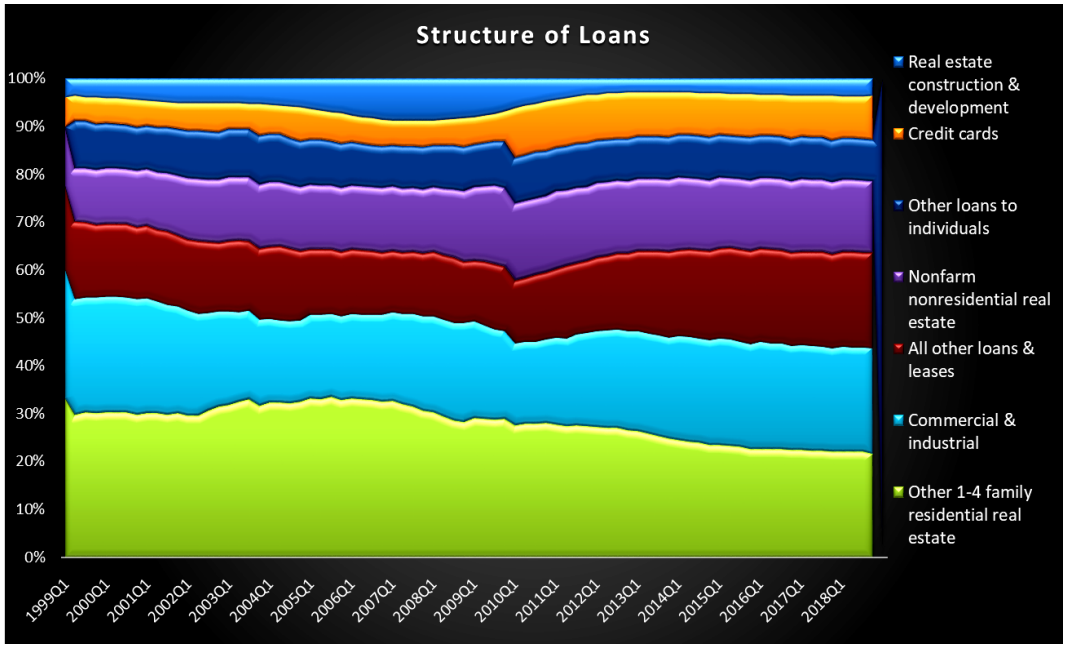


Figure 78: US Banks, Structure of Loans (1999-2019)

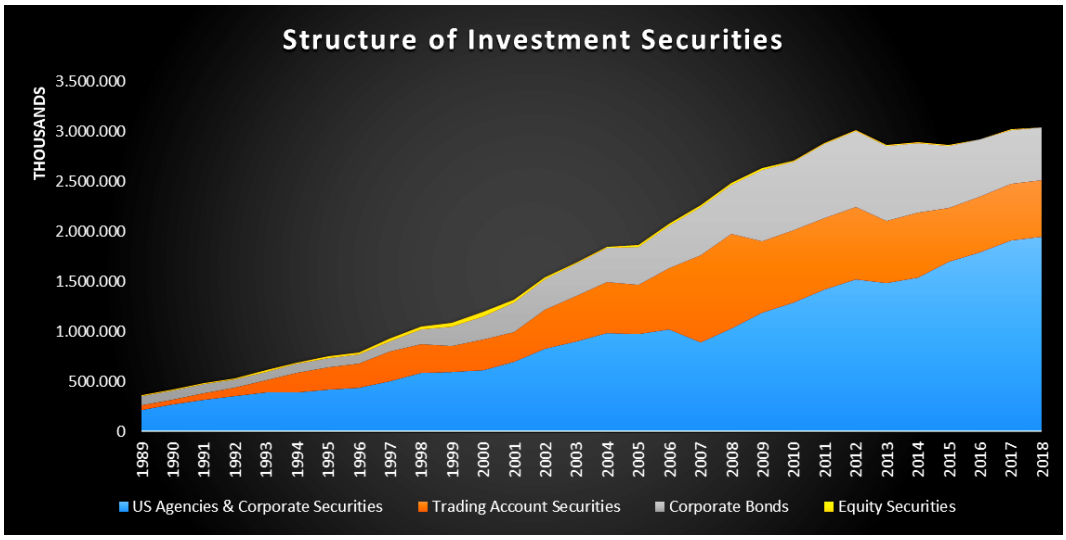


Figure 79: US Banks, Structure of Investment Securities (1989-2019)

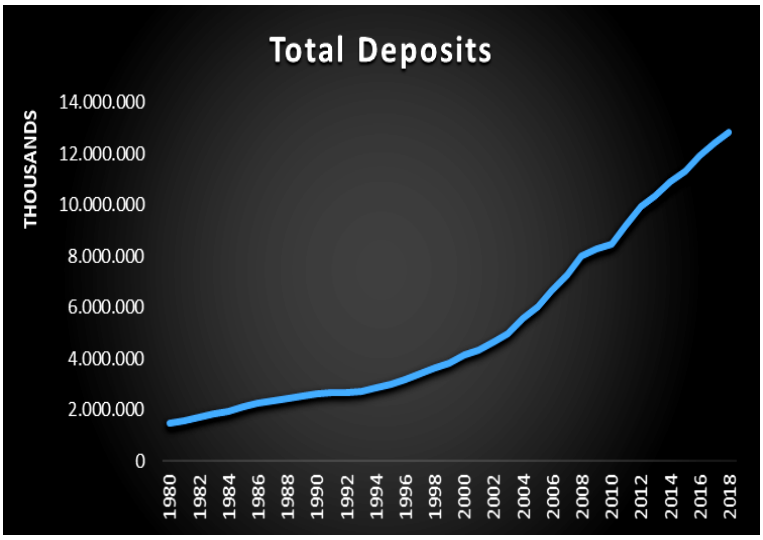


Figure 80: US Banks, Total Deposits (1980-2019)

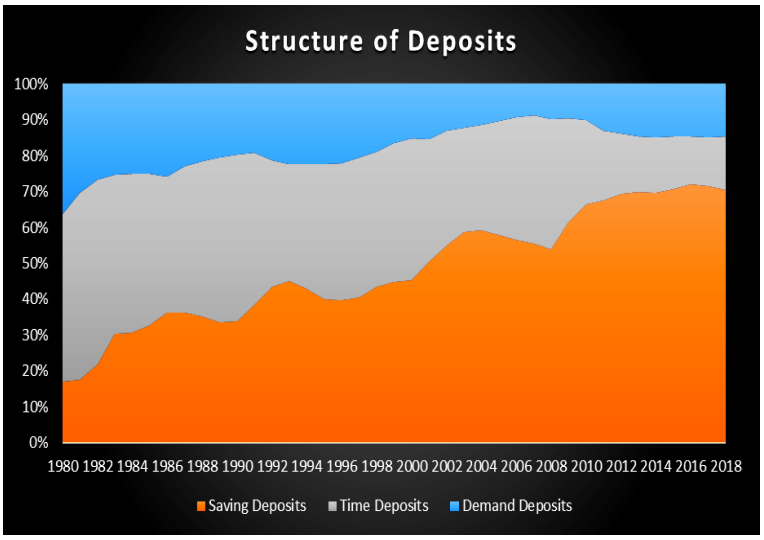


Figure 81: US Banks, Structure of Deposits (1980-2019)

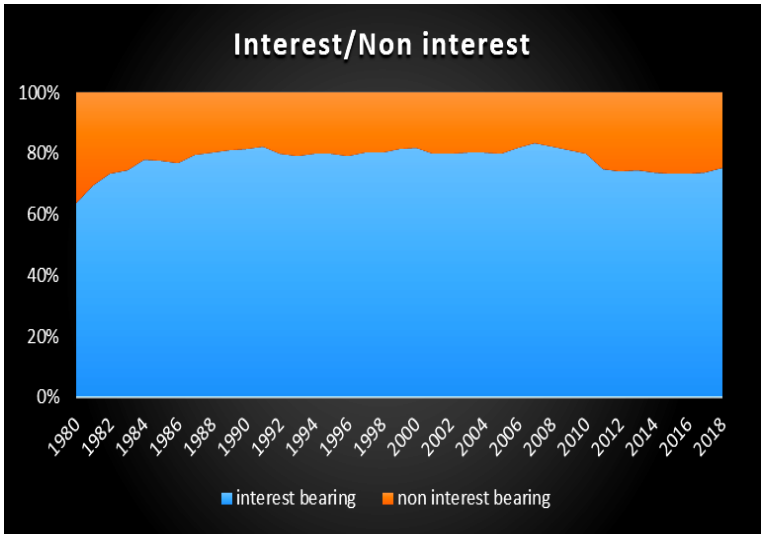


Figure 82: US Banks, Interest/Non-Interest Bearing Deposits (1980-2019)

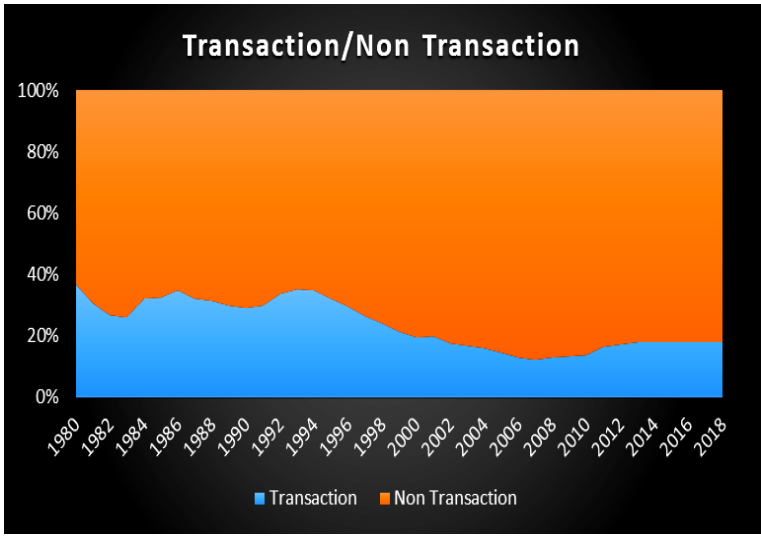


Figure 83: US Banks, Transaction/Non Transaction Deposits (1980-2019)

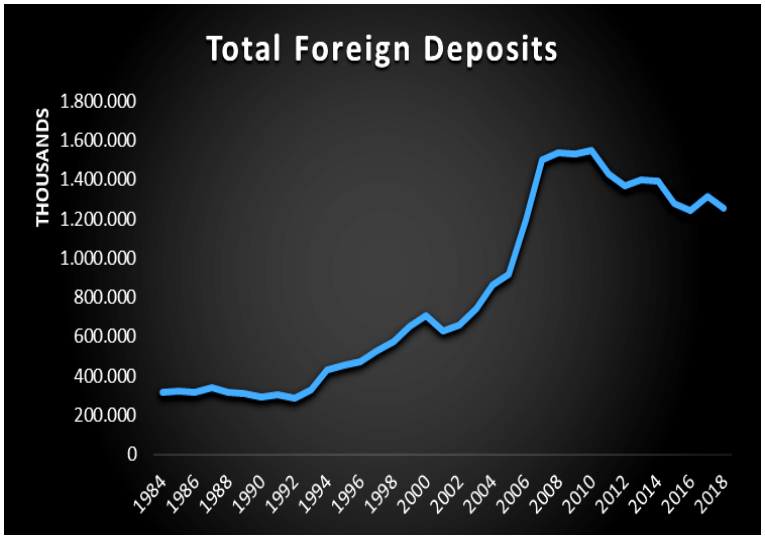


Figure 84: US Banks, Total Foreign Deposits (1984-2019)

Figure 85: US Banks, Total Interest Earning Liabilities (1984-2019)

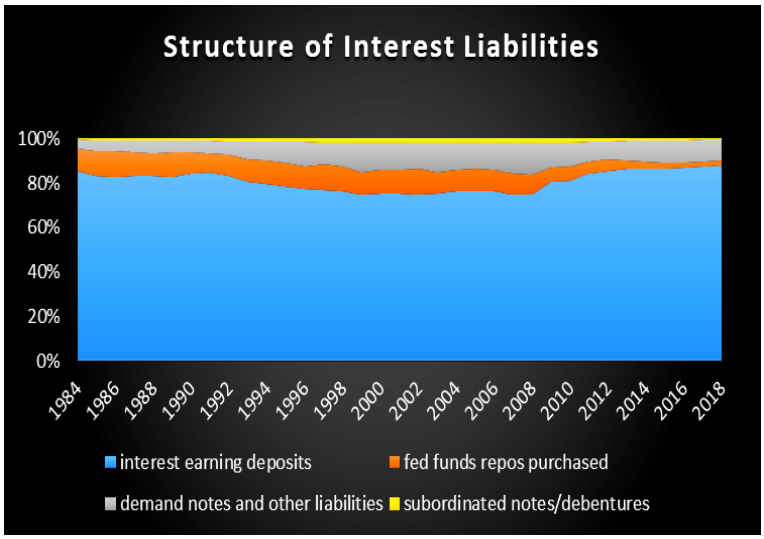


Figure 86: US Banks, Structure of Interest Liabilities (1984-2019)

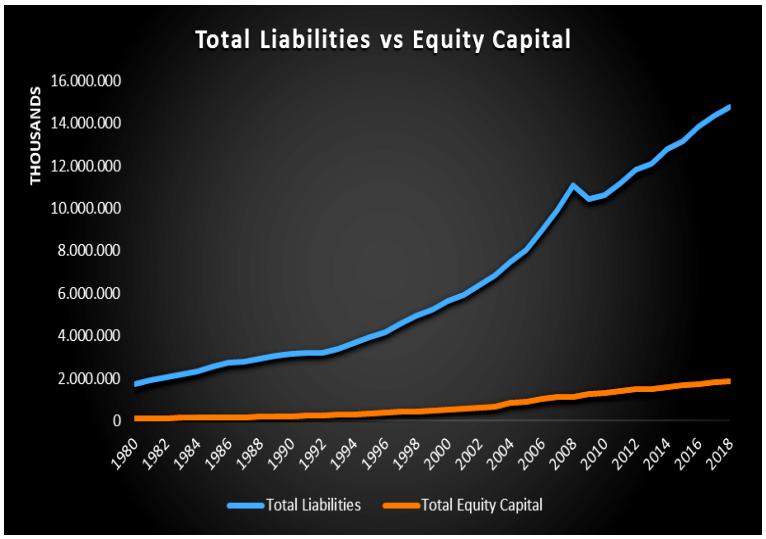


Figure 87: US Banks, Liabilities vs Equity Capital (1980-2019)

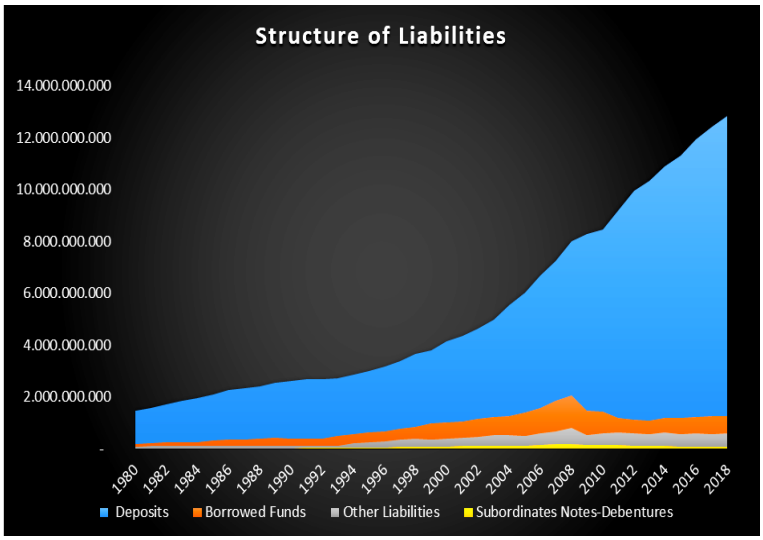


Figure 88: US Banks, Structure of Liabilities (1980-2019)

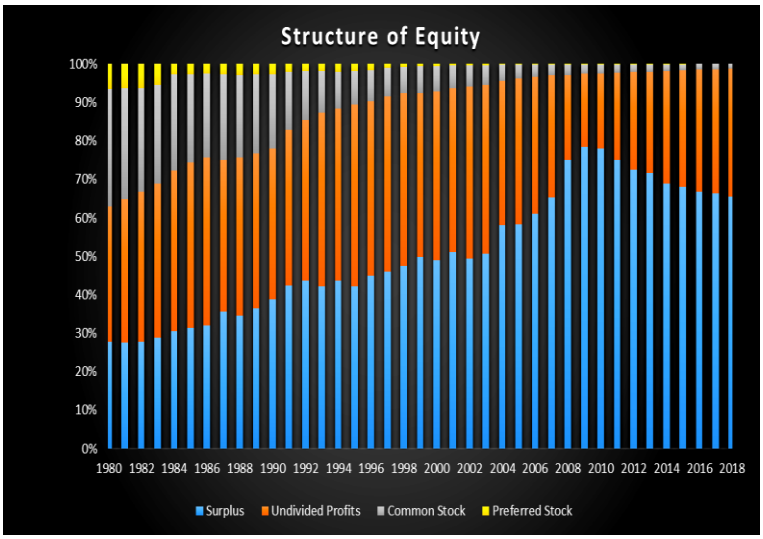


Figure 89: US Banks, Structure of Equity (1980-2019)

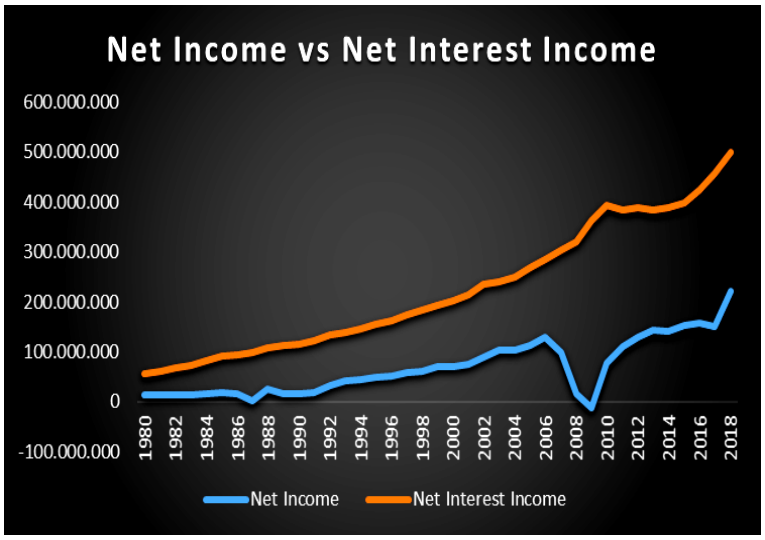


Figure 90: US Banks, Net Income Vs Net Interest Income (1980-2019)

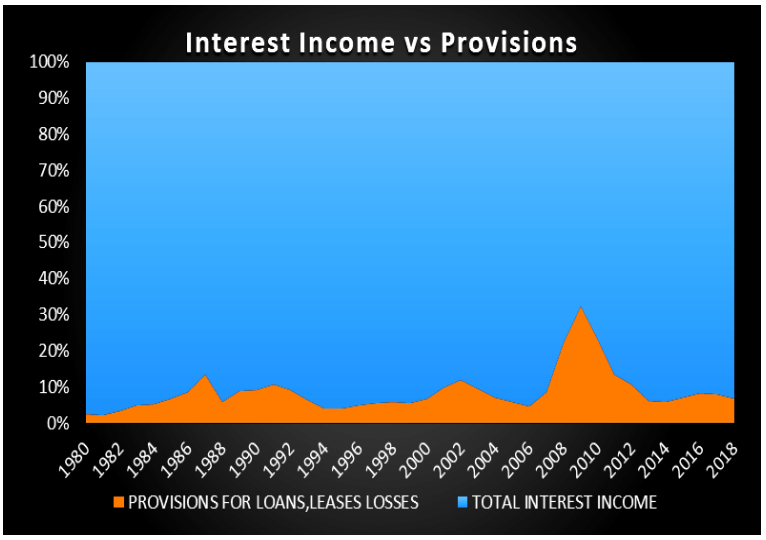


Figure 91: US Banks, Interest Income Vs Provisions (1980-2019)

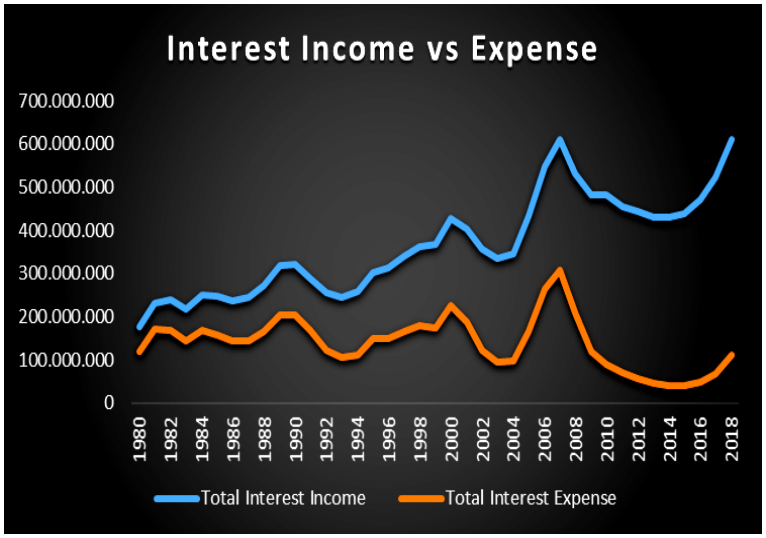


Figure 92: US Banks, Interest Income Vs Expense (1980-2019)

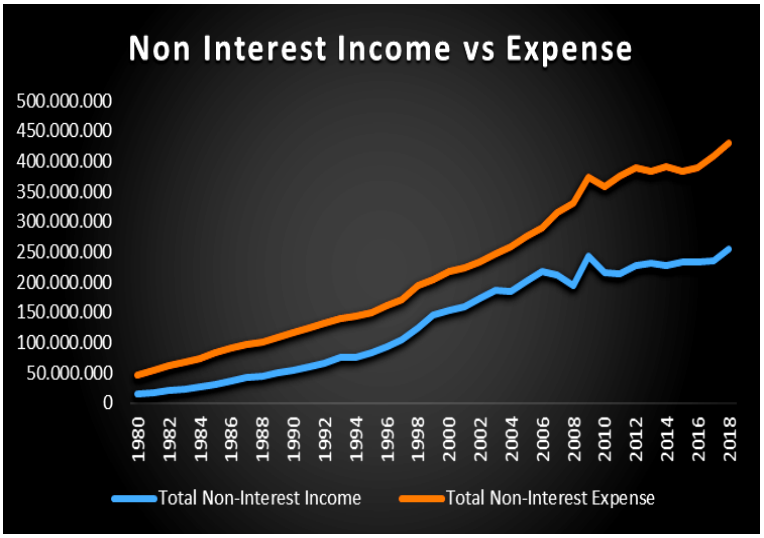


Figure 93: US Banks, Non-Interest Income Vs Expense (1980-2019)

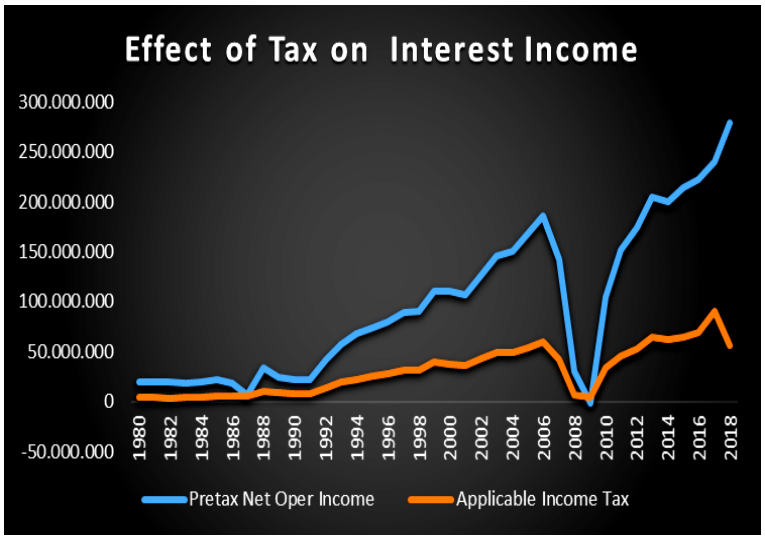


Figure 94:US Banks, Effect of Tax on Interest Income (1980-2019)

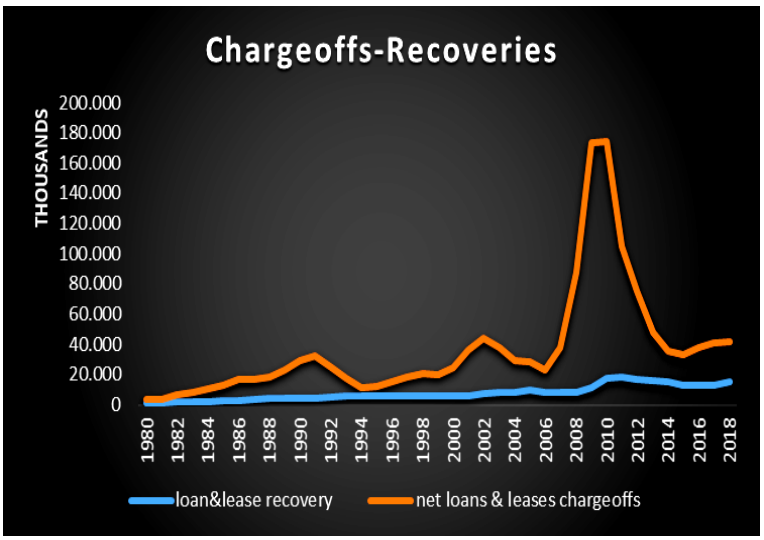


Figure 95: US Banks, Charge Offs-Recoveries (1980-2019)

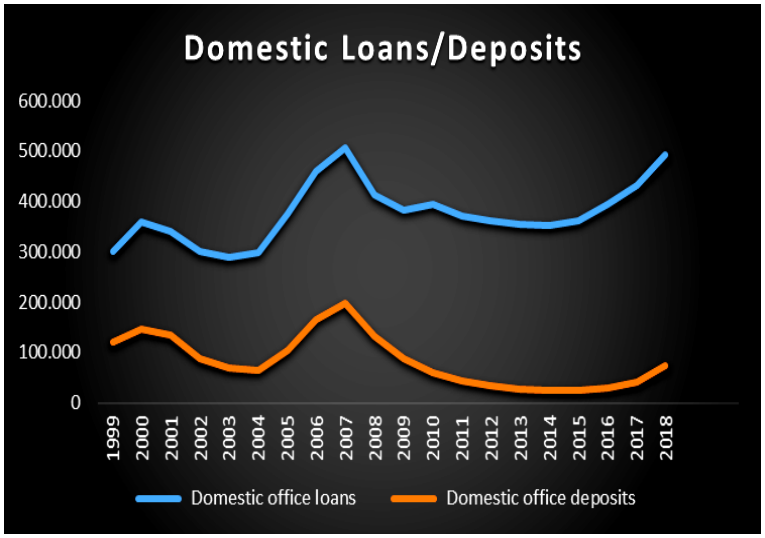


Figure 96: US Banks, Domestic Loans Vs Deposits (1999-2019)

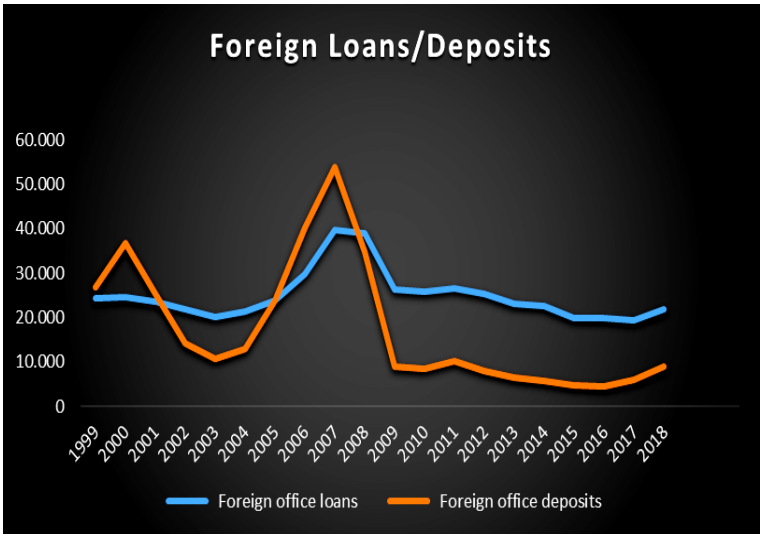


Figure 97: US Banks, Foreign Loans Vs Deposits (1999-2019)

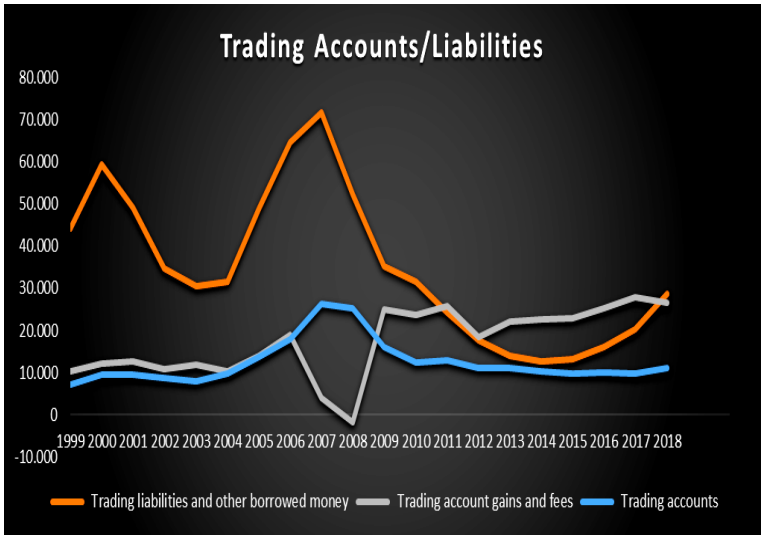


Figure 98: US Banks, Trading Accounts Vs Liabilities (1999-2019)

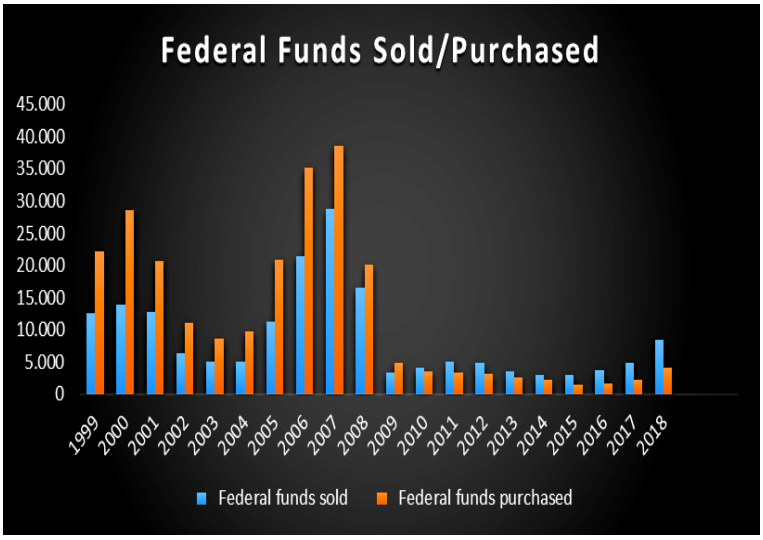


Figure 99: US Banks Federal Funds Sold Vs Purchased (1999-2019)

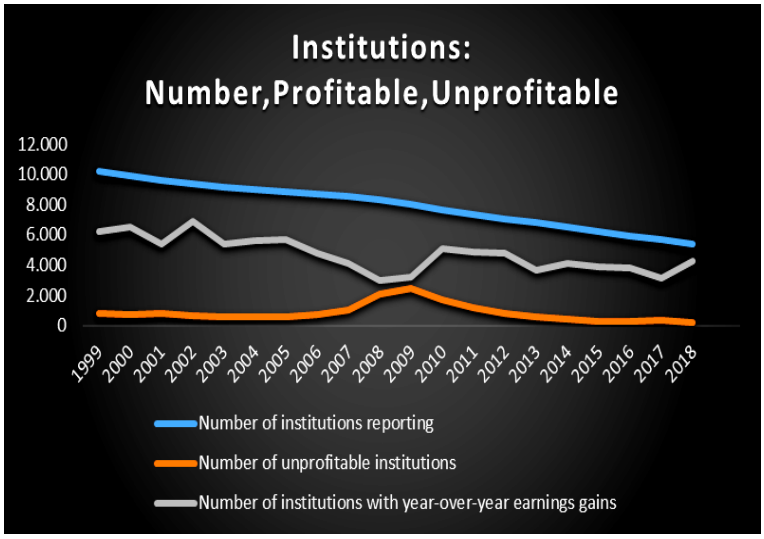


Figure 100: US Banks, Number & Profitability (1999-2019)

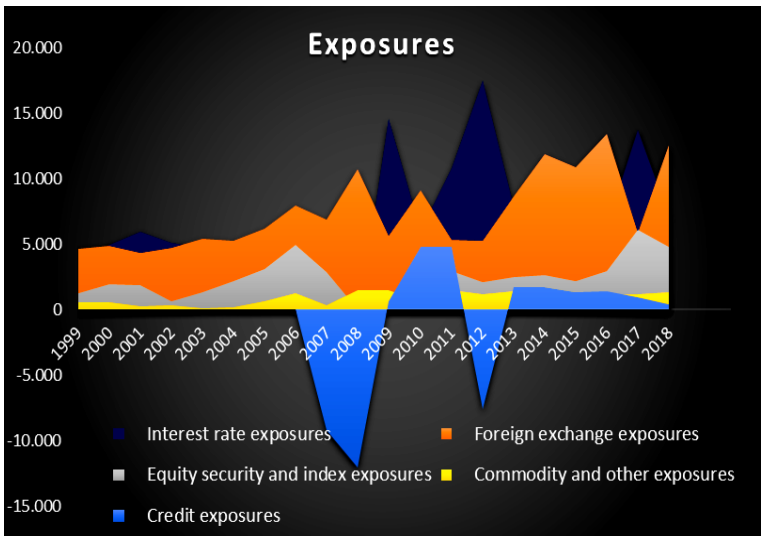


Figure 101: US Banks, Exposures (1999-2019)

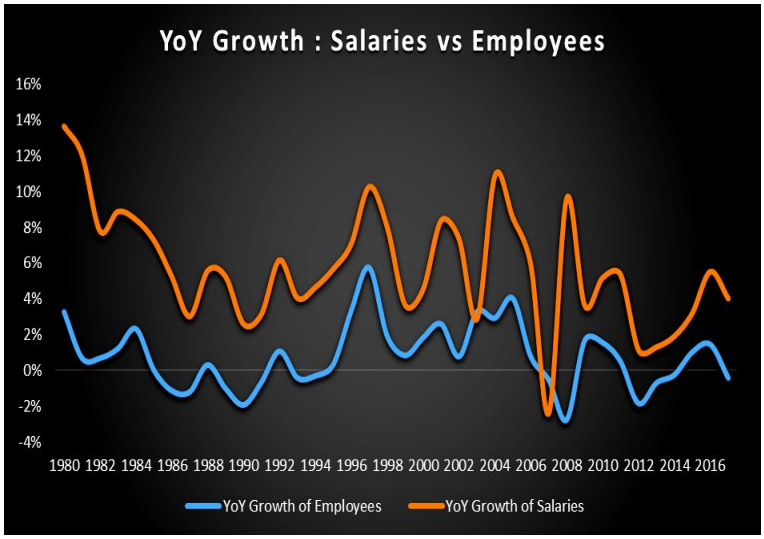


Figure 102: US Banks YoY Growth of Salaries Vs Employees (1980-2019)

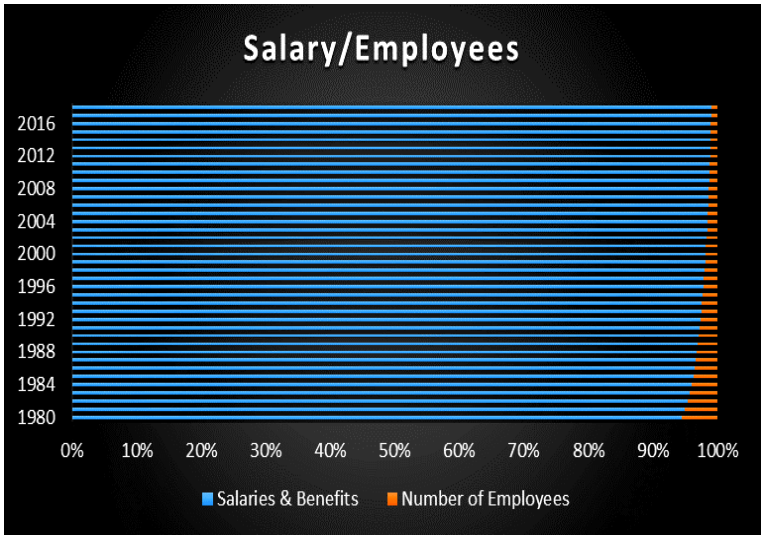


Figure 103: US Banks, Salaries to Employees comparison (1980-2019)

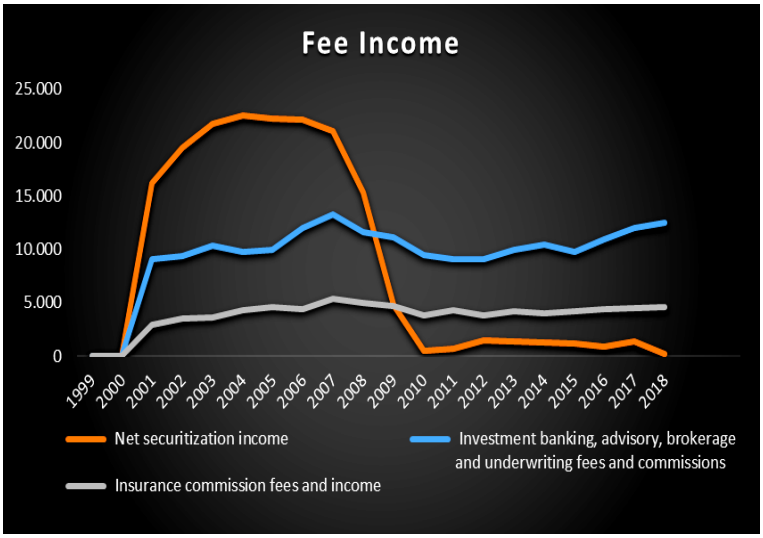


Figure 104: US Banks, Fee Incomes (1999-2019)

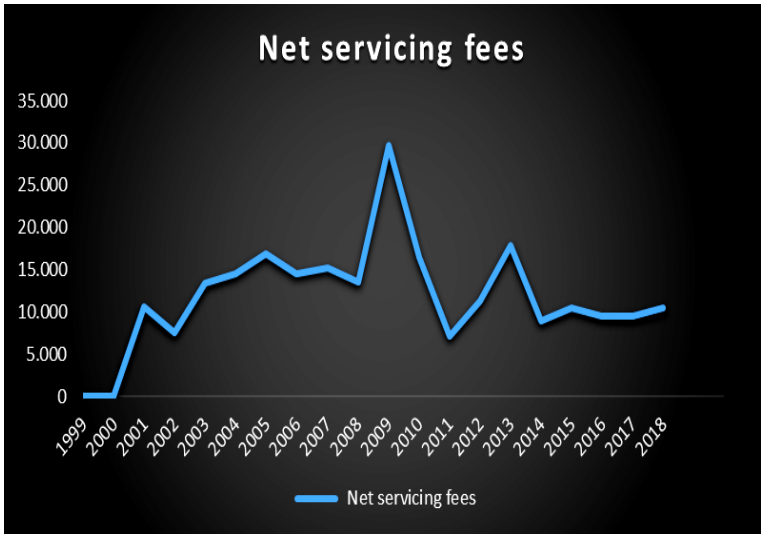


Figure 105: US Banks, Servicing Fees (1999-2019)

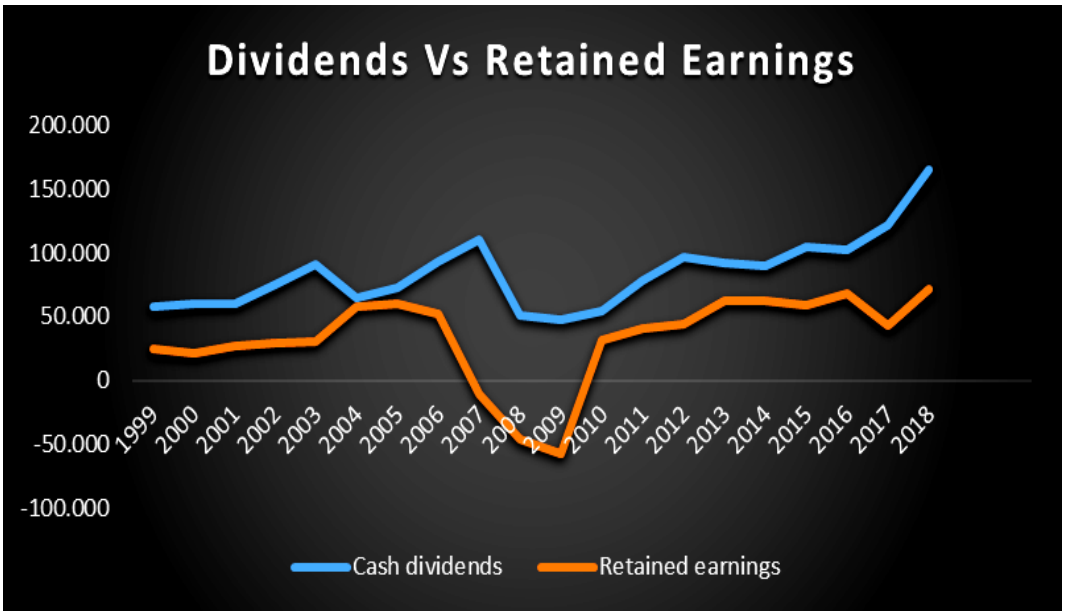


Figure 106: US Banks, Dividends vs Retained Earnings (1999-2019)

Brief Comments on the Structure of US Banks

Looking at technical and ratios, we can observe that all banks have been struck by the Recession of 2008 and experienced significant drops to their profitability ratios (ROA, ROE). In terms of ROA, there is no significant difference between small-medium and large banks. However, in terms of ROE, we can observe that small-medium banks have recovered better after the recession of 2008 and present higher ROE ratios than large banks. A potential reason for this can be attributed to increased Compliance costs and scrutiny of Large banks stemming from the Dodd-Frank Act. However, when we examine the percent of banks that showcase quarterly losses, it is evident that small-medium banks after the recession of 2008 present more significant losses than large banks that present very low levels. This situation can be attributed to the fact that smaller banks are subjected to the same increased Compliance costs of the Dodd-Frank Act even though they do not necessarily hold the same amount of systemic risk and resources. This can also potentially explain the rise of Mergers observed after 2010 since the viability of smaller banks is hurt from the Dodd-Frank Act; they resort to Mergers in an effort to reduce the impact of these costs.

In terms of Net Interest Margin, Efficiency, and Coverage Ratios, we can observe that all banks are almost in par; however, smaller banks appear to be relatively more efficient. In terms of Risk capital ratios, we can observe that small-medium banks showcase relatively higher capital adequacy than large banks. Regarding the Structure of Balance Sheets and Income Statements, we can observe that for all banks, the major part of their Assets (60%) is based on Loans indicating a high exposure to Lending risk but high Profitability prospects as well. In terms of Deposits to Assets again, the Ratios are high indicating high stable sources of Funding. In terms of Equity Capital to Assets, we can observe that all banks hold approximately 12-13 % percent of Equity Capital, with the exception of huge banks that hold approximately 8-10%. The Risk-Weighted Asset levels for all banks are almost in par around 70%+. Regarding the Maturity of Assets, all banks hold almost between 25% and 30% of > 5 years Assets.

Following on with the Structure of Assets we can observe that the majority of Assets consists of Loans and Investment Securities and after the Recession of 2008 the cash positions of banks have increased and the trading account activities have decreased as a result of the changes introduced by Dodd-Frank Act (Volcker Rule). In regards to the Structure of Loans, we can notice that the majority is mostly comprised of Mortgages and Commercial Real Estate Loans. As far as the other categories are concerned, we can observe that all loans that are associated with Commercial, Industrial, Construction and Agricultural purposes, along with leases, have gradually decreased. This trend possibly indicates the transformation of the economic model of the US that occurred after 1980. In particular, the manufacturing base has been decomposed and outsourcing of business activities had been directed to Asia and the driving force of the economy has been centered around the housing market and leverage. However, loans that are associated with consumers such as credit card, auto, and student loans have significantly increased. Regarding the Structure of Investment securities these mostly consist of US government securities and Corporate Bonds. Regarding the Structure of Deposits, these mostly consist of non-transaction interest-bearing Saving Deposits. In regards to the levels of domestic loans and foreign loans, domestic loans have been increasing after 2008 and the foreign loans have been decreasing. The deposits have both been decreasing. The structure of Equity consists mostly of Surpluses and Undivided profits. Generally, we can infer that the Interest activities of US Banks' are increasing despite the drop during 2008 but the Non Interest activities are less profitable as the expense outweighs the income. The high level of profitability in the Interest Income activities has not been accompanied by high levels of provisions. In addition, even though the Net Interest Income is substantially high, this does not translate into the same level of Net Income as many costs accumulate and lower the overall Net Income of banks. Another observation that stands out is associated with the Number of Employees and their salaries. Notably, we can observe an immense increase in salaries but at the same time, these salaries are accumulating in a gradually declining number of employees. Finally, an interesting observation is associated with the significant increase of Fee Income that represents the change in the role of banks and their activities after 1999. The Mortgage bubble is particularly distinctive by examining the huge increase and the subsequent drop of the Net Securitization income that drove the new model of Originate and Distribute that led to the Recession of 2008. Overall, we can notice that the total number of Assets and Liabilities has been increasing without being accompanied by a commensurate increase in Equity Capital.

C. Financial Stability in the US: Risk Vulnerabilities.

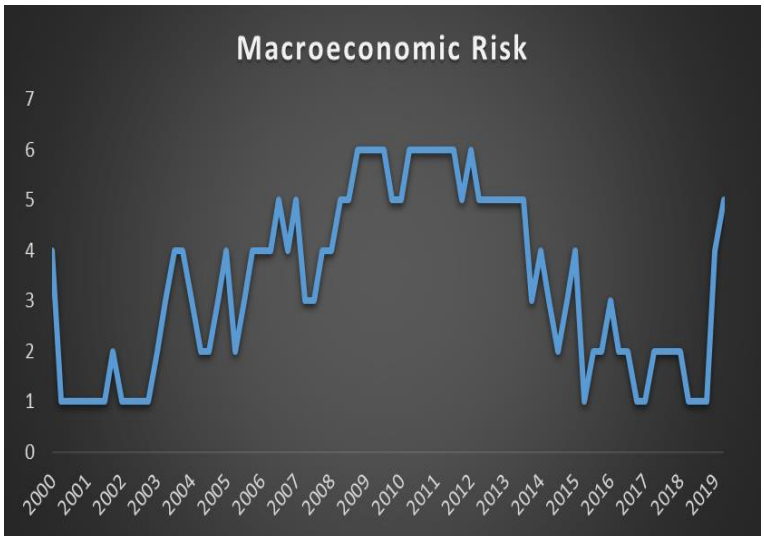


Figure 107 : US Macroeconomic Risk (2000-2019)

Figure 108: US Market Risk (2000-2019)

Figure 109: US Credit Risk (2000-2019)

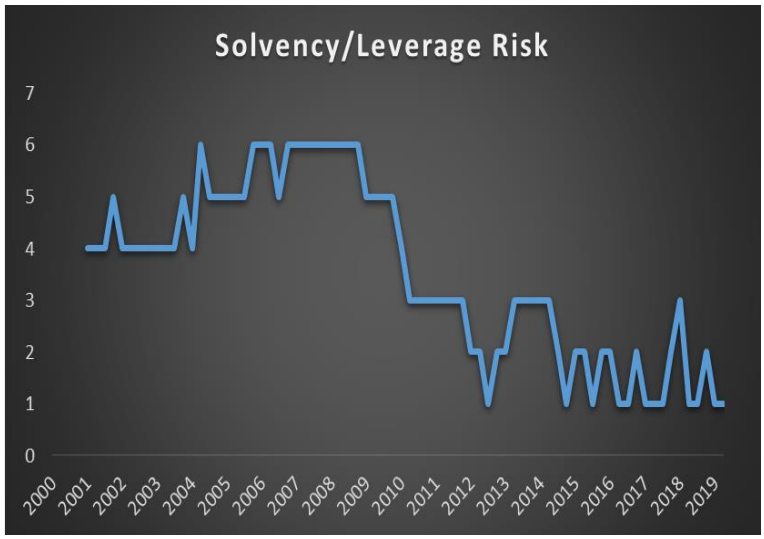


Figure 110: US Solvency/Leverage Risk (2000-2019)

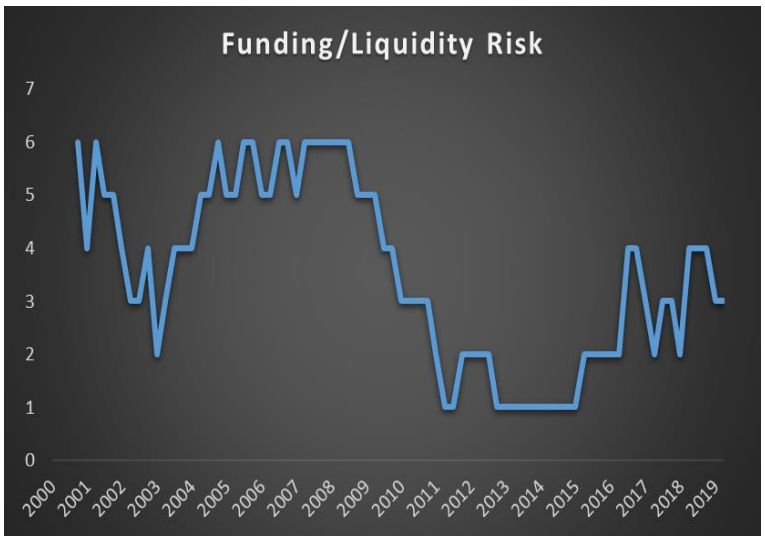


Figure 111: US Funding/Liquidity Risk (2000-2019)

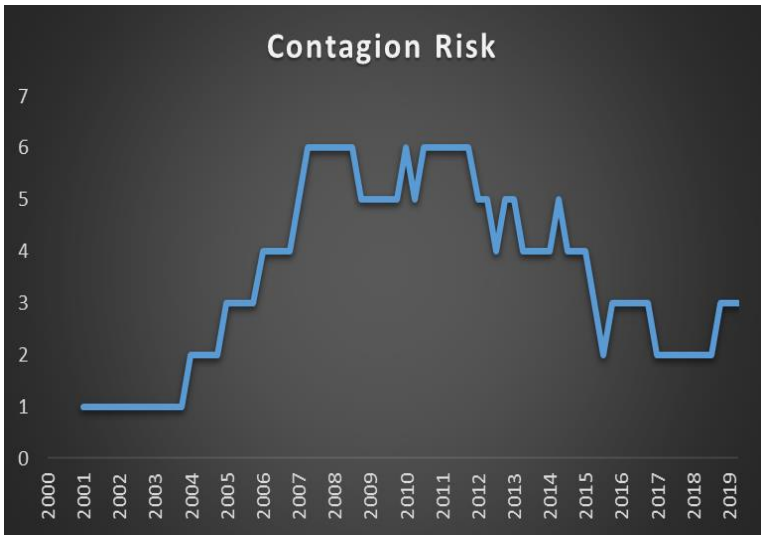


Figure 112: US Contagion Risk (2000-2019)

Table of Figures