

“A tale of two banking systems: the performance of U.S. and European banks in the 21st century”

AUTHORS	Robert A. Weigand
ARTICLE INFO	Robert A. Weigand (2015). A tale of two banking systems: the performance of U.S. and European banks in the 21st century. <i>Investment Management and Financial Innovations</i> , 12(1-1), 146-162
RELEASED ON	Tuesday, 07 April 2015
JOURNAL	"Investment Management and Financial Innovations"
FOUNDER	LLC "Consulting Publishing Company "Business Perspectives"



NUMBER OF REFERENCES

0



NUMBER OF FIGURES

0



NUMBER OF TABLES

0

© The author(s) 2024. This publication is an open access article.

Robert A. Weigand (USA)

## A tale of two banking systems: the performance of U.S. and European banks in the 21<sup>st</sup> century

### Abstract

The author compares the financial performance, growth, asset mix, risk, operational efficiency, profitability and capital holdings of the 20 largest commercial banks in the U.S. and Europe from 2001 to 2013. U.S. banks earned significantly larger stock returns than their European counterparts in the post-crisis years, accompanied by higher rates of revenue and loan growth, lower risk, and superior profitability and loan quality. European banks, on the other hand, remain trapped in a downward spiral of negative revenue and loan growth, decreasing profitability, increasing impaired and nonperforming loans, and are sporting market value to debt ratios that suggest imminent insolvency. U.S. banks display their own post-crisis irregularities, however, including unusually low loan loss allowances relative to their impaired loans, paying smaller dividends to investors and lower interest to depositors compared with Eurozone banks, and a 5% decline in their average effective tax rate compared with the pre-crisis period. U.S. banks appear to be as well-capitalized and hold lower levels of investment and trading assets than European banks, but regulatory loopholes that allow U.S. banks to account for trillions of dollars of derivatives positions off-balance sheet render these comparisons less than fully meaningful. Despite unprecedented central bank intervention, the stock returns of both U.S. and European banks have remained significantly related to market and bank-level fundamentals following the financial crisis. Modeling bank returns as a function of their profitability, growth and solvency explains 44% to 60% of the variation in U.S. and European bank stock prices, respectively.

**Keywords:** commercial banking, bank capital, regulation, risk, stock returns, profits.

**JEL Classification:** G18, G21.

### Introduction

While commercial banking in the U.S. is completing its recovery from the financial crisis of 2008-2009 (Weigand, 2013), the outlook for European banks remains far more precarious. Factors such as the persistent economic disparity between stronger and weaker Eurozone countries and the European Central Bank's painfully slow efforts to reduce exposure to systemic risk, compared with countries such as the U.S. and the U.K. (Avadi, Arbak and de Groen, 2012), have led some researchers to conclude that "... despite some apparent short-term relief ... the long-term picture remains both complex and uncertain" (Gerken et al., 2013, p. 1). Other studies have questioned the very solvency of Eurozone banks (Acharya and Steffen, 2014), as potentially destabilizing developments have erupted in countries such as Portugal (Banco Espirito Santo has sought protection from its creditors), Austria, and even Germany, the Eurozone's undisputed economic leader. For example, Deutsche Bank was cited by the New York Federal Reserve Bank in 2014 as suffering from numerous problems, including "shoddy reporting and inadequate auditing and oversight" and "misstated regulatory reports" which constitute a "systemic breakdown that exposes the firm to significant operational risk" (Enrich, Strasburg and Henning, 2014, p. 1). Moreover, events such as these continue to spawn unprecedented reactions that will have long-lasting implications, such as the recent legal decision that

allows European countries to shift risk to depositors by reneging on deposit insurance if another systemic crisis occurs (Coppola, 2014). The need to obtain advance permission for such drastic remedies creates uncertainty over whether Europe is more focused on restoring the financial health of its banking sector or making preparations to cope with another looming crisis.

The financial condition of U.S. commercial banks contrasts sharply with that of their European counterparts. By the end of 2012, 15 of the 20 largest commercial banks in the U.S. posted record-setting revenues, with 12 of these banks also earning record profits (Weigand, 2013). The financial performance of these banks has convinced many that they are ready to compete in a free market environment once again and require no further regulatory support. Accordingly, the U.S. Federal Reserve confirmed in the minutes of its July 2014 meeting that it will continue tapering its controversial quantitative easing program, which was terminated in October, 2014<sup>1</sup>.

In this paper I compare the financial performance, growth, asset mix, risk, operational efficiency, profitability and capital holdings of the 20 largest commercial banks in the U.S. and Europe from 2001-2013. I focus on the largest commercial banks because the global economy depends on the

---

<sup>1</sup> It is important to note that "terminate" does not imply a complete cessation of bond buying or reducing the size of the U.S. Federal Reserve's balance sheet, which quintupled to \$4.5 trillion since 2008. The U.S. Fed will buy new bonds when the bonds they currently own mature, with the goal of growing their balance sheet more slowly.

financial health of these banking giants and their ability to supply credit, as well as the fact that they are most likely to have the resources to adapt quickly to the new regulatory framework mandated by the Dodd-Frank act and Basel III accord. Moreover, these banks receive a disproportionate amount of regulatory scrutiny, because banks of this size and scope are the dominant players in their industry and are most important systemically. I also investigate whether the stock returns of these banks have remained significantly related to business and market fundamentals (such as profitability and interest rates) since the turn of the century, given the aggressive central bank and government intervention that has been in place since the 2008 financial crisis.

I find that U.S. banks earned significantly larger stock returns than their European counterparts in the post-crisis years, accompanied by higher rates of revenue and loan growth, superior profitability and loan portfolio quality, and lower risk. European banks, on the other hand, remain trapped in a downward spiral of negative revenue and loan growth, decreasing profitability, rising rates of impaired and nonperforming loans, and borderline insolvency.

U.S. banks have their own financial and operational irregularities, however, including carrying unusually low loan loss allowances relative to their impaired and nonperforming loans, which remain elevated. U.S. banks are enjoying other operational advantages post-crisis, including paying smaller dividends to investors and lower interest to depositors compared with Eurozone banks, and paying an average effective tax rate that is a full 5% lower than they paid pre-crisis. U.S. banks appear to be just as well-capitalized and hold lower levels of investment and trading assets than European banks, but regulatory loopholes that allow U.S. banks to account for trillions of dollars of risky derivatives positions off-balance sheet render these comparisons less than fully meaningful.

The stock returns of both U.S. and European banks have remained significantly related to market and bank-level fundamentals in the years since the financial crisis. Modeling bank returns as a function of their profitability, growth and solvency explains 44% to 60% of the variation in U.S. and European bank stock prices, respectively.

This paper is organized as follows. Section 1 reviews the relevant literature. After which the data and empirical design are described in section 2. Section 3 depicts stock returns and revenue sources. Section 4 includes loan quality, trading assets, deposits and bank capital. Section 5 provides profitability, operational efficiency, tax rates and payouts to investors. Section 6 presents the analysis of bank stock returns. The final section presents the paper's conclusions.

## 1. Motivation and relevant literature

The academic literature conclusively determines that larger banks enjoy a competitive advantage, which explains why the banks featured in this study are often viewed as industry bellwethers. Filbeck et al. (2011) find that size plays a significant role in a bank's ability to outperform the S&P 500, particularly during an economic contraction. Filson and Olfati (2014) investigate banks that merge with or acquire other banks, as permitted under the Financial Services Modernization Act of 1999. These authors find that merger activity that leads to diversification into investment banking, securities brokerage and insurance activities create value for bank shareholders.

It is also the case that changes in the regulatory environment remain focused on the largest banks, as they contribute disproportionately to systemic risk. The Dodd-Frank Act designates bank holding companies with \$50 billion or more in consolidated assets as systemically significant (14 of the 20 U.S. banks and all 20 of the European banks in the sample meet this criterion, shown in Table 1). Accordingly, Dodd-Frank requires large financial firms to significantly increase their balance sheet capital, which can hamper banks' efforts to maximize profits (Price, Waterhouse, Coopers, 2010). Dodd-Frank also prohibits any mergers or acquisitions that result in a new entity whose consolidated liabilities exceed 10% of the aggregate liabilities of all financial companies (Murphy, 2010). The new capital requirements and merger restrictions are based on the risk these banks pose to stability of the U.S. financial system, which is determined mainly as a function of their size.

The Basel III Accord imposes even harsher restrictions on systemically important banks, requiring them to use more of their own capital in their operations (Basel Committee on Banking Supervision, 2010). These higher capital requirements are targeted at reducing both exposure to contagion and excessive risk-taking. Jackson et al. (1999), Santos (2001), Stolz (2002), and VanHoose (2006, 2007) find that higher capital standards lead to higher capital ratios, and also act as constraints that are likely to reduce total lending. Accordingly, banks' balance sheets reflect this substitution of alternative assets for loans. The shift to alternative assets is also being driven by global private sector deleveraging, which has further reduced the rate of loan growth (Keen, 2009).

The larger banks in both the U.S. and Europe are usually referred to as "Too Big to Fail" (TBTF) due to their systemic importance. Demircuc-Kunt and Huizinga (2010) find that the TBTF banks are more costly to bail out, and many believe that these banks exploit the moral hazard problem of regulators

being too quick to rush to their aid when they assume more risk than they can manage. For example, European banks have invested hundreds of billions of euros in the long-dated sovereign bonds of other European nations. Known as the “carry trade”, these investments are designed to profit from the spread between the low-cost short-term funding supported by the zero interest rate policies of the world’s major central banks and the higher yields of the bonds of economically-troubled nations such as Greece, Ireland, Portugal, Spain and Italy. The carry trade is essentially a bet that Eurozone countries will converge economically, resulting in a narrowing of the spread as the yields of sovereign bonds fall. The long-awaited economic convergence has not materialized, however, and as the spreads have widened further, European banks have actually increased their holdings of these risky positions (Acharya and Steffan, 2014). This massive carry trade exposure has most likely led to an increase in systemic risk, as it is essentially a network of over-leveraged nations holding each other’s bonds backed by nothing more than verbal assurance that they will not default. Correa, Lee, Sapriza and Suarez (2014) investigate this issue and confirm that the key factor allowing banks to maintain and expand exposure to these risky positions are the implied government guarantees backing these bonds.

Buttiglione, Lane, Reichlin and Reinhart (2014) study how the dynamics of debt accumulation influence macroeconomic conditions, essentially extending the “financial instability hypothesis” originally described by Fisher (1933) and further developed by Minsky (1977). The essence of their argument is that high debt levels increase vulnerability to the risk of a financial crisis (Gourinchas and Obstfeld, 2012; and Catão and Milesi-Ferretti, 2013). Deleveraging during the late stage of an economic contraction and the early phase of the ensuing economic recovery therefore contributes to macroeconomic stability. Buttiglione et al. (2014) reach several disturbing conclusions, however: “... the world has not begun to deliver and the global debt-to-GDP ratio is still growing” [p. 1], and “... the global capacity to take on [additional] debt has been reduced through the combination of slower expansion in real output and lower inflation” [p. 2]. Writing for the Center for European Policy Studies, Ayadi, Arbak and de Groen (2012) reach similar conclusions, finding that EU banks remain undercapitalized and excessively reliant on an unstable funding model, large derivative positions, and additional concentration among large banks that has decreased competition and increased systemic risk.

Baron and Xong (2014) also document an inverse relation between excessive debt accumulation and financial stability. These authors find that rapid

credit expansion is supported by over-optimism that causes investors to underprice “crash risk” in global equity markets. Their conclusions are consistent with the idea that the zero interest rate and quantitative easing policies of world central banks fuel instability via “financial repression”, which causes investors to chase risk and bid up the prices of riskier assets, thus reducing their future expected returns and compressing risk premia, with the risk of a stock market crash being one of the primary risks that is less than fully priced.

Schildback, Wenzel and Speyer (2013) describe the growth in revenues, profits and loans of banks in the U.S. and Europe as “an ocean apart” [p. 1]. These authors specifically cite the U.S. Federal Reserve’s faster regulatory response to the crisis and more aggressive intervention as factors promoting the superior recovery of U.S. banks. They describe the European banking regulatory framework as “patchwork” vs. that of the U.S., with these weaker regulations allowing Eurozone banks to write down only \$500 million of loans, while U.S. banks’ total writedowns have already exceeded \$1 trillion. Schildback et al. conclude that the lack of profitability of Eurozone banks is unsustainable, and that these banks are not yet close to earning their cost of capital. These factors have had a profoundly negative impact on the European economy because the role of banks in providing credit to the private and public sectors is more important in Europe, as the shadow banking system in the U.S. has provided an alternative source of credit vs. the traditional banking sector since the 1990s. These authors conclude that the U.S. is fundamentally different from Europe due to factors such as: an aggressive central bank with a much broader mandate than the ECB; the U.S. dollar is the global currency standard vs. the euro; world financial markets doubt the solvency of some European governments compared with the U.S. government; the U.S. has a more flexible labor market; and the U.S. economy is less dependent on weaker trading partners.

## 2. Data and descriptive statistics

Data for this study are obtained from Standard & Poor’s Capital IQ and the Federal Reserve Economic Database (FRED). The 20 largest commercial banks (in terms of market capitalization) as of year-end 2013 headquartered in Europe and the U.S. are identified from S&P’s Capital IQ. All European financial data are converted to U.S. dollars using historical currency rates for the relevant fiscal year.

The identity of the banks in the sample and descriptive statistics are presented as Tables 1 and 2. The median market capitalization of the U.S. banks is \$9.1 billion; they hold median assets of over \$64 billion, median total deposits of over \$51 billion, median total loans of over \$46 billion and employ over 571,000 people.



Table 1. Descriptive statistics, largest 20 U.S. commercial banks as of year-end 2013  
(values in millions, except total employees)

Bank	Market capitalization	Total assets	Total deposits	Total loans	Total employees
Wells Fargo & Company	\$267,220	\$1,598,874	\$1,118,577	\$815,841	264,900
U.S. Bancorp	\$76,032	\$389,065	\$276,262	\$239,742	65,565
PNC Financial	\$43,922	\$327,064	\$222,554	\$197,531	52,177
BB&T Corporation	\$26,639	\$188,012	\$131,586	\$117,933	33,700
SunTrust Banks, Inc.	\$20,275	\$182,559	\$133,285	\$127,741	26,281
Fifth Third Bancorp	\$17,295	\$132,562	\$95,952	\$89,026	19,446
M&T Bank Corporation	\$16,032	\$90,835	\$69,829	\$63,830	15,261
Regions Financial	\$13,983	\$118,719	\$93,822	\$75,284	24,255
KeyCorp.	\$11,872	\$91,798	\$67,799	\$54,786	14,783
CIT Group Inc.	\$9,117	\$44,153	\$13,939	\$18,263	3,240
Comerica Incorporated	\$9,088	\$65,325	\$54,170	\$47,291	8,886
Huntington Bancshares	\$8,023	\$63,797	\$48,749	\$45,445	11,964
First Republic Bank	\$6,446	\$46,229	\$35,034	\$36,094	2,388
Zions Bancorporation	\$5,838	\$55,111	\$45,671	\$38,954	10,452
Signature Bank	\$5,755	\$24,527	\$19,758	\$15,276	945
SVB Financial Group	\$5,527	\$33,309	\$28,353	\$11,228	1,704
Cullen/Frost Bankers, Inc.	\$4,910	\$24,313	\$20,689	\$9,423	3,979
East West Bancorp, Inc.	\$4,884	\$27,557	\$22,875	\$19,829	2,496
BOK Financial Corporation	\$4,588	\$27,844	\$20,572	\$13,236	4,632
Commerce Bancshares, Inc.	\$4,128	\$23,032	\$18,966	\$11,325	4,600
Total	\$561,575	\$3,554,685	\$2,538,442	\$2,048,079	571,654
Mean	\$28,079	\$177,734	\$126,922	\$102,404	28,583
Median	\$9,103	\$64,561	\$51,459	\$46,368	11,208
Minimum	\$4,128	\$23,032	\$13,939	\$9,423	\$945
Maximum	\$267,220	\$1,598,874	\$1,118,577	\$815,841	264,900

The greater concentration of banking activity in larger banks in Europe (often cited as the primary hurdle to reducing systemic risk) is reflected in their respective descriptive statistics. The median market capitalization of the European banks is five times

larger at \$52.7 billion; they hold median assets of over \$1 trillion, median total deposits and loans of almost \$500 billion and employ over 1.7 million people. Empirical findings are presented in the sections that follow.

Table 2. Descriptive statistics, largest 20 European commercial banks as of year-end 2013  
(values in millions, except total employees)

Bank	Market capitalization	Total assets	Total deposits	Total loans	Total employees
HSBC Holdings plc	\$119,652	\$2,758,447	\$1,455,526	\$1,139,360	254,066
Lloyds Banking Group plc	\$52,288	\$843,940	\$456,942	\$512,934	88,977
Banco Santander, S.A.	\$88,833	\$1,188,043	\$607,400	\$755,264	182,958
BNP Paribas SA	\$61,958	\$1,906,625	\$572,863	\$677,983	185,000
The Royal Bank of Scotland	\$39,955	\$1,011,000	\$440,000	\$414,000	118,600
Barclays PLC	\$36,815	\$1,314,899	\$505,805	\$485,997	139,600
Banco Bilbao Vizcaya	\$53,199	\$617,131	\$402,568	\$366,937	109,305
Standard Chartered PLC	\$30,115	\$674,380	\$435,497	\$344,901	86,640
Allied Irish Banks, p.l.c.	\$48,639	\$117,734	\$59,884	\$66,147	11,431
Nordea Bank AB (publ)	\$365,717	\$636,726	\$255,399	\$362,182	29,429
Societe Generale Group	\$28,834	\$1,265,800	\$315,800	\$345,900	148,324
UniCredit S.p.A.	\$33,898	\$841,623	\$515,418	\$557,910	147,864
Intesa Sanpaolo S.p.A.	\$36,826	\$625,133	\$250,063	\$324,672	93,845
Svenska Handelsbanken AB	\$208,366	\$2,680,291	\$1,017,665	\$1,843,550	11,503
Swedbank AB (publ)	\$191,402	\$2,051,743	\$668,968	\$1,347,532	14,706
DNB ASA	\$179,494	\$2,445,417	\$881,920	\$1,366,898	12,016
Skandinaviska Enskilda	\$198,087	\$2,653,784	\$1,082,318	\$1,405,710	15,693
Danske Bank A/S	\$159,076	\$3,273,485	\$1,109,206	\$1,602,270	19,122
KBC Group NV	\$16,809	\$246,179	\$151,784	\$136,164	36,177
Commerzbank AG	\$12,000	\$574,263	\$226,190	\$249,154	47,375

Table 2 (cont.). Descriptive statistics, largest 20 European commercial banks as of year-end 2013  
(values in millions, except total employees)

Bank	Market capitalization	Total assets	Total deposits	Total loans	Total employees
Total	\$1,961,964	\$27,726,643	\$11,411,216	\$14,305,465	1,752,631
Mean	\$98,098	\$1,386,332	\$570,561	\$715,273	87,632
Median	\$52,744	\$1,099,522	\$481,374	\$499,466	87,809
Minimum	\$12,000	\$117,734	\$59,884	\$66,147	11,431
Maximum	\$365,717	\$3,273,485	\$1,455,526	\$1,843,550	254,066

### 3. Stock returns and revenue sources

Figure 1 depicts the average cumulative stock returns for the sample of U.S. and European commercial banks vs. the S&P 500 index since the beginning of the most recent bull market (April 2009 to November 2014). The S&P 500 has risen 150% since 2009, vs. a mean total return to the sample of U.S. stocks of 232%. In contrast, the Euronext 100 index has increased only 65% since 2009, with an 80% mean return for the 20 largest European commercial banks over the same period.

The lower returns of the Euronext 100 and the European banks correspond to the continent's weaker economic conditions, as the Eurozone is teetering on the brink of its third recession in six years as of late 2014. It is important to note, however, that in both the U.S. and Europe the returns of the major commercial banks outperformed their home stock markets, suggesting that the financial sector in both regions was viewed more favorably by equity investors compared with other sectors over this period.

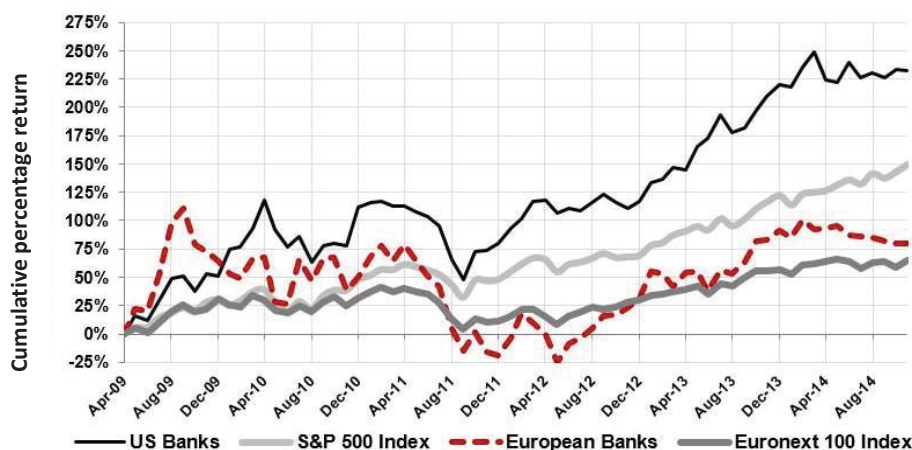


Fig. 1. U.S. and European bank stock returns, April 2009 to November 2014

Figure 2 depicts the cumulative growth in total revenues before loan losses for both sets of banks from 2010-2013 (the flurry of arranged mergers of weaker banks with stronger banks immediately following the financial crisis makes it difficult to measure organic revenue growth pre-2009). Surprisingly, the only year in which the aggregate total revenue of these banks increased significantly was 2013. From 2010-2012,

U.S. banks' revenue declined by 7.5% and European banks' revenue declined by 20%. By the end of 2013 U.S. banks' revenue had increased by 10%, but European banks' revenue remained 12% lower than in 2010. The higher rate of revenue growth of the U.S. banks partially accounts for their higher stock returns. Next I examine the traditional sources of revenue for both sets of banks.

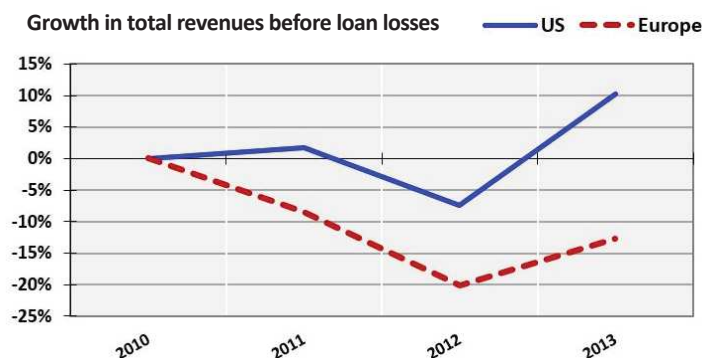


Fig. 2. Growth in total revenues before loan losses

Figure 3 presents the cumulative growth in total loans for both the U.S. and European banks from 2010-2013. The results are striking. U.S. banks grew the size of their loan portfolio every year, with total loans increasing a total of 35% over the 3-year

period. European banks, on the other hand, saw steady declines in total loans each year, with loans contracting by 10% over the same period. The more robust rate of loan growth for U.S. banks accounts for their superior revenue growth and stock returns.

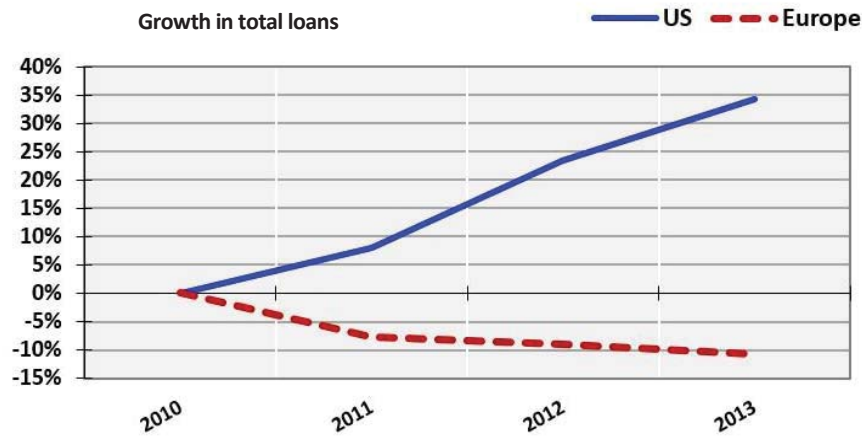


Fig. 3. Growth in total loans

I further investigate reasons for the differential rates of revenue growth by examining trends in mean net interest income from 2001-2013, expressed as a percentage of total revenue in Figure 4. The trend for U.S. banks is remarkably steady, confined in a tight range between 54%-60%. The financial crisis had little or no effect on interest income as a source

of revenue for U.S. banks. European banks' net interest income/revenue trends down pre-crisis, falling as low as 44% before rebounding sharply in 2008 and again trending slightly lower through 2013. U.S. and European banks have earned nearly identical percentages of their total revenues from interest income post-crisis.

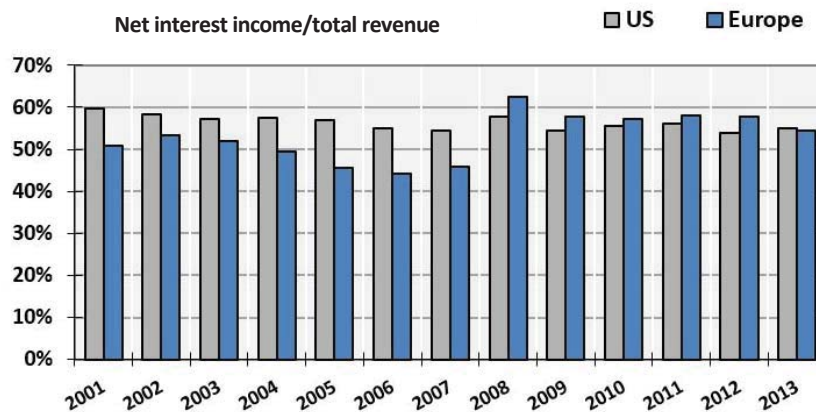


Fig. 4. Net interest income to total revenue

Summarizing the results of this section, I find that:

- ◆ The stock returns of U.S. commercial banks were substantially higher compared with European banks post-financial crisis (2009-2013). Both sets of banks outperformed their home stock market indexes.
- ◆ Large U.S. and European commercial banks have struggled to grow their total revenue post-crisis, as revenues declined for both sets of banks from 2010-2012. U.S. banks saw a 17% jump in revenues in 2013, while revenues increased only 8% in Europe.
- ◆ U.S. commercial banks increased the size of their loan portfolios every year from 2010-2013, with a 35% increase over the 3-year period. European commercial banks, on the other hand, saw the size of their loan portfolios contract each year, with total loans decreasing by 10% over the 2010-2013 period.
- ◆ U.S. banks earned a significantly higher percentage of their total revenues from interest income compared with European banks pre-financial crisis. European banks' interest income/revenue has increased post-crisis, while this ratio has remained constant for U.S. banks.

#### 4. Loan quality, trading assets, deposits and bank capital

In this section I examine the major asset categories and liability exposure of U.S. and European banks with the purpose of assessing the strength of banks' balance sheets pre- and post-financial crisis. Figure 5 depicts banks' major funding source, deposits, relative to total assets from 2001-2013. From 2001-2008, U.S.

banks' deposits/assets ratio was stable in a range between 62%-65%, after which the ratio gradually drifts higher, reaching 71% in 2012-2013. European banks' mean deposits/assets ratio displays an opposite trend, peaking at 58% in 2001 and gradually drifting lower through 2008, after which it remains stable in a range between 43%-47%. U.S. banks clearly prefer deposits as a funding source compared with European banks.

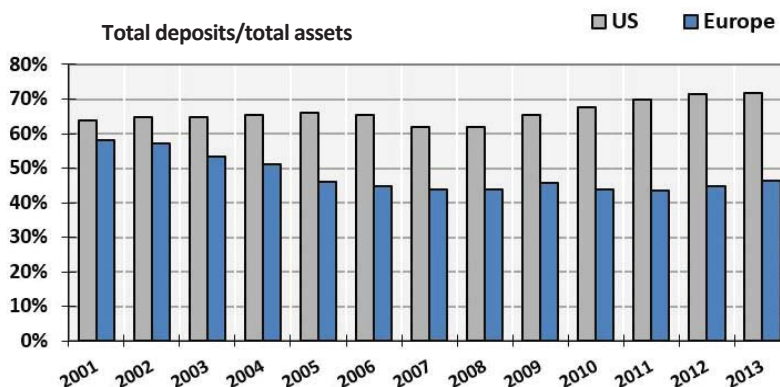


Fig. 5. Total deposits to total assets

Figure 6 depicts the mean ratio of total interest paid on deposits relative to all interest-bearing deposits for both sets of banks. European banks' interest/deposits ratio trends anti-cyclically, reaching lows of 5.9% in 2004 and 4.0% in 2013. U.S. banks' interest/deposits ratio displays a similar trend around significantly lower values, ranging between 1.5%-4.0% pre-financial crisis and trending lower every year post-

crisis. The ratio averaged an astoundingly low 0.28% in 2013. The results help explain why U.S. banks prefer deposits to other funding sources. The U.S. Federal Reserve has provided support for U.S. banks by maintaining its zero interest rate policy (ZIRP), which has allowed banks to increase their use of deposit-based funding while simultaneously lowering their overall cost of capital.

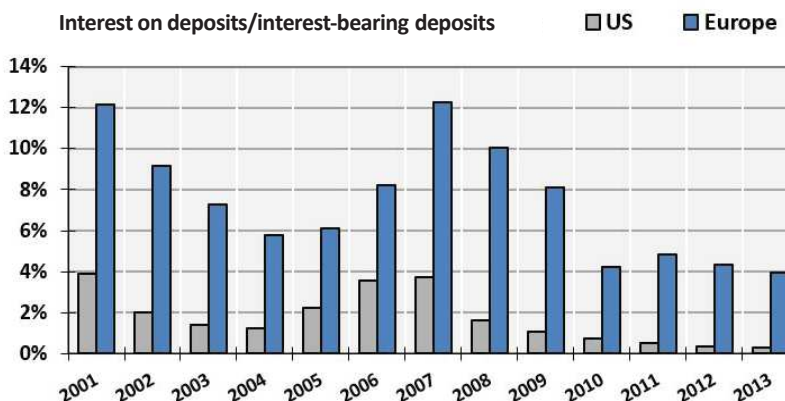


Fig. 6. Interest on deposits to interest-bearing deposits

Next I examine the major asset categories. Figure 7 depicts banks' mean ratio of investment securities plus trading assets to total assets from 2001-2013. The ratio for U.S. banks runs between 5%-6% pre-financial crisis, after which it trends upward to a high of 16% in 2013. The results make it appear as if European banks hold a much higher percentage of securities and trading assets: their mean value for this ratio is never lower than 26% (in 2003),

and averages between 35%-40% post-crisis. As banks in Europe have found it difficult to grow their loan portfolios (Figure 3), they have evidently substituted more investment securities and trading assets as a source of revenue. These findings are consistent with the predictions of researchers such as Van Hoose (2006, 2007) and Keen (2009) regarding banks holding more alternative assets and fewer loans.



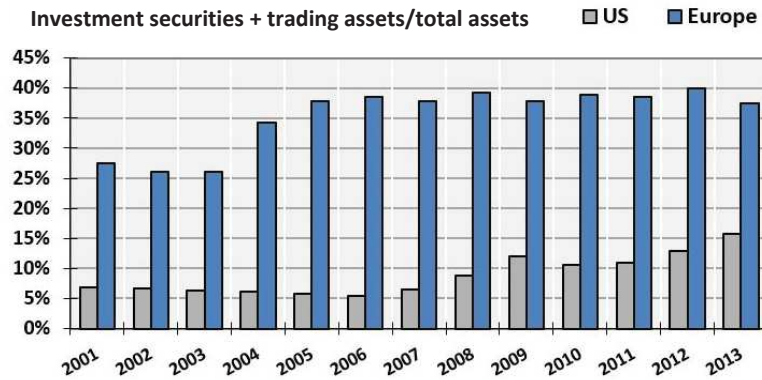


Fig. 7. Investment securities and trading assets to total assets

These results are not directly comparable between U.S. and European banks, however, as U.S. banks hold a far greater percentage of their derivatives positions and mortgage-backed securities off-balance sheet. This is permitted because U.S. banks are still following a combination of FASB and Basel I, II and III regulations after more than 7 years of stonewalling the long-anticipated changeover to International Accounting Standards and Basel III

that would force them to disclose (and hold capital against) these risky positions with full transparency. European banks, on the other hand, have been regulated under the Basel II accord for several years, and have already started the transition to the Basel III standards. U.S. banks therefore appear less risky based on this metric, but in reality their total derivatives exposure is probably far more risky (Onaran, 2013).

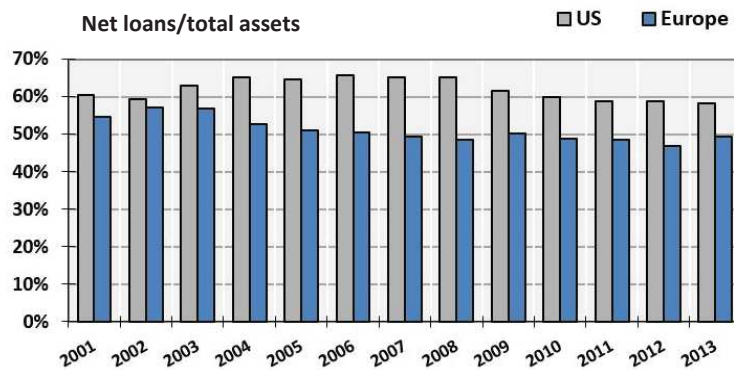


Fig. 8. Net loans to total assets

Figure 8 depicts banks' mean ratio of net loans/total assets from 2001-2013. The figure shows that as U.S. banks' investments in securities and trading assets increased post-financial crisis (Figure 9), the proportion of their assets invested in loans has gradually declined to a 12-year low of 58%. European banks have traditionally held lower ratios of loans/assets than U.S. banks, although they have

exhibited a similar downtrend in their mean loans/assets ratio post-crisis, and now hold approximately 50% of their assets in the form of loans. In the exhibits that follow I will investigate banks' relative safety and stability by examining the quality of their loan portfolios and the loan loss provisions and capital cushions these banks maintain as a buffer against potential loan losses.

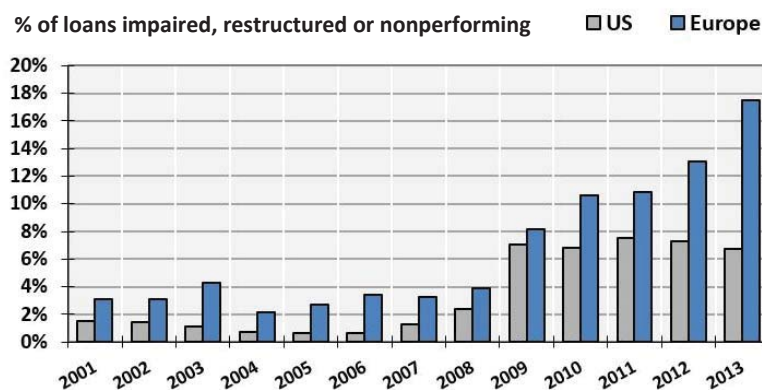


Fig. 9. Percentage of loans impaired, restructured or nonperforming

Figure 9 depicts the average percentage of banks' loans that are classified as impaired, restructured or nonperforming relative to total net loans. Considered together with the results presented in Figure 10, the findings that follow are somewhere between illuminating and disturbing. Pre-financial crisis, U.S. banks' impaired, restructured or nonperforming loans averaged between 0.5% to 1.8% of all loans. European banks ran consistently higher levels, ranging from 2.2% to 4.2%. U.S. banks saw a significant increase in their impaired loans following

the financial crisis, which have consistently averaged approximately 7% of U.S. banks' total loans since 2009 (more than 3 times their pre-crisis levels). European banks show an even more dramatic increase in impaired loans, jumping above 8% of all loans in 2009 and rising every year since, to almost 18% as of year-end 2013. While the quality of U.S. banks' loan portfolios remains compromised post-crisis, Europe's loan portfolio quality continues deteriorating every year, with 2013 representing the worst year since the financial crisis.

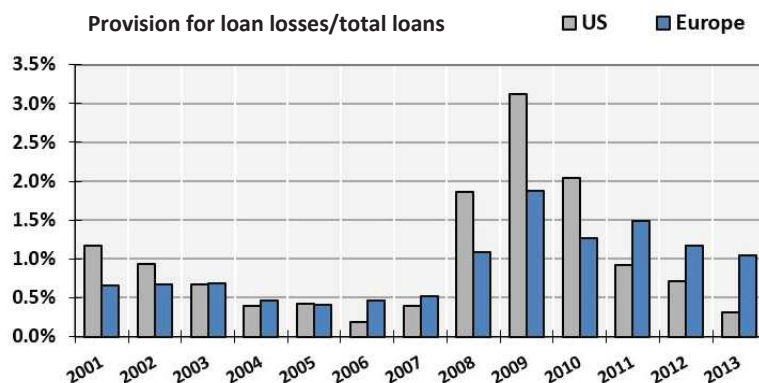


Fig. 10. Provision for loan losses to total loans

Figure 10 depicts banks' mean ratio of provision for loan losses to total loans from 2001-2013. Loan loss provisions are transferred out of the allowance for loan losses account on the balance sheet and expensed against bank profits at the discretion of the financial manager, usually in anticipation of loan defaults. The effect of the financial crisis can be seen in the graph, as loan loss provisions for both U.S. and European banks increase significantly in

2008 and 2009. Both sets of banks gradually reduce their provisions beginning in 2010, with U.S. banks once again recording provisions at pre-crisis levels. Although European banks continue to provision for a much larger percentage of their total loans than U.S. banks, both sets of banks are steadily *reducing* provisions, even though the quality of U.S. banks' loan portfolios has not improved, and European bank loan quality continues to *worsen*.

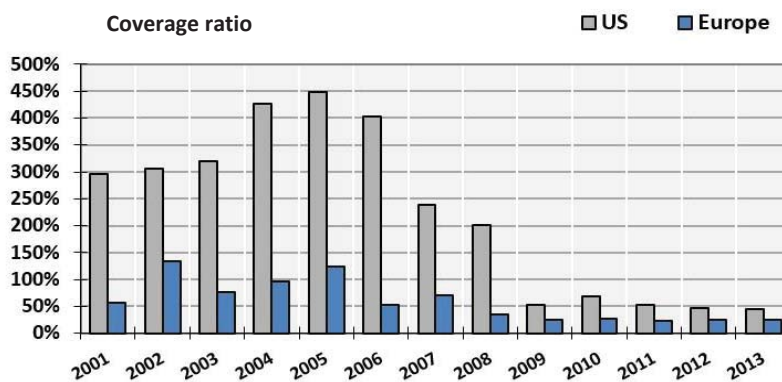


Fig. 11. Coverage ratio (allowance for loan losses/impaired loans)

Figure 11 depicts banks' coverage ratios, calculated as their allowance for loan losses relative to all impaired loans. The allowance account represents the "rainy day" fund banks establish on the balance sheet in case these funds must be transferred to the income statement in the event of loan defaults. The graph shows that, despite *higher* levels of impaired, restructured and nonperforming loans post-crisis (Figure 9), both U.S. and European banks have set aside a

significantly *lower* percentage of liquid assets in anticipation of loan defaults. The most striking result from Figure 11 is that since 2009 banks' allowance accounts relative to impaired loans have been maintained at significantly lower levels than they were pre-crisis. Even though their balance sheets remain ridden with impaired loans, they are setting aside fewer resources to deal with potential loan losses, which allows them to report significantly higher profits.

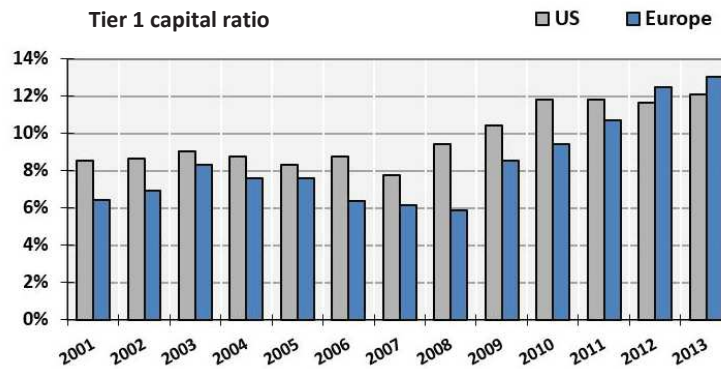


Fig. 12. Tier 1 capital ratio

The Collins Amendment to the Dodd-Frank act requires banks to significantly increase balance sheet capital, particularly Tier 1 capital holdings. Holding more capital contributes to two opposing effects, however, thus the overall effect of a higher capital ratio is ambiguous (Keeley, 1990; Demsetz et al., 1996; and Hellman et al., 2000). Higher capital ratios discipline banks' risk-taking, as using more of their own capital exposes banks to greater risk. Holding more capital may also decrease stability, however, because it is costly to banks. Future profits may therefore be lower, resulting in banks being forced to increase their risk exposure to grow profits. Recent bank crises have increased regulator and shareholder awareness of the importance of adequate capital buffers, with many banks maintaining levels of capital greater than the regulatory minimum as a cushion against the adverse financial consequences of unexpected changes in asset prices. Banks therefore have an incentive to hold excess capital to avoid the costs associated with supervisory action if they approach or fall below the regulatory minimum capital ratio (Marcus, 1984; and Furfine, 2001). Banks may also maintain excess capital as a signal of stability to the market and to satisfy regulators and rating agencies (Jackson et al., 1999; and Shim, 2013). Unfortunately, the numerous Eurozone "stress tests" of banks' capital adequacy employ constantly-shifting capital targets to make stress test results appear better than they otherwise would (Riecher and Black, 2014).

Figure 12 depicts the mean Tier 1 capital ratio from 2001-2013. Both sets of banks' mean Tier 1 ratios rose steadily following the financial crisis, with European banks finally exceeding the percentage of Tier 1 capital held by U.S. banks in 2012-2013. With ratios of 12% and 13%, respectively, both sets of banks appear to be well above the Basel III regulatory minimum of 4%. It is important to remember that the ratio scales Tier 1 capital by the banks' total risk-based assets carried *on-balance sheet*, however – if banks were required to hold more of their derivative positions on their balance sheets, the apparent cushion of safety would shrink considerably (Kretschmar, McNeil and Kirchner, 2010).

- ◆ U.S. banks prefer deposits as a source of funding compared with European banks. U.S. banks' deposits/assets ratio has drifted upwards to 71% by 2013, while European banks funded less than 50% of their assets via deposits post-financial crisis.
- ◆ The rate of interest paid on deposits by U.S. and European banks has fallen consistently post-crisis, but U.S. banks pay far lower rates. European banks paid an average of 4.0% on deposits in 2013, while U.S. banks paid only 0.28%, which helps explain their preference for deposits as a source of funding.
- ◆ European banks held 35%-40% of their assets in the form of investment securities and trading assets, while U.S. banks' ratio was far lower, only 16% after years of trending higher. These results are not directly comparable, however, due to regulatory loopholes that allow banks in the U.S. to hold most of their derivative positions off-balance sheet.
- ◆ U.S. and European banks exhibit similar downtrends in their loans/assets ratio post-crisis. U.S. banks held an average of 58% of their assets in the form of loans, compared with less than 50% for European banks.
- ◆ The mean percentage of impaired, restructured or nonperforming loans has soared post-crisis for both sets of banks. The ratio has leveled off at slightly less than 7% in the U.S., but has climbed every year in Europe, reaching a record 18% in 2013.
- ◆ Despite record levels of impaired and nonperforming loans, banks in both the U.S. and Europe have reduced their provision for loan losses every year post-crisis. Coverage ratios (loan loss allowance/impaired loans) for both sets of banks also remain at historic lows post-crisis.
- ◆ Both sets of banks hold more Tier 1 capital than required by the Basel III accord, although moving risky derivative positions back onto bank balance sheets in the U.S. would change these results significantly, and leave U.S. banks undercapitalized.

## 5. Profitability, operational efficiency, tax rates and payouts to investors

In this section I examine the profitability, operational efficiency, effective tax rates and payouts to investors from 2001-2013. Figure 13 depicts the trend in banks' mean net profit margin. Pre-crisis U.S. banks' profit margin rose steadily until peaking at 28% in 2006, while European banks' net margin peaked in 2007 at 32%. Net margin for both sets

of banks plummets during the financial crisis and takes years to recover. U.S. banks grew their profit margin every year since 2008, rebounding from a low of 8% all the way to 27% in 2013. European banks' mean profit margin initially rebounded, but has trended back down to a post-crisis low of 7% in 2013. The vast difference between U.S. and European banks' ability to generate profits helps explain U.S. banks' superior stock returns since 2009.

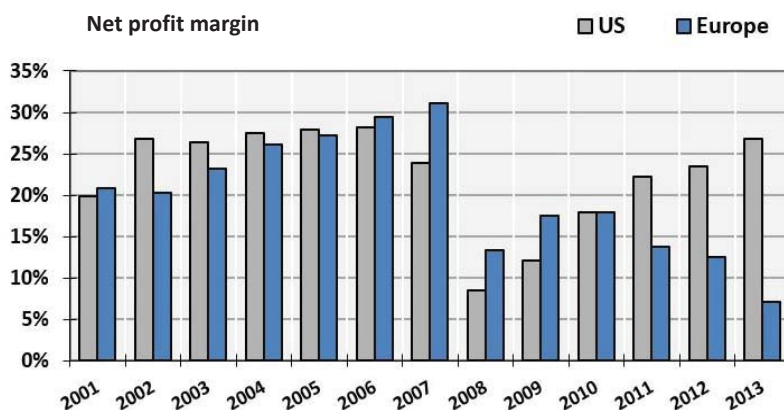


Fig. 13. Net profit margin

Figure 14 depicts mean return on equity (ROE) for both sets of banks. European banks' ROE was consistently higher than that of U.S. banks pre-crisis, ranging between 12%-17% from 2001-2007. U.S. banks' ROE never exceeded 13% over the same period. During the crisis U.S. banks' ROE rose steadily, however, peaking at 16% in 2010 before edging back down to 14% in the following years. The

mean ROE for U.S. banks is now 2% higher than it was pre-crisis. By way of contrast, European banks' ROE has been in a steady downtrend post-crisis, plummeting to 2.5% in 2013. The profound lack of profitability among Europe's 20 largest commercial banks and the deteriorating trend in ROE is sending a strong warning signal regarding the stability of banks – and thus the climate for business – in the Eurozone.

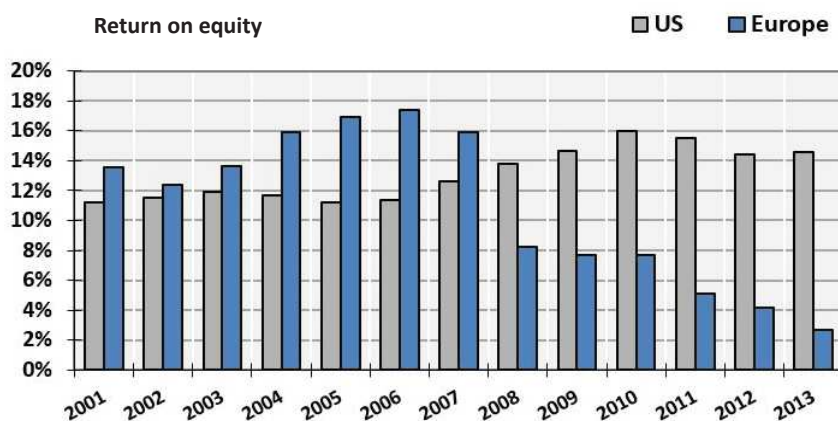


Fig. 14. Return on equity

Figure 15 depicts one of the prime drivers of profitability for banks, the mean earning asset yield (interest income/earning assets) from 2001-2013. Despite paying much lower rates on deposits compared with Europe (Figure 8), U.S. banks have consistently generated much higher returns from their earning assets. U.S. banks'

2013 earning asset yield of 3.9% in 2013 was significantly better than Europe's 2.2%, although ZIRP has squeezed this metric lower for both sets of banks post-crisis. The combination of a higher earning asset yield and lower rates on deposits accounts for much of U.S. banks' superior profitability.



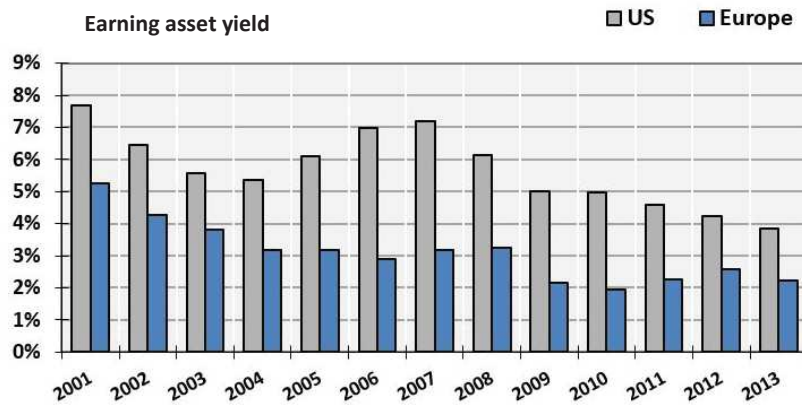


Fig. 15. Earning asset yield (total interest income/total earning assets)

Figure 16 depicts banks' mean efficiency ratio, calculated as total non-interest expense divided by total revenue, which is often used as a measure of banks' operational efficiency. Both U.S. and European banks both see increases in this ratio post-

crisis, although U.S. banks' mean value of 57% is superior to that of European banks, which increased significantly in 2012-2013. These increases most likely reflect banks' efforts to adapt to the new regulatory frameworks imposed on them post-crisis.

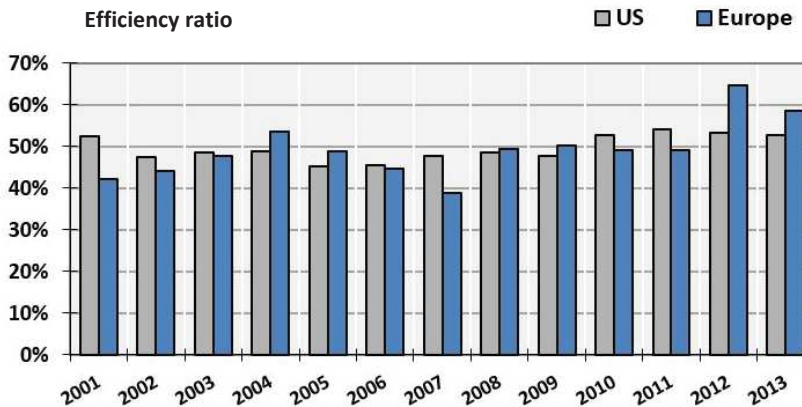


Fig. 16. Efficiency ratio

Figure 17 depicts banks' mean effective tax rate from 2001-2013. Both sets of banks are paying lower average tax rates post-crisis, although U.S. banks pay higher rates (30%) than European banks, which have enjoyed an average tax rate of 20% since

2009. Despite higher revenues and profits, U.S. banks are paying lower effective tax rates, which represent another post-crisis perk for their bottom lines. Banks have been allowed to book more of their revenue as profit due to lower tax rates.

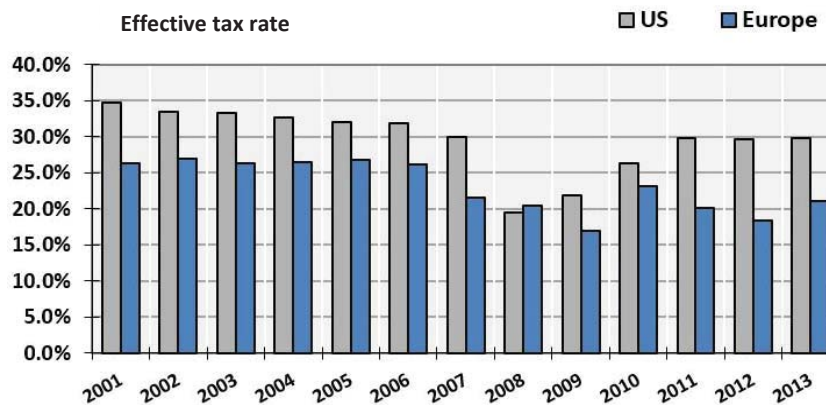


Fig. 17. Effective tax rate

Figure 18 depicts bank' payout ratio, which I have calculated in an unorthodox manner due to extremely volatile bank profits around the financial crisis. In the exhibits that follow I express banks' dividends relative to total revenue rather than net income to avoid examining an overly noisy data series. Figure 18 shows that bank dividends relative to revenues were in a rising trend pre-crisis, reaching highs of 13.5% for U.S. banks and 15.1% for European banks in 2007. Post crisis, banks have reduced their dividend payout dramatically (more so in the U.S. than Europe), and as of 2013 banks' mean

dividend/revenue ratio stood at 6.5% for U.S. banks and 8.0% for European banks. Given Europe's deeply troubled profitability picture, it is understandable that their dividend payouts have not been restored to pre-crisis levels. Lower payout ratios post-crisis reflect the need to raise additional capital, with retaining earnings being one of the most direct methods for accomplishing this. U.S. banks do not enjoy a similar excuse, however. U.S. banks' reluctance to increase dividends may be signaling a lack of confidence over the sustainability of recent increases in profits.

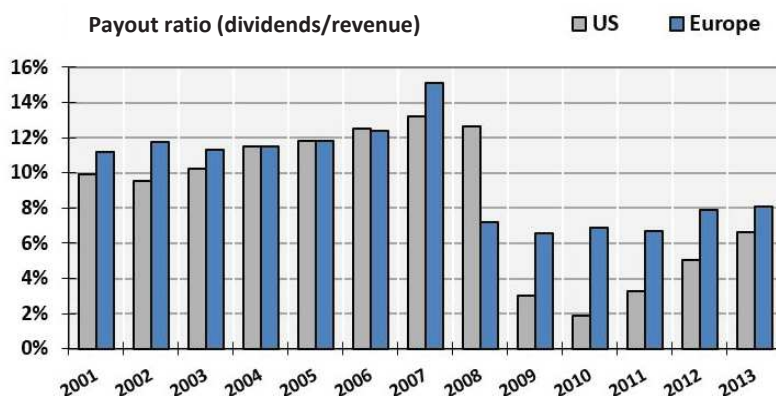


Fig. 18. Ratio of dividends to total revenue

Figure 19 depicts banks' dividend yield (dividend/price) from 2001-2013. U.S. banks' dividend yield is stable in a range between 2.6%-3.2% pre-crisis, and rises during 2007-2008 as bank stock prices fall faster than dividends. The large reduction in dividends that

begins in 2009 takes the average U.S. yield below 1.0% in 2010, after which it climbs to 2.1% in 2013, well below its pre-crisis average. European banks dividend yield shows a similar but less severe pattern, settling at 3.0% by the end of 2013.

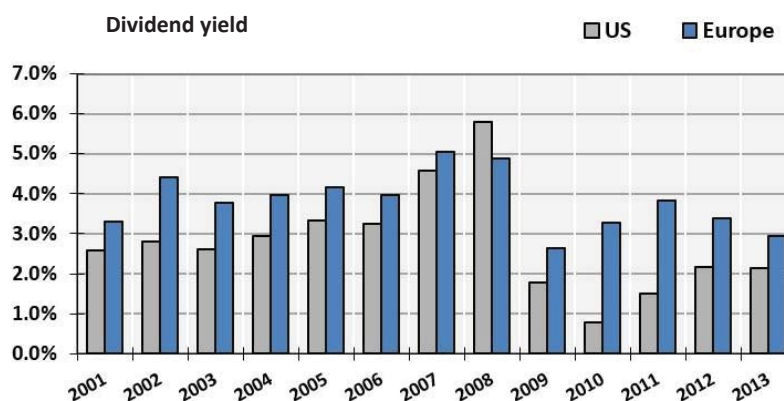


Fig. 19. Dividend yield

The final metric considered assesses banks' total leverage. The ratio of a bank's market capitalization to all debts plus capital leases is a component of Moody's (2011) Expected Default Frequency (EDF<sup>TM</sup>) calculation. In general, the higher the ratio of value to debt, the lower the probability of default. The deteriorating financial position of European vs. U.S. banks in the pre-crisis period is evident in Figure 20. European banks' value/debt ratio displays a long-term decline to less than 15% in 2008, and rises moderately back to 35% as of year-end 2013. As

much as any other metric, the mean value/debt ratio depicts European banks' precarious slide closer to insolvency, as these banks still owe almost 3 times more to creditors than the market value of their stock. U.S. banks' mean value/debt ratio tells a completely different story. The ratio achieves a low of only 40% in 2008, and climbs every year thereafter, averaging almost 150% in 2013, which is higher than any pre-crisis value. The ratio suggests a complete return to financial health for U.S. banks, and offers little reason for continued coddling by the banker-centric U.S. Federal Reserve.

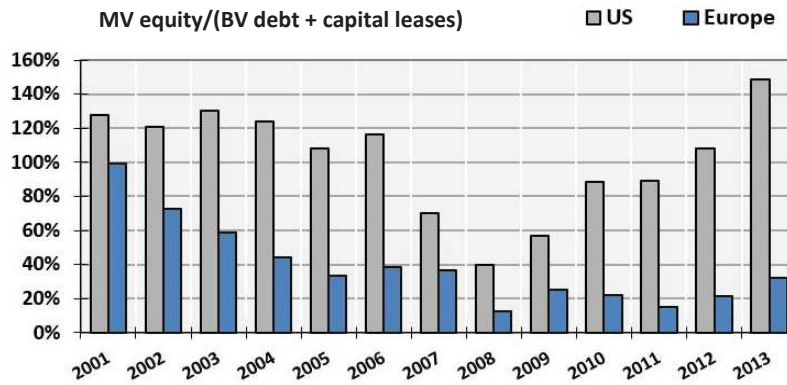


Fig. 20. Ratio of market value of equity to debt plus capital leases

Summarizing the results of this section, I find that:

- ◆ Both sets of banks experienced profound declines in their net profit margins and return on equity during the financial crisis. U.S. banks' net margin and ROE have rebounded to their pre-crisis levels (27% and 32%, respectively), but European banks' net margin of 7% and ROE of 2.5% are indicative of continued instability in the Eurozone.
- ◆ Central banks' zero interest rate policy has squeezed banks' earning asset yield lower over time, but U.S. banks earn a consistently higher average rate on their assets compared with European banks (3.9% vs. 2.2% as of year-end 2013).
- ◆ U.S. banks' efficiency ratio (non-interest expense/revenue) is also superior to that of European banks. Both sets of banks have seen operating expenses rise, most likely as a result of increases in regulatory requirements post-financial crisis.
- ◆ U.S. banks pay a higher effective tax rate than European banks, although both sets of banks are paying lower rates in the post-financial crisis world, despite U.S. banks' return to pre-crisis profitability.
- ◆ European banks have higher dividend payout ratios than U.S. banks and higher dividend yields, despite their lower profitability.
- ◆ U.S. banks' market value/debt ratio recovered to an all-time high of 150% by year-end 2013, while European banks' ratio of 35% suggests impending insolvency in the Eurozone banking system.

## 6. Analysis of bank stock returns

In this section I analyze the determinants of bank stock returns post-financial crisis (2009-2013) to determine if bank returns have remained significantly related to market and company-level fundamentals, given the unprecedented amount of central bank intervention and support with which they have been provided. Beccalli, Casu and Girardone (2006) find that improved operating efficiency boosts bank stock returns, and Yang and Tsatsaronis (2012) show how systematic risk

exposure varies with the business cycle. I therefore model bank returns as a function of bank-level fundamentals including profitability (return on equity or net profit margin), earning power (earning asset yield), solvency (ratio of market value/debt), and either dividend yield (U.S. banks) or revenue growth (Eurozone banks), depending on which variable is most significant in explaining the returns of each sample of banks. Control variables included in the models are the home market stock index return (S&P 500 or Euronext 100), relevant interest rate (yield on the 10-year Treasury note and yield on 10-year LIBOR), and the natural logarithm of each bank's market capitalization.

I estimate the model for bank stock returns using a panel data approach. Panel data models follow the general form:

$$y_{it} = x'_{it}\beta + z'_i\alpha + \varepsilon_{it},$$

with  $z'_i\alpha$  representing the heterogeneous or individual effects that are generally time-invariant. The vector  $z_i$  contains a constant term and a set of individual or group-specific variables which may be unobserved (such as managerial skill or different business practices across banks), but are correlated with one or more regressors (such as bank profitability). The panel is balanced (each individual in the dataset is observed the same number of times) and fixed (the same set of entities is observed for the duration of the study). Fixed effects models control for time-invariant differences between entities, allowing estimation of  $\alpha$  as a group-specific constant term. Random effects panel data models assume that entity-specific characteristics are random and uncorrelated with the other explanatory variables.

The Hausman test (which is essentially a chi-square statistic) can be used to specify whether a fixed or random effects treatment provides a better fit for the data. A  $p$ -value greater than 0.05 rejects the null hypothesis of the presence of random effects. For both sets of banks, the Hausman test indicates that the data should be modeled using a fixed effects approach.

Table 3. Analysis of U.S. bank stock returns

The model is estimated with quarterly stock returns and financial statement data from 2009-2013 using a fixed-effects panel data model. t-statistics for variables significant at the 5% level or lower are indicated with an asterisk.

Variable	Coefficient	Std. error	t-statistic	p-value
CONSTANT	0.0006	0.0858	0.0067	0.9947
MARKET RETURN	0.2502	0.0870	2.8761*	0.0044
INTEREST RATE	0.0989	0.0434	2.2802*	0.0236
LN MKTCAP	0.0141	0.0084	1.6676	0.0969
RETURN ON EQUITY	0.7223	0.2004	3.6050*	0.0004
EARNING ASSET YIELD	-1.2965	0.7844	-1.6528	0.0998
MARKET VALUE/DEBT	0.0265	0.0081	3.2555*	0.0013
DIVIDEND YIELD	-4.5438	0.8090	-5.6162*	0.0000
R-squared	50.5%			
Adjusted R-squared	44.4%			
S.E. of regression	0.2131			
F-statistic	8.3587			
Prob (F-statistic)	0.00			

Table 3 presents the results for the sample of U.S. banks. I find that U.S. bank stock returns are positively related to firm profitability (ROE) and the ratio of market value/debt, and negatively related to dividend yield. Banks' earning asset yield is insignificant in the regression, as is the market capitalization control variable. The adjusted R-squared of 44% shows that the model fits the data well. (Other variables that were fit in the regression but insignificant include revenue growth and net profit margin).

Table 4. Analysis of European bank stock returns

The model is estimated with quarterly stock returns and financial statement data from 2009-2013 using a fixed-effects panel data model. t-statistics for variables significant at the 5% level or lower are indicated with an asterisk.

Variable	Coefficient	Std. error	t-statistic	p-value
CONSTANT	-0.6948	0.4498	-1.5448	0.1239
MARKET RETURN	1.3000	0.0940	13.8254*	0.0000
INTEREST RATE	-0.1183	0.0363	-3.2564*	0.0013
LN MKTCAP	0.0590	0.0438	1.3463	0.1796
PROFIT MARGIN	-0.1503	0.0957	-1.5711	0.1177
EARNING ASSET YIELD	2.9277	1.1744	2.4930*	0.0134
MARKET VALUE/DEBT	0.3567	0.0775	4.6022*	0.0000
REVENUE GROWTH	0.3468	0.0738	4.7001*	0.0000
R-squared	66.8%			
Adjusted R-squared	62.8%			
S.E. of regression	0.3149			
F-statistic	16.519			
Prob (F-statistic)	0.00			

Table 4 presents the results for the sample of European banks. In Europe, bank stock returns were related to earning asset yield and the market value/debt ratio, although direct measures of profitability such as net profit margin were insignificant (as was ROE). European banks with higher revenue growth also had significantly higher returns. The market capitalization and interest rate

variables are also significant, and as was the case for U.S. banks, the natural log of market capitalization was insignificant. The adjusted R-squared of 67% shows that the model provides a good fit for the data.

Overall, these findings indicate that bank stock returns in both the U.S. and Europe were significantly related to firm-level fundamentals after controlling for home stock market returns, interest rates and bank size. Moreover, the explanatory power of the models is stronger than the 25% R-squareds reported by previous researchers such as Baele, Bruyckere, De Jonghe and Vander Venet (2013). The results contradict the notion that bank stocks rise and fall solely based on central bank posturing, and that bank fundamentals continue to matter to a significant degree.

### Summary and conclusions

In this paper I compare the financial performance, growth, asset mix, risk, operational efficiency, profitability and capital holdings of the 20 largest commercial banks in the U.S. and Europe from 2001-2013. I focus on the largest 20 commercial banks because the global economy depends on the financial health of these banking giants and their ability to supply credit, as well as the fact that they are most likely to have the resources to adapt quickly to the new regulatory framework mandated by the Dodd-Frank act and Basel III accord. Moreover, these banks receive a disproportionate amount of regulatory scrutiny, because banks of this size and scope are the dominant players in their industry and are most important systemically. I also investigate whether the stock returns of these banks have remained significantly related to business and market fundamentals (such as profitability and interest rates) since the turn of the century, given the aggressive central bank and government intervention that has been in place since the 2008 financial crisis.

I find that U.S. banks earned significantly larger stock returns than their European counterparts in the post-crisis years. Moreover, these returns are justified based on U.S. banks' higher rates of revenue and loan growth, lower risk, and superior profitability and loan portfolio quality. European banks, on the other hand, remain trapped in a downward spiral of negative revenue and loan growth, decreasing profitability, rising rates of impaired and nonperforming loans, and are dangerously close to insolvency based on their market value to debt ratio.

While U.S. banks have largely recovered from the financial crisis, the loan loss allowances carried on their balance sheets are significantly lower than they were pre-crisis, even though the percentage of impaired or nonperforming loans remains elevated. This is a difficult finding to explain, other than it



reconciles with other operational advantages U.S. banks are enjoying post-crisis. These include paying smaller dividends to investors and lower interest to depositors compared with Eurozone banks, and paying an average effective tax rate that is a full 5% lower than they paid pre-crisis. U.S. banks appear to be just as well-capitalized and hold lower levels of investment and trading assets as European banks, but regulatory loopholes that allow U.S. banks to account for trillions of dollars of risky derivatives positions off-balance sheet render these comparisons less than fully meaningful.

The stock returns of both U.S. and European banks have remained significantly related to market and bank-level fundamentals in the years since the financial crisis. Modeling bank returns as a function of their profitability, growth and solvency explains 44% to 60% of the variation in U.S. and European bank stock prices, respectively. Overall, the results strongly indicate that U.S. banks are ready to compete in global markets without excessive regulatory interference, but European banks are likely to remain closely supported and regulated for an appreciable time.

## References

1. Acharya, V.V. and Steffen, S. (2014). The “Greatest” Carry Trade Ever? Understanding Eurozone Bank Risks, *Journal of Financial Economics*, forthcoming (2014).
2. Ayadi, R., Arbak, E., and W. Pieter de Groen (2012). Regulation of European Banks and Business Models: Towards a New Paradigm? Center for European Policy Studies, Brussels (2012).
3. Baele, L., Bruyckere, V., De Jonghe, O. and Vander Venet, R. (2013). Model Uncertainty and Systematic Risk in U.S. Banking, Working paper, January 10. Available at: SSRN: <http://ssrn.com/abstract=2216563>.
4. Baron, M. and Xong, W. (2014). Credit Expansion and Neglected Crash Risk, Working paper, Princeton University (2014), available at: <http://www.princeton.edu/~mdbaron/CreditExpansion.pdf>.
5. Basel Committee on Banking Supervision. “Basel III: A Global Regulatory Framework for More Resilient Banks and Banking Systems” (2010).
6. Beccalli, E., Casu, B. and Girardone, C. (2006). Efficiency and Stock Performance in European Banking, *Journal of Business Finance and Accounting*, 33, pp. 245-262.
7. Black, J., Sirlletti, S. and Moshinsky, B. (2014). ECB Said to Favor Six Percent Capital Requirement in Stress Test, *Bloomberg Businessweek* (January 14). Available at: <http://www.businessweek.com/news/2014-01-15/ecb-said-to-favor-6-percent-capital-requirement-in-stress-test-of-banks> (accessed July 14, 2014).
8. Buch, C. and Neugebauer, K. (2011). Bank-Specific Shocks and the Real Economy, *Journal of Banking and Finance*, 35, pp. 2179-2187.
9. Buttiglione, L., Lane, P., Reichlin, L. and Reinhart, V. (2014). Deleveraging? What Deleveraging? Geneva Reports on the World Economy 16, International Center for Monetary and Banking Studies (2014).
10. Catão, L. and G.M. Milesi-Ferretti (2013). External Liabilities and Crises, IMF Working Paper No. 13/113.
11. Coppola, F. (2014). Austria Falls Out with Bavaria over Zombie Banks, *Forbes Magazine*, available at: <http://www.forbes.com/sites/francescoppola/2014/06/28/austria-and-bavaria-a-tale-of-zombie-banks/>, June 28, (accessed July 28, 2014).
12. Correa, R., Lee, K., Sapriza, H. and Suarez, G. (2014). Sovereign Credit Risk, Banks’ Government Support, and Bank Stock Returns Around the World, *Journal of Money, Credit and Banking*, 46, pp. 93-121.
13. Demirguc-Kunt, A., Huizinga, H. (2010). Are Banks Too Big to Fail or Too Big to Save? International Evidence from Equity Prices and CDS Spreads, *CEPR Discussion Papers*, Center for Economic Policy Research.
14. Demsetz, R.S., Saindenberg, M.R., Strahan, P.E. (1996). Banks with Something to Lose: The Disciplinary Role of Franchise Value, *FRBNY Economic Policy Review*, 2, pp. 1-14.
15. EDF Overview (2013). Moody’s Analytics. Available at: <http://www.moodyanalytics.com/~media/Brochures/Credit-Research-Risk-Measurement/Quantative-Insight/CreditEdge/EDF-Expected-Default-Frequency-Overview.ashx> (accessed September 21, 2014).
16. Enrich, D., Strasburg, J. and Henning, E. (2014). Deutsche Bank Suffers From a Litany of Reporting Problems, Regulators Said, *The Wall Street Journal* (July 22). Available at: <http://online.wsj.com/articles/deutsche-bank-suffers-from-litany-of-reporting-problems-regulators-said-1406058151> (accessed July 22, 2014).
17. Filbeck, G., Preece, D. and Zhao, X. (2011). Top Performing Banks: Size Effect and Economic Cycles, *Journal of Investing*, 20, pp. 19-32.
18. Filson, D. and S. Olfati (2014). The Impacts of Gramm-Leach-Bliley Bank Diversification on Value and Risk, *Journal of Banking and Finance*, 41, pp. 209-221.
19. Fisher, Irving (1933). The debt-deflation theory of great depressions, *Econometrica*, 1, pp. 337-357.
20. Furfine, C. (2001). Bank Portfolio Allocation: The Impact of Capital Requirements, Regulatory Monitoring and Economic Conditions, *Journal of Financial Services Research*, 20, pp. 33-56.
21. Gerken, A., Guse, F., Heuser, M., Monguzzi, D., Plantefevé, O. and Poppensieker, T. (2013). Between Deluge and Drought: The Divided Future of European Bank-Funding Markets, *McKinsey Working Papers on Risk*, No. 41 (March).
22. Goss, A. and Roberts, G. (2011). The Impact of Corporate Social Responsibility on the Cost of Bank Loans, *Journal of Banking and Finance*, 35, pp. 1794-1810.
23. Gourinchas, P.O. and M. Obstfeld (2013). Stories of the Twentieth Century for the Twenty-First, *American Economic Journal: Macroeconomics*, 4, pp. 226-265.

24. Hellman, T., Mudock, K., Stiglitz, J.E. (2000). Liberalization, Moral Hazard in Banking and Prudential Regulation: Are Capital Controls Enough? *American Economic Review*, 90, 1, pp. 147-165.
25. Jackson, P., Furfine, C., Groeneveld, H., Hancock, D., Jones, D., Perraudin, W., Radecki, L., and Yoneyama, M. (1999). Capital Requirements and Bank Behavior: The Impact of the Basel Accord, *Basel Committee on Banking Supervision*, Working Paper No. 1 (April).
26. Kanas, A. (2003). Bank Dividends, Risk and Regulatory Regimes, *Journal of Banking and Finance*, 1 (37), pp. 1-10.
27. Keeley, M.C. (1990). Deposit Insurance, Risk and Market Power in Banking, *American Economic Review*, 80, pp. 1183-1200.
28. Keen, S. (2009). The Global Financial Crisis, Credit Crunches and Deleveraging, *Journal of Australian Political Economy*, 64, pp. 18-32.
29. Kretzschmar, G., McNeil, A. and Kirchner, A. (2010). Integrated Models of Capital Adequacy – Why Banks are Undercapitalized, *Journal of Banking and Finance*, 34, pp. 2838-2850.
30. Marcus, A. (1984). Deregulation and Bank Financial Policy, *Journal of Banking and Finance*, 8, pp. 557-565.
31. Minsky, Hyman (1977). The Financial Instability Hypothesis: An Interpretation of Keynes and an Alternative to “Standard” Theory, *Nebraska Journal of Economics and Business*, 16, pp. 5-16.
32. Murphy, M. (2010). The Dodd-Frank Wall Street Reform and Consumer Protection Act: Titles III and VI, Regulation of Depository institutions and Depository Institution Holding Companies, *Congressional Research Service Report for Congress* (July 2010).
33. Onaran, Y. (2014). U.S. Banks Bigger Than GDP as Accounting Rift Masks Risks, Bloomberg.com, February 20, 2013, available at: <http://www.bloomberg.com/news/2013-02-20/u-s-banks-bigger-than-gdp-as-accounting-rift-masks-risk.html> (accessed September 21, 2014).
34. Oprita, A. (2010). Extra Bank Capital Means Global Recession: Bove, CNBC.com, June 27, 2010. Available at: <http://www.cnbc.com/id/43377170> (accessed June 27, 2011).
35. Price, Waterhouse, Coopers (2010). Impact On Banks, Thrifts, and Their Holding Companies, in the *A Closer Look at the Dodd-Frank Wall Street Reform and Consumer Protection Act* series, August 2010.
36. Riecher, S. and Black, J. (2013). ECB Capital Definition Tougher in Stress Test Than Review, Bloomberg.com (October 23, 2013): <http://www.bloomberg.com/news/2013-10-23/ecb-applies-8-capital-buffer-to-124-banks-in-asset-test.html> (accessed July 14, 2014).
37. Santos, J. (2001). Bank Capital Regulation in Contemporary Banking Theory: A Review of the Literature, *Financial Markets, Institutions, and Instruments*, 10, pp. 41-84.
38. Schildback, J., Wenzel, C. and Speyer, B. (2013). Bank Performance in the U.S. and Europe, *Deutsche Bank Research*, (September 26, 2013).
39. Shim, J. (2013). Bank Capital Buffer and Portfolio Risk: The Influence of Business Cycle and Revenue Diversification, *Journal of Banking and Finance*, 37, pp. 761-772.
40. Stolz, S. (2002). The Relationship Between Bank Capital, Risk-Taking, and Capital Regulation: A Review of the Literature, *Manuscript, Kiel Institute for World Economics*.
41. VanHoose, D. (2006). Bank Behavior Under Capital Regulation: What Does The Academic Literature Tell Us? Networks Financial Institute Working Paper (2006-WP-04).
42. Van Hoose, D. (2007). Theories of Bank Behavior Under Capital Regulation, *Journal of Banking and Finance*, 31, pp. 3680-3697.
43. Weigand, R. (2013). The Recovery of US Commercial Banking: An Analysis of Revenues, Profits, Dividends, Capital and Value Creation, *Banks and Bank Systems*, 8 (3), pp. 76-88.
44. Yang, J. and K. Tsatsaronis (2012). Bank Stock Returns, Leverage and the Business Cycle, *Bank for International Settlements Quarterly Review*, (March), pp. 45-59.