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Monetary policy, financial regulation and financial stability: A comparison between the Fed and the ECB

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**Monetary Policy, Financial Regulation
and Financial Stability: A Comparison
between the Fed and the ECB**

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Monetary Policy, Financial Regulation and Financial Stability: A Comparison between the Fed and the ECB

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Abstract:

The paper analyses in light of Austrian and Keynesian economic theory the impact of conventional and unconventional monetary policies as therapies for financial crises. It compares the financial market stabilization measures of the Federal Reserve System and the European System of Central Banks in response to the US subprime crisis and the European financial and debt crisis. It is shown that the Federal Reserve System's crisis measures were more directed towards stabilizing the banking system, whereas the European Central Bank had a stronger focus on the stabilization of the debt affordability of euro area crisis countries. In both cases, household credit growth remained under control despite renewed monetary expansion, while new imbalances emerged in the corporate sector. In the euro area, loose monetary policy had a destabilizing impact on the financial sector.

Keywords: Financial cycles, financial crisis, financial stability, Hayek, Keynes, monetary policy.

JEL-Codes: B53, E12, E14, E30, E44, E58, G10, G20, H30, H50.

1. Introduction

Since the second half of the 1980s the world has experienced several booms in financial markets, which were followed by severe crises. Major crisis events were the bursting of the Japanese bubble economy (1989), the Asian crisis (1997/98), the bursting of the dotcom bubble (2000), the US subprime crisis (from 2007) as well as the European financial and debt crisis (from 2007). A common feature of many of these crises was that the pre-crisis upswings were driven by fast credit growth, with exuberance emerging in stock and real estate markets as well as in other segments of financial markets.

The third generation of crisis models (e.g. Krugman 1998, Corsetti, Pesenti and Roubini 1999) has stressed the role of over-lending and over-borrowing for non-sustainable investment, stock and real estate booms in Southeast Asia. Since then, there has been a growing focus on the role of credit growth for unsustainable booms, which tend to lead into banking and financial crisis. For instance, Kraft and Jankov (2005) linked rapid credit growth in Croatia to an increased probability of credit deterioration, current account deficits and increasing foreign debt.

Also the role of monetary policy and interest rates for unsustainable credit cycles has been scrutinized. Jiminéz et al. (2014) show for pre-crisis Spanish banks that low overnight interest rates induced lowly capitalized banks to grant more loans to risky firms. Paligorova and Santos (2017) argue for the United States that loan spreads for riskier firms became relatively lower during periods of monetary easing, accompanied by increased risk taking. Dell'Arriccia and Marquez (2006) show that during upswings the demand for loans increases and the lending standards decrease. According to Bonfim and Soares (2018) riskier borrowers have better access to credit, when interest rates are lower.

This implies that – in particular in a persistent low interest rate environment – the probability of risk-taking is larger and the regulation of credit growth is crucial to maintain financial stability (Dell'Arriccia et al. 2012). Therefore, after the outbreak of the US subprime and European financial and debt crisis, both authorities in the US and the European Union have taken broad measures to ensure financial stability. In the paper we analyze the success of these attempts in a comparative approach between the United States and the euro area, based on the theoretical frameworks of Mises (1912), Hayek (1929), Keynes (1936) and Minsky (1977).

2. Monetary Expansion as a Cause and Remedy for Financial Crisis

In the view of the Austrian overinvestment theory as formulated by Mises (1912) and Hayek (1929) low interest rates can be a source of financial instability, whereas in the view of Keynes (1936) and Minsky (1977) interest rate cuts in the face of crisis are an important instrument of financial stabilization.

2.1. Monetary Expansion as a Source of Financial Instability

Mises (1912) and Hayek (1929) distinguish four types of interest rates to model the role of interest rates for an unsustainable credit boom.¹ First, the internal interest rate reflects the (expected) returns of (planned) investment projects. Second, the natural interest rate is the interest rate that equilibrates the supply of capital (saving S) and the demand for capital (investment I) with no distortions in the capital stock ($S=I$).² Third, the central bank interest rate is the policy interest rate set by the central bank. It is assumed to guide the capital market interest rate, which – forth – commercial banks charge for their credits to the enterprises.

In Mises (1912) and Hayek (1929) an economy is in equilibrium when the natural rate of interest equals the central bank interest rate, i.e. planned savings are equal to investment. An upswing starts when positive expectations – for instance due to an important innovation – raise the internal interest rate of investment. Alternatively, the central bank may cut the central bank rate exogenously. This brings about a rise in investment, which is financed by commercial banks by creating additional loans and deposits.

To market participants a rise in credit to the private sector at a constant or lower interest rate signals that saving activity of households increased and future consumption will rise. This

¹ For details on the Austrian overinvestment theory see Schnabl (2019).

² The natural interest rate is a theoretical concept and not observable. Hayek (1929, 1931) emphasized the importance of the intertemporal misalignments of plans of producers and consumers to derive mal- or overinvestment as mismatch between the production structure and consumer preferences. The natural interest rate is the interest rate that aligns savings and consumption preferences with the production structure over time. A fall in the central bank interest rate and capital market interest rate below the natural interest rate causes a cumulative inflationary process, creating distortions in the production structure that later make an adjustment necessary (unless the central bank keeps on inflating credit at an ever-increasing pace and artificially prolongs the credit boom). In contrast, Wicksell (1898) saw the natural interest rate as an inflation-neutral interest rate, which is a concept on which Woodford (2003) build upon.

justifies the buildup of additional production capacities to satisfy the expected rise in future consumption. As planned household saving does not increase, an unsustainable disequilibrium between ex-ante saving and investment arises. A higher investment activity of some enterprises trigger additional investments of other enterprises, which accelerates the upswing (cumulative upward process). As soon as capacity limits are reached and unemployment is low, the bidding for workers intensifies, hence wages and prices rise.

Rising prices signal higher profit margins and therefore trigger additional investments. Growing profits for enterprises and banks may also lead to an increase of stock prices. Given relatively low interest rates on bank deposits, shares are an attractive investment class. When stock prices move upward, more agents will swim with the tide, which will drive stock prices further up such that “*the symptoms of prosperity themselves finally become [...] a factor of prosperity*” (Schumpeter 1912, 226). Consumption is boosted as wages rise and elevated stock prices make people feel wealthier.

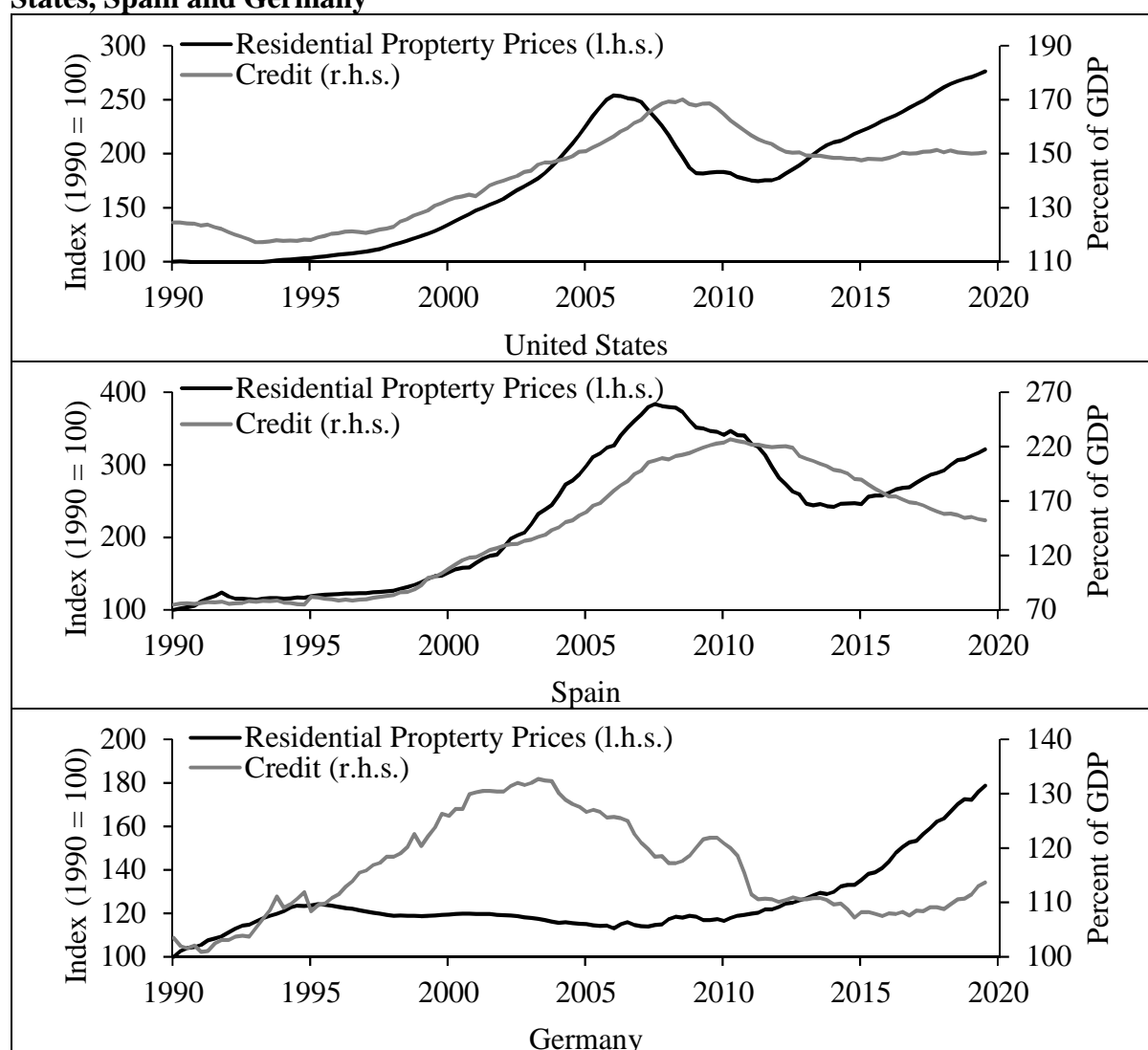
The boom ends, when the central bank lifts the interest rate to slow down the accelerating inflation (Mises 1912, Hayek 1929, 1931, 1937). Past and future investment projects with internal interest rates below the now higher central bank and commercial bank interest rates turn out to be unprofitable. As first investment projects have to be dismantled, more investment projects become unprofitable. When stock (and other asset prices) burst, balance sheets of firms and banks deteriorate, causing further disinvestment (cumulative downward process). Because investments decrease, the natural interest rate falls.

In this situation, the central bank can cut the central bank interest rate to contain the downward-spiral. Yet, when the central bank interest rate is kept too high, the downturn is aggravated beyond what would be necessary to remove the structural distortions. Mises (1912), Hayek (1931) and Schumpeter (1912) see the dismantling of low-return investment projects as a necessary “*cleansing process*” of structural distortions in the economy. Resources which were moved to investment projects with comparatively low marginal efficiency during the upswing are freed up and unemployment rises. Exuberance on stock and real estate markets is corrected. As prices and wages fall, the basis for a sustainable economic recovery is created. Labor and capital can be shifted to new investment projects with a higher marginal efficiency.

In line with the overinvestment theory of Mises (1912) and Hayek (1929), a credit boom in the

US housing market evolved, after the Fed had cut the federal funds rate in response to the bursting of the dotcom bubble from 6.5% in May 2000 to 1.0% by June 2003 (Figure 2).³ Real estate prices started to rise, also encouraged by deregulation and financial innovations. The real estate index for residential property in the whole country increased between May 2000 and June 2007 by roughly 60% (upper panel of Figure 1). At the same time, a stock market boom evolved, with the DOW rising from 7692 points in 2003 to 13920 points by 2007. The real estate boom encouraged a consumption boom, as increasing valuations of real estate served as collateral for additional consumer credit, with the boom being transmitted via buoyant credit growth (Figure 1).

Figure 1: Residential Property Prices and Credit to the Private Sector in the United States, Spain and Germany



Source: BIS.

³ Borio (2014) refers to the concept of unfinished recessions. Policy responses contain recessions in the short-term, but at the cost of a build-up of larger financial imbalances and economic dislocations in the medium-term.

In Europe, the European Central Bank cut the interest rate in response to the bursting of the dotcom bubble from 4.75% in May 2000 to 2.00% in June 2003. The interest rate cuts followed a substantial decline of interest rates in the southern euro area countries linked to their euro accession. This triggered inter alia real estate booms in Spain, Ireland and Greece, as shown in Figure 1 for Spain. The real estate boom did not evolve in the whole euro area, possibly due to the fact that fiscal policies within the euro area were uncoordinated. Whereas in the north Germany pursued a reform program and tight fiscal policies, in the southern boom countries a credit boom inflated tax revenues, thereby further encouraging more government spending.⁴ As in the US subprime boom, credit growth in the southern euro area played an important role for the transmission of the boom as shown in Figure 1 for Spain.

2.2. Monetary Policy as a Stabilizer for Financial Markets

In the view of Keynes (1936) the exuberant boom prior to the world economic crisis in the 1930s was driven by too optimistic expectations (animal spirits⁵) regarding the future yield of capital goods. According to Keynes (1936: 281) speculators are more concerned with forecasting market sentiments rather than the future yield of capital assets. When the market is over-optimistic and over-bought, “*it should fall with sudden and even catastrophic force*” (Keynes 1936:281). Based on Keynes (1936), Hansen (1939) explained the stagnation in the 1930s by structural factors such as a declining marginal efficiency of investment, declining population growth and a structurally increasing (declining) savings (consumption) rate due to an increase of income levels.

The policy proposition of Keynes (1936) was to keep the interest rate low⁶ and to stimulate the economy by increasing government demand and the redistribution of income to lower income

⁴ For details see Schnabl (2019).

⁵ “*Even apart from the instability due to speculation, there is the instability due to the characteristic of human nature that a large proportion of our positive activities depend on spontaneous optimism rather than mathematical expectations, whether moral or hedonistic or economic. Most, probably, of our decisions to do something positive, the full consequences of which will be drawn out over many days to come, can only be taken as the result of animal spirits - a spontaneous urge to action rather than inaction, and not as the outcome of a weighted average of quantitative benefits multiplied by quantitative probabilities.*” (Keynes 1936: 141)

⁶ “*Moreover, even if over-investment in this sense was a normal characteristic of the boom, the remedy would not lie in clapping on a high rate of interest which would probably deter some useful investments and might further diminish the propensity to consume, but in taking drastic steps, by redistributing incomes or otherwise, to stimulate the propensity to consume.*” (Keynes 1936: 285-286).

classes with a higher propensity to consume. Lower and persistently low interest rates should enable the boom to last. *“The right remedy for the trade cycle is not to be found in abolishing booms and thus keeping us permanently in a semi-slump; but in abolishing slumps and thus keeping us permanently in a quasi-boom.”* (Keynes 1936, 286).

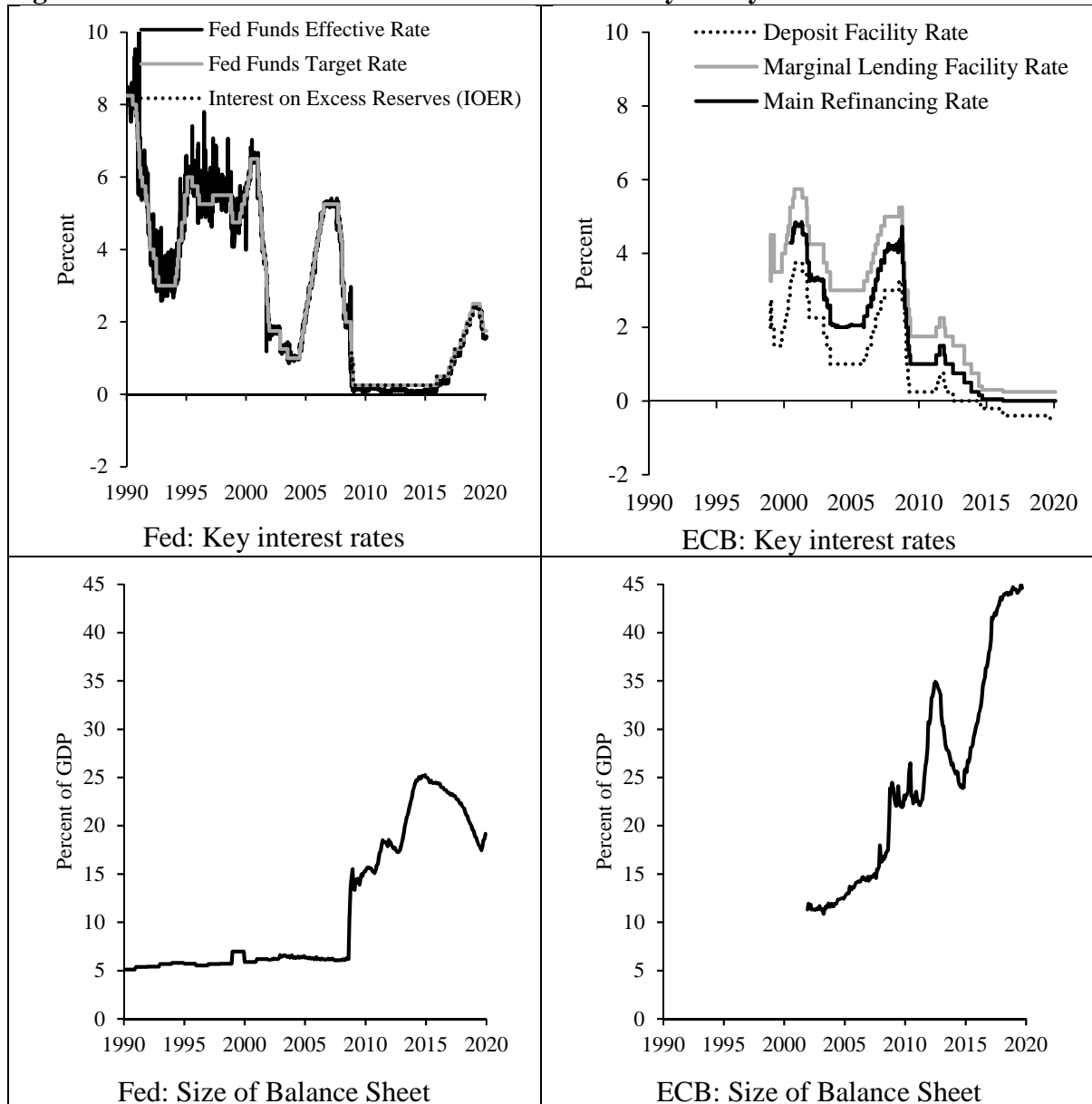
Minsky (1977) built upon Keynes (1936) adjusting the policy strategy to a higher degree of development of capital markets in the 1970s, viewing the economy *“from the board room of a Wall Street investment bank”* (Minsky 1977: 7). He acknowledged that the economy has sophisticated financial institutions, with credit creation and investment activity determining the behavior of the economy. In his view, an unsustainable boom is triggered by economic stability and optimistic expectations, as the expectations about *“the appropriate liability structure for the financing positions are subjective”* (Minsky 1977: 12). During a financial market boom the credit quality deteriorates, which finally leads into crisis.⁷

Minsky (1977) recommended expansionary fiscal and monetary policies to forestall a recession. A tighter regulation of financial markets is recommended to prevent a revival of financial market exuberance on the back of low interest rates. *“(…) [I]n order to do better than hitherto, we have to establish and enforce a “good financial society” in which the tendency by business and bankers to engage in speculative finance is constrained”* (Minsky 1977: 16).

Figure 2 shows that both the Federal Reserve Bank and the European Central Bank cut interest rates strongly in response to the outbreak of the crises in 2007/2008. The Federal Reserve cut interest rate from 5.25% in Sept. 2007 to close to 0% by December 2008. The European Central Bank cut interest rates from 4.25% in July 2008 to 0% by March 2016. The Federal Reserve System implemented quantitative easing in three phases starting in December 2008. The European Central Bank moved towards a decisive quantitative easing following the European debt crisis.

⁷ Credit obligations can be decomposed into interest payment and repayments (due credit). Minsky (1986) distinguished three types of credit: *Hedge Finance*: “[T]he cash flows from operations are expected to be large enough to meet the payment commitment on debts” (Minsky 1977: 13). Typically debt is low. *Speculative Finance*: The cash flows from investment are sufficient to pay interest. Due credit is repaid by new credit. *“For Ponzi finance units, financing costs are greater than income so that the face amount of outstanding debt increases”* (Minsky 1986: 231).

Figure 2: Conventional and Unconventional Monetary Policy Tools of Fed and ECB



Source: FED, ECB, IMF, OECD.

3. Financial Crisis and Monetary Stabilization

The policy responses to the subprime crisis and the European financial and debt crisis mainly correspond to the policy recommendation of Minsky (1977). Interest rates were reduced to zero⁸, government expenditure was extended and financial regulation was tightened. With the

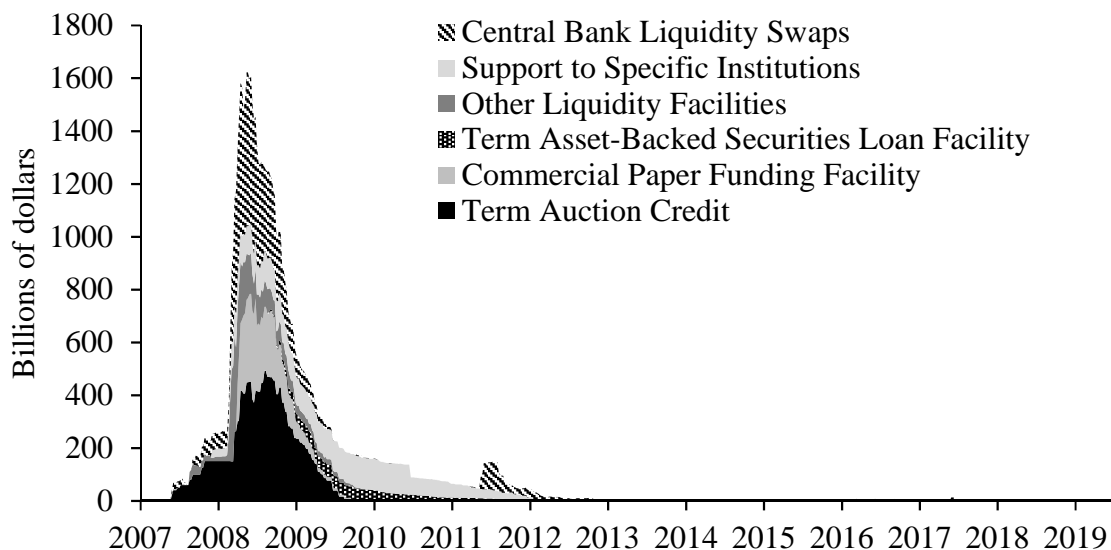
⁸ In response to the 1929 New York stock market crash, the Federal Reserve had kept the interest rate high to deflate the bubble. This was later criticised by Friedman and Schwarz (1963) in their monetary history of the United States a severe policy mistake. Therefore, Bernanke (1995) argued: "In their classic study of U.S. monetary history, Friedman and Schwartz (1963) ... arguing that the main lines of causation ran from

advent of quantitative easing, the traditional form of “market-neutral” monetary policy making was abandoned, as the quantitative nature allowed for sector-specific monetary policies, in particular in the case of the European Central Bank.

3.1. Financial Market Stabilization Measures in the US

The US subprime crisis started with money market funds stopping overnight lending. As the money market dried out, the Federal Reserve felt forced to maintain liquidity conditions. Figure 3 shows the short-term measures of the Federal Reserve System, which maintained liquidity to banks, other depository institutions and other financial institutions.

Figure 3: Short-term Liquidity Measures of the Federal Reserve System



Source: Board of Governors of the Federal Reserve System.

Inter alia, the Fed provided credit via the Term Auction Facility to banks at a maturity of one to three months, while all credits had to be fully collateralized. The program ensured the liquidity of short-term funding markets. The Commercial Paper Funding Facility enhanced the liquidity in the commercial paper markets. Via a limited liability company three-month unsecured and asset-backed commercial paper was bought from October 2008 to February 2010. The credit remained outstanding until all commercial paper had matured.

monetary contraction—the result of poor policy—making and continuing crisis in the banking system—to declining prices and output.”

Under the Term Asset-Backed Securities Loan Facility, the Federal Reserve Bank of New York provided loans with terms up to five years to holders of eligible asset-backed securities. This accommodated the credit needs of consumers and enterprises by facilitating the issuance of asset-backed securities collateralized with consumer and business loans.⁹ Central Bank Liquidity Swaps provided dollar liquidity to other central banks, inter alia to the European Central Bank and the Swiss National Bank. The swaps were designed to improve liquidity conditions in dollar funding markets in the United States and abroad and enabled foreign central banks to provide dollar funding to financial institutions in their jurisdictions.

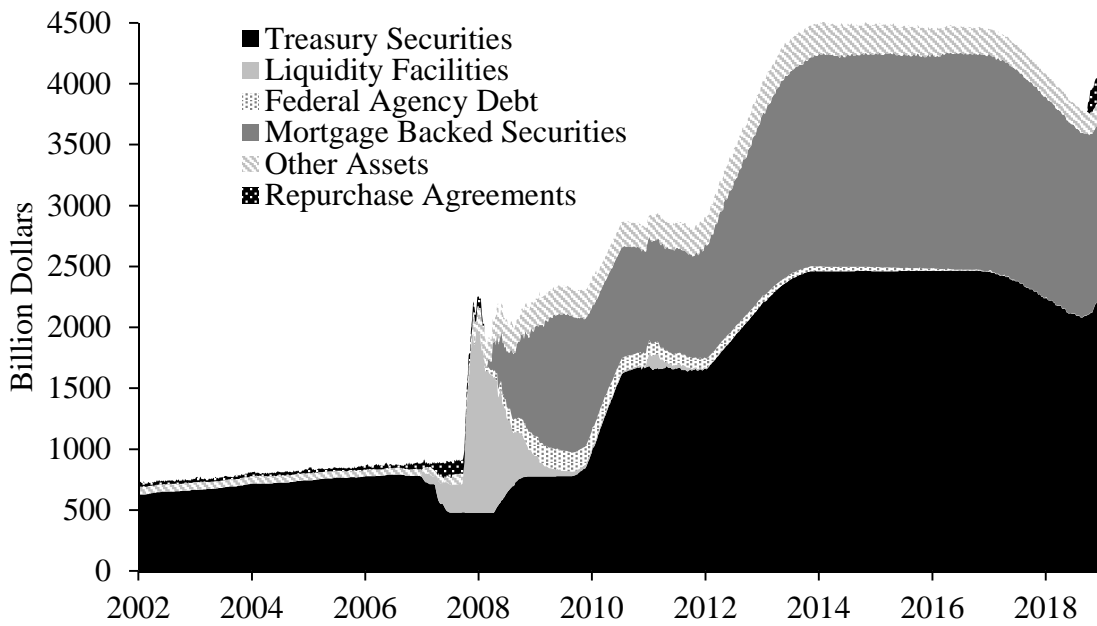
The short-term liquidity measures had mainly matured by 2010 and were followed by more long-term monetary policy operations labelled quantitative easing (QE). Through three quantitative easing programs, which went beyond the traditional tools of open market operations, the Federal Reserve System de facto transformed the short-term liquidity measures into longer term operations, while further extending the scale until the end of the year 2014.¹⁰ The goal was to maintain the functioning of the credit markets. Through the purchase of longer-term securities, long-term interest rates were reduced and the yield curve was flattened (see Figure 14 in the appendix).

QE1 was performed from November 2008 by buying mortgage-backed securities and treasuries (see Figure 4). By November 2009, the Federal Reserve System had accumulated 1400 billion dollars of mortgage-backed securities and treasuries. The Fed announced QE2 in November 2010. Until June 2011 treasuries equivalent to 1500 billion dollar and mortgage-backed securities equivalent to 900 billion were bought (QE2). QE3 was announced in September 2012 as an open-ended bond purchase program (also called QE-Infinity), with a volume of 40 billion dollars per month. In addition, the Federal Open Market Committee announced to maintain the federal funds rate to be kept near zero at least through 2015. In December 2012, the monthly purchases of treasuries were increased to 85 billion dollars per month. Purchases were halted in October 2014 after having accumulated assets equivalent to roughly 4.500 billion dollars.

⁹ For instance student loans, auto loans, credit card loans, loans guaranteed by the Small Business Administration.

¹⁰ For a survey see: https://www.federalreserve.gov/monetarypolicy/bst_crisisresponse.htm.

Figure 4: Balance Sheet of the Federal Reserve System



Source: Federal Reserve System.

Based on the Emergency Economic Stabilization Act (October 3 2008), the US Treasury initiated the Troubled Asset Relief Program (TARP), for which the Congress raised the debt ceiling to 11.315 trillion dollars (Webel 2013). The TARP program injected capital into banks and some enterprises. Via TARP the expansionary monetary policy of the Federal Reserve System was aligned with an expansionary fiscal policy. The US government bought preferred stocks in eight banks¹¹ equivalent to 105 billion dollars. In January 2009, the TARP was extended inter alia to support 23 community banks, the insurance company American International Group, three car companies and individual home owners. In sum 420 billion dollars were disbursed. Table 1 provides an overview.

Table 1: Outlay of TARP Funds (\$ in billions)

TARP Program	Obligated Amount	Actual Disbursements
Bank Support Programs	\$250.46	\$245.10
Credit Market Programs	\$ 20.08	\$ 19.09
AIG	\$ 67.84	\$ 67.84
Auto Industry Financing Program	\$ 79.69	\$ 79.69
Housing Support	\$ 38.49	\$ 8.25
Totals	\$456.56	\$419.97

Source: Webel (2013: 5).

¹¹ Bank of America/Merrill Lynch, Bank of New York Mellon, Citigroup, Goldman Sachs, J.P. Morgan, Morgan Stanley, State Street, and Wells Fargo.

The obligation to pay a dividend of 5 percent on capital injections that were increased to 9 percent in 2013 encouraged banks to buy back the stocks. As the monetary policy of the Federal Reserve reanimated financial markets, inter alia driving up real estate and stock prices again, the balance sheets of banks, financial institutions and enterprises were stabilized. Banks, auto companies and AIG could repay 376 billion dollars, which strongly reduced the costs of the program.

3.2. Financial Market Stabilization Measures in the Euro Area

The crisis in the euro area occurred in contrast to the United States only in parts of the euro area. The boom phases had only evolved in some southern and western euro area countries such as Greece, Spain, Portugal and Ireland, being nurtured by capital inflows from other euro area countries.¹² When the crisis hit in 2008, the threatening collapse of banks – both in the crisis countries and the creditor countries – had to be addressed by the national governments as a supra-national financial safety net did not exist. Archarya et al. (2018) show based on the data from the state aid register of the European Commission the extensive government interventions undertaken at the national level to stabilize banks and the financial sectors.¹³

Beyond the crisis countries Cyprus, Greece, Ireland, Portugal and Spain, a particular large number of financial stabilization measures took place in Germany, where banks had previously to the crisis engaged in extensive foreign lending. Many Austrian banks had engaged in extensive lending in Central and Eastern Europe. The high costs of the recapitalization measures are reflected in strong hikes of government debt (as percent of GDP) in most euro area countries. As a result of the rescue measures, most euro area countries, including Germany, drifted far away from the 60%-of-GDP-Maastricht limit for government debt.

As the financial stabilization measures were primarily handled by national governments, the European Central Bank in the first phase continued to increase key interest rates to 4.25% by

¹² In Germany, restrictive fiscal and wage policies as well as new incentives being set for savings, induced strong capital outflows, which boosted growth and contributed to unsustainable booms in other euro area countries and beyond (Schnabl 2019).

¹³ The fiscal interventions are sub-divided into recapitalization, government guarantees, other liquidity support and troubled asset relief. The register identifies the type of recapitalization, the eligible liabilities, the type of liquidity support and type of troubled asset relief along with the specific amount and the duration of the measures.

July 2008 in response to an above target inflation rate. The ECB cut interest rates only from November 2008 and more hesitantly than the Federal Reserve (Figure 2). The policy of the European Central Bank changed fundamentally when strongly diverging interest rates on euro area government bonds – now including the highly indebted Italy – threatened to break up the euro area. The reversal is marked by the statement of ECB president Mario Draghi that the European Central Bank would do “*whatever it takes*” to preserve the euro area.¹⁴

Like the Fed, the European Central Bank took several unconventional measures to stabilize the financial sector in the euro area. Starting from March 2008, the ECB launched several rounds of Long-term Refinancing Operations (LTRO) to inject low-interest rate funding to euro area banks with sovereign debt as a collateral. The banks could use the low-cost funds to invest in higher-yield assets (such as government bonds) to stabilize their balance sheets. The resulting increasing demand for government bonds reduced long-term interest rates. The Targeted Long-term Refinancing Operations (TLTROs), which were implemented since 2014, tied low interest rates to the credit provision to enterprises. In September 2019 the ECB decided to renew the Targeted Long-term Refinancing Operations with an estimated volume of about 800 billion euros.¹⁵ Today, Main Refinancing Operations (MROs) and LTROs only play a minor role in the ECB monetary policy operations.

The scale of bond purchase programs gradually expanded. Between 2010 and 2012 the ECB bought bonds equivalent to 211 billion euros in the Securities Market Programme (SMP). The Covered Bond Purchase Programs (CBPP1, 2, 3) incorporated purchases of covered bonds of 76.4 billion euros between 2009 and 2012. As the program expired, the Outright Monetary Transactions Programme (OMT) of July 2012 announced to buy up any amount of government bonds necessary to maintain the euro area, but the program was never activated. The originally secret Agreement on Net Financial Assets (ANFA) allowed the national central banks to purchase financial assets related to national government debt of up to a total volume of 500 billion euros since October 2014.

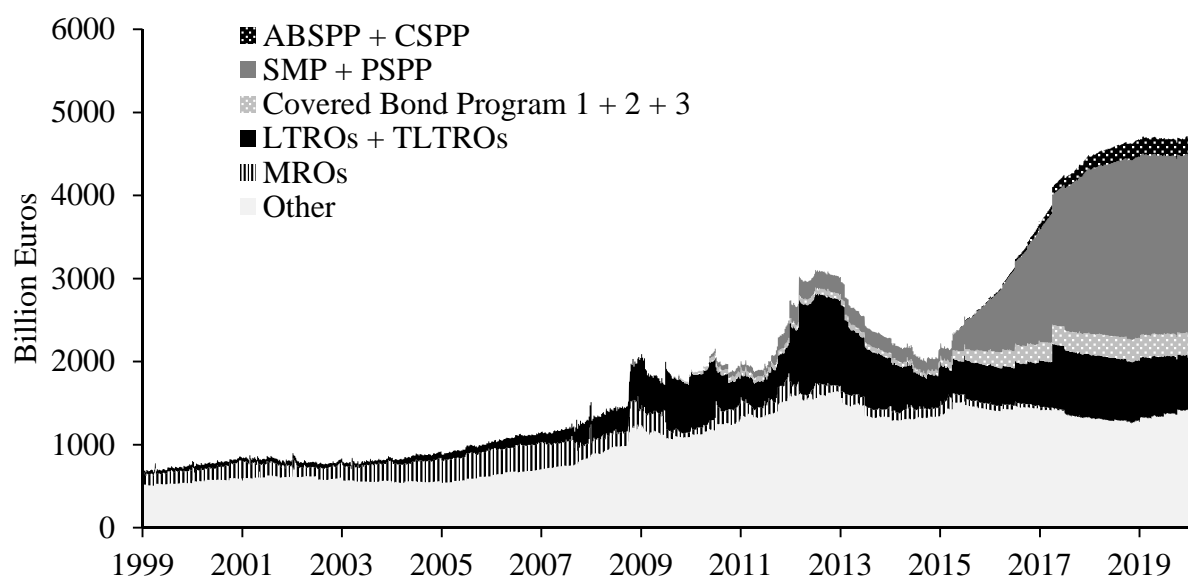
Figure 5 shows the balance sheet of the European System of Central Banks, which summarizes

¹⁴ “*Within our mandate, the ECB is ready to do whatever it takes to preserve the euro. And believe me, it will be enough.*” (Draghi 2012).

¹⁵ The LTROS were behind the first strong expansion of the ECB balances sheet between 2008 and 2012. Most long-term credit operations were provided to Spanish and Italian banks.

the scale of rescue operations, which have been taken place via monetary policy operations. Government bonds have taken the most important share of financial stability measures, followed by long-term credit operations for banks and corporate bond purchases. The strong expansion of the ECB balance sheet has both flattened and pushed downward the yield curve. In mid 2019 for the average yield curve for the whole euro area had moved into negative territory over the whole scope of maturities (see Figure 14 in the appendix).

Figure 5: Structure of the Balance Sheet of the European System of Central Banks



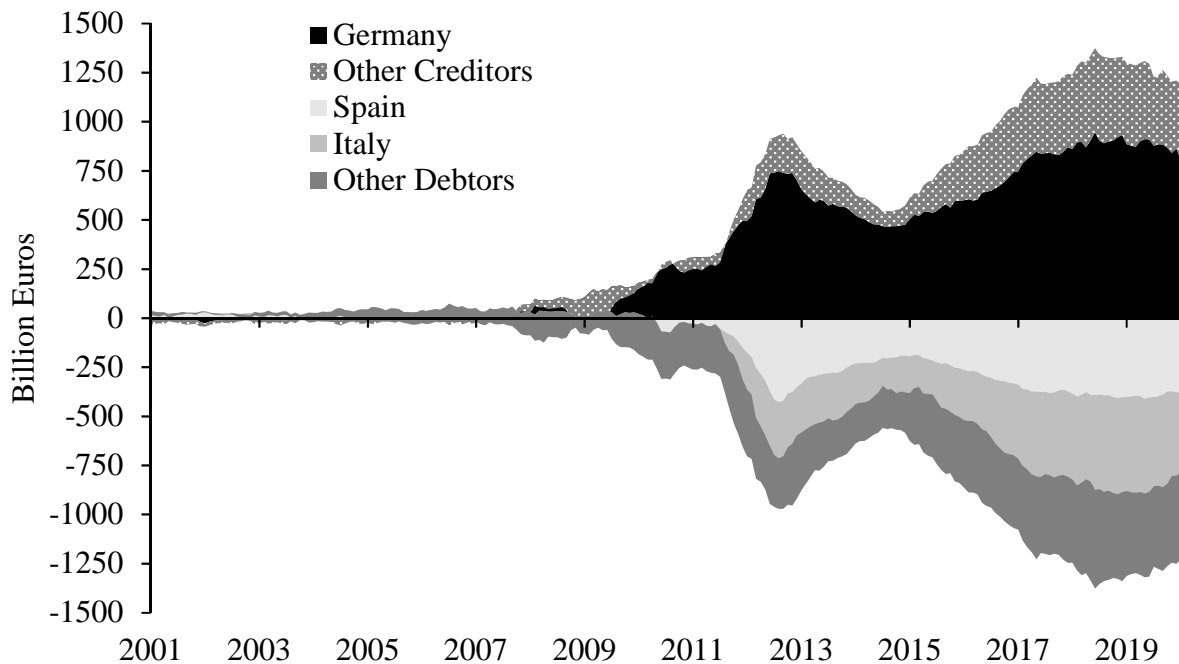
Source: European Central Bank.

Emergency liquidity assistance was provided in addition to monetary policy operations, for instance to Greece (90 billion euros), which was excluded from the ECB government bond purchase program. The largest expansion of the ECB balance sheet occurred between March 2015 and December 2018. In the Public Sector Purchase Program (PSPP) approx. 2000 billion euros and in the Corporate Sector Purchase Program (CSPP) approx. 300 billion euros were allocated. All in all, assets amounting to approximately 2.600 billion euros were purchased, extending the balance sheet of the European Central Bank to about 45% of GDP (Figure 2, Figure 5).

Although the European Monetary Union did not stipulate a credit mechanism for over-indebted member states, the TARGET2 payment system operated by the European System of Central Banks constituted an implicit credit mechanism (Sinn and Wollmershäuser 2012). Germany, Luxemburg, Finland and the Netherlands were providing quasi-credit to mostly southern euro

area countries, linked to the ECB’s monetary policy and credit operations. Since 2007, the TARGET2 claims of the Deutsche Bundesbank have grown from zero to over 800 billion euros (Figure 6), which can be seen as a non-recoverable, quasi-unlimited, non-interest-bearing credit (Sinn 2016).¹⁶

Figure 6: TARGET2-Balances of the European System of Central Banks



Source: ECB, Euro Crisis Monitor.

The European governments and supra-national institutions created ad hoc credit mechanisms such as multilateral bailout packages for Greece, Ireland and Portugal, the European Financial Stability Mechanism (EFSF) and the European Financial Stabilization Mechanism (EFSM). Finally, the European Stability Mechanism (ESM) with a scale of 500 billion euros was created, which aims to serve as a lender of last resort for euro area countries and banks.

4. Regulatory Stabilization and Persistence of Monetary Expansion

In both the United States and the European (Monetary) Union extensive regulatory measures were taken to prevent excessive credit growth in the future. Also, both in the United States and the euro area, the balance sheets of the central banks were strongly expanded. One important

¹⁶ Hellwig and Schnabel (2019) argue that the TARGET2 claims cannot be interpreted as credits and do not create risks for taxpayers.

difference between the financial stabilization measures of the United States and the euro area is the time dimension. Whereas the crisis broke out both in the United States and Europe in the years 2007/2008, the Federal Reserve System responded faster by interest rate cuts and quantitative easing and also left earlier the low interest rate environment (albeit at a limited extend).

The ECB acted more hesitantly and did not tighten monetary policy during the post-crisis recovery. After unconventional monetary policy measures had created large excess reserves of commercial banks at the central bank, the Federal Reserve Board decided to pay positive interest rates on excess reserves, whereas the European Central Bank charges negative interest rates since 2014. The different policy approaches had different implications for the recovery of the banking sectors.

4.1. Interest Margins

The persistent low interest environment had implications on the interest rate margins in the banking business.¹⁷ Traditionally the main sources of income of banks have been the transformation margin (defined as long-term interest rate minus short-term interest rate), the passive margin (defined as money market rate minus deposit rate) and the credit margin (defined as credit rate minus deposit rate or money market rate).

The central banks first pushed money market rates towards zero and then depressed interest rates at the longer end of the yield curve, inter alia via quantitative easing. This gradually eliminated the transformation margin in both the United States and the euro area (see upper panels of Figure 7 and Figure 8). Previously to the global financial crisis, the transformation margins in the United States and Europe had been mainly positive, except in phases of interest rate increases when short-term interest rates increased faster than long-term interest rates. From 2010 onwards, both short-term and long-term interest rates were nudged towards (and even below) zero. This deprived the commercial banks of the transformation margin as an important source of income.

¹⁷ With Japan running ahead of the United States and Europe in zero-interest rate policies and quantitative easing, the negative impact on credit margins and respective implications on the banking sector became visible earlier (Gerstenberger und Schnabl 2017).

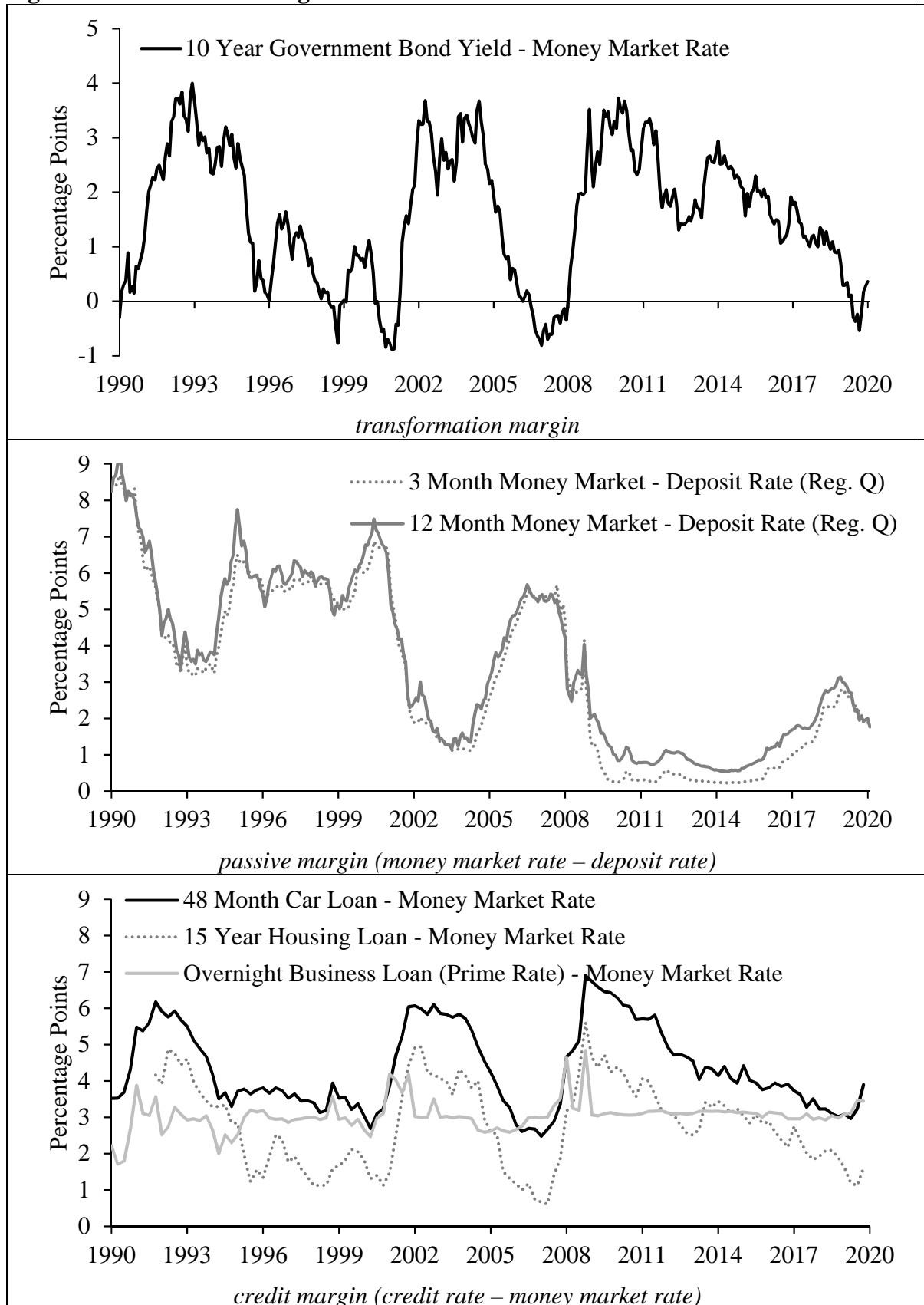
The passive margins, i.e. the margin earned when idle deposits are invested in the money markets, in both the United States and Europe converged towards zero, as money market rates were pushed to zero and commercial banks felt constraints in setting deposit rates below zero.¹⁸ As shown in the center panels of Figure 7 and Figure 8 in both the United States and the euro area the passive margins approached the zero-bound after the outbreak of the global financial crisis. The passive margins diverged from the zero-bound from December 2015 onwards, when the Federal Reserve started to lift the federal funds rate from 0 - 0.25% to 2.25% - 2.5% by December 2019, which increased the passive margin for US banks to about three percentage points, while it remained zero for euro area banks.

Furthermore, as both US and euro area banks have accumulated large amounts of excess reserves at the central bank in the course of the unconventional monetary policy measures, the interest rate on deposits of commercial banks at the central bank matters strongly for the profitability of banks. The Federal Reserve decided to increase the interest on excess reserves (IOER) from 0.25% in December 2015 to 2.4% in December 2018. In contrast, the European Central Bank opted, like the Bank of Japan, for a negative interest rate on deposits of commercial banks at the ECB. The interest rate cut on the deposit facility in June 2014 to -0.1% was followed by further cuts to -0.5% by September 2019.¹⁹ This also brought the money market rate into negative territory (Figure 2).

¹⁸ Note that until 2011, in the United States the so-called Regulation Q prohibited US banks from paying interest on demand deposits, which made money market funds attractive for depositors. Until 1986, there were also ceilings on savings and time deposits etc. The Regulation Q was abolished by the Dodd-Frank Act in 2010. In Germany, recently, an increasing number of banks is charging negative interest rates on deposits, in particular for new customers and customers with large deposits.

¹⁹ From Sept. 2019 like in Japan, a tier system was introduced, which created exemptions for negative interest rates on excess reserves for banks. The negative deposit facility rate is not applied up to a multiple of 6 of required reserves. Everything beyond this threshold is charged with a negative interest rate of -0.5%.

Figure 7: Interest Rate Margins in the United States



Source: Federal Reserve, OECD, Thomson Reuters.

In both the United States and the euro area, the persistent low interest rate environment continued to depress the credit margins of banks. In the United States between 2000 and 2019, the credit margin, calculated as the difference between the interest rate for corporate and housing loans minus the deposit rate declined from a range from 8.5% to 9.5% in 2000 to around 3.2% to 5% by 2020 (Figure 15 in the appendix).²⁰ The increase of the federal funds rate between 2015 and 2019 by 2.25 percentage points had only a limited positive impact on the credit margins. However, assuming that financing of US banks also occurs in the money market, the credit margin calculated as credit rate minus money market rate remained widely constant around 3 percentage points as shown in the lower panel of Figure 7.

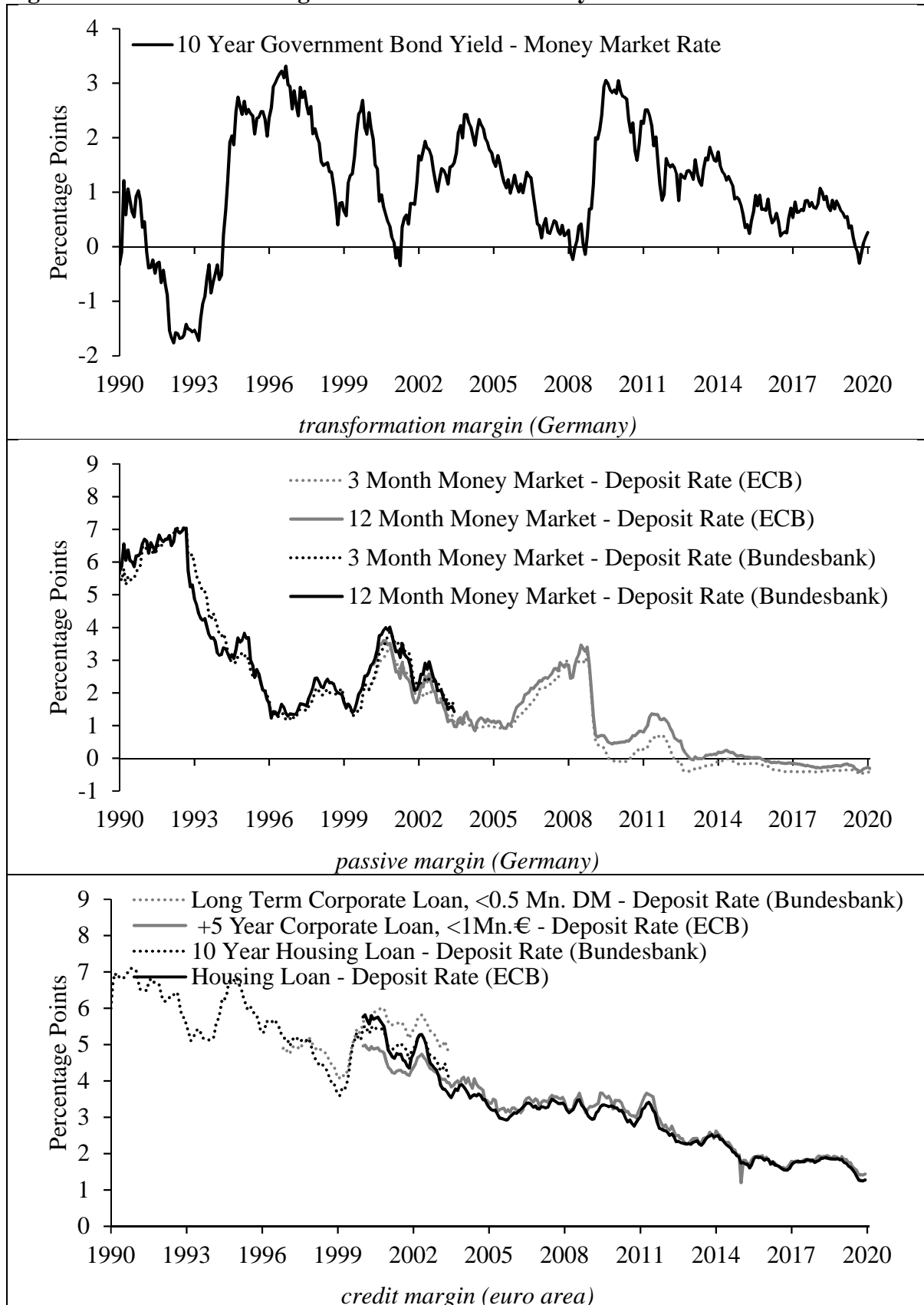
In the euro area, credit margins were compressed from a range of 4.3% to 5.5% in the year 2000 to around 1.2% to 1.3% by 2020 as shown in the lower panel of Figure 8. We assume that the financing of European banks by deposits plays a more important role than for US banks. A large number of small and medium savings and mutual banks have low loan-to-deposit ratios. In contrast, large banks rely more on other refinancing sources such as money markets.²¹

Figure 9 shows the impact of persistent low interest rate policies and quantitative easing on the net interest revenues of banks in the United States. In the United States the net interest rate income steadily increased until the outbreak of the subprime crisis and stagnated since then. Net interest revenues started increasing again since 2015, with the increase of the federal funds rate and the interest rate on excess reserves. The net interest income of US banks stopped increasing, when from January 2019 the Federal Reserve cut interest rates again. It is also shown in Figure 9 that the increase of net interest income since 2015 was mainly due to the rising interest rate on excess reserves.

²⁰ Note that also in previous periods the credit margin had declined to a similar extent. In contrast, the credit margin calculated based on the deposit rate gradually declined as in the euro area (Figure 16 in the appendix).

²¹ Small and medium Japanese banks have loan-to-deposit ratios smaller than one (Gerstenberger and Schnabl 2017).

Figure 8: Interest Rate Margins in Euro Area/Germany

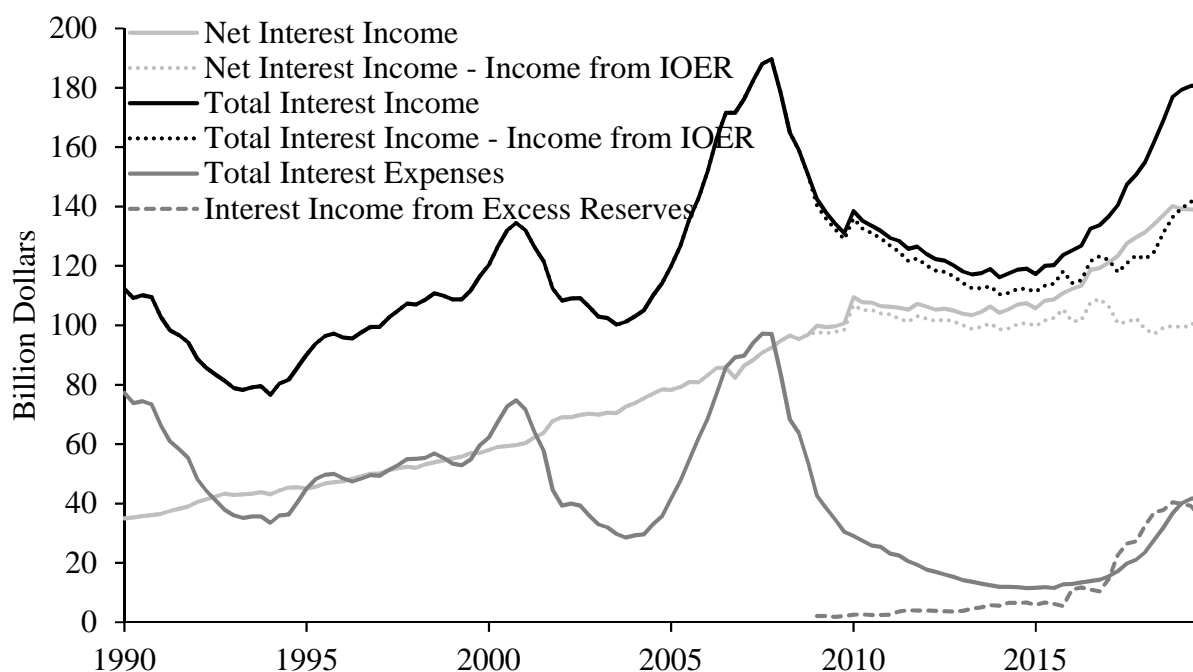


Source: ECB, Bundesbank, Thomson Reuters.

In contrast, the ECB charged an interest rate on deposits of commercial banks at the ECB, which further weakened the net interest rate income of commercial banks. From 2014 to 2019, euro area banks payed an equivalent of 34 billion dollars to the ECB, whereas US banks received around 120 billion dollars from the Fed. From this perspective, the increase of the interest on excess reserves in the US can be regarded as an implicit recapitalization of US banks, which did not take place in the euro area.²²

The upshot is that in particular euro area banks suffered from stagnating or declining net interest rate income as shown in Figure 10 for Spanish and German banks. While the increase of net interest income has mainly stopped with the outbreak of the global financial crisis for German banks, it is trending downwards since the year 2015. As the European Central Bank is expected to keep interest rates low for a long time, euro area banks are strongly concerned about further declining interest rate revenues and have started to cut costs by closing branches, reducing the number of employees and merging.

Figure 9: Interest Rate Income of US Banks

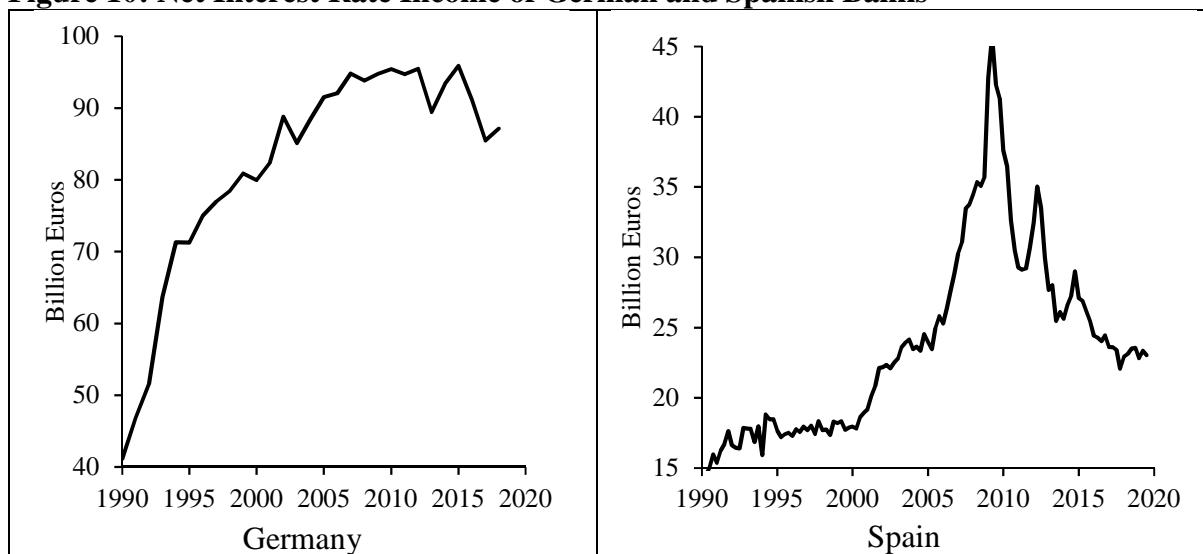


²² Selgin (2018) argues that the IOER rate was set unusually high in comparison to market-based short-term interest rates (e.g. LIBOR based on U.S. dollar). Even with regard to other “secure” short-term rates such as the Treasury General Collateral Finance Repo Rate or Treasury Bills with maturity of 1, 3 and 12 months the interest rate for excess reserves was high. This encouraged banks to accumulate excess reserves, instead of providing liquidity on money markets and credit to the private sector. Hence in the view of Selgin (2018) this policy contributed to the emergence of an above-zero liquidity trap in which monetary stimulus via asset purchases turned out to be ineffective or even contributed to the severity of the recession.

Source: FDIC, Federal Reserve and own calculations. Includes all US banks being covered by the deposit insurance scheme.

The stabilization of banks contributed to a stabilization of economic activity in the United States with a positive impact on borrowing by the private sector and lending by banks. In contrast, borrowing and lending tended to stagnate in the euro area – also due to an ailing banking sector – with economic activity remaining weak despite the historically low-interest rate level. At the same time, the US government extended government debt, which boosted economic activity and kept the interest rate of US governments bonds up. This helped to attract capital inflows. In contrast, fiscal austerity measures in the euro area linked to the Maastricht Treaty, depressed economic activity both in the crisis countries and Germany as well as the interest rates on euro area government bonds. This boosted capital outflows (mainly to the US), which became a drag on growth.

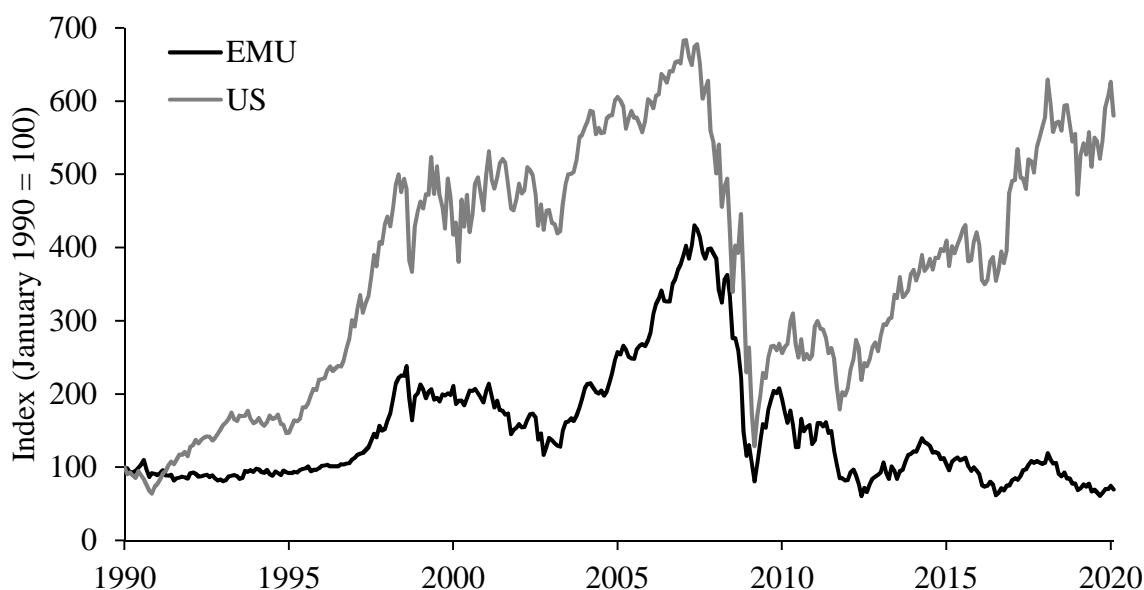
Figure 10: Net Interest Rate Income of German and Spanish Banks



Source: Deutsche Bundesbank and Banco de España.

As a consequence, the stock prices of large US banks and euro area banks have evolved in a very different way since the outbreak of the global financial crisis (Figure 11). The stock prices of the US banks have been moving upwards, as bad assets were removed from banks and banks were indirectly recapitalized. In contrast, the bad assets tended to remain stuck in the euro area banking system, as no active approach was taken to recapitalize banks, with banks being even forced to pay interest to the ECB.

Figure 11: USA and EMU: Equity Indices Banks



Source: Datastream Equity Indices for Banks.

4.2. Regulation and Incentives for Risk Taking

As both the US subprime crisis and the European financial and debt crisis were inter alia caused by excessive risk taking of banks and borrowers, post-crisis regulation aimed at preventing new risks in the future. Basel III increased the capital requirements for commercial banks in the USA and Europe. In the USA, the Dodd-Frank Act tightened the regulatory requirements, while the Volcker Rule restricted lucrative proprietary trading.

Recently, however, the reporting requirements for almost all US financial institutions have been eased again. Proprietary trading is still possible for large institutions indirectly as market makers. In the EU, since 2014 the ECB's Single Supervisory Mechanism has been monitoring the 130 largest financial institutions in the euro area, which have to fill a bank bailout fund with 60 billion euros by 2023. The EU has severely restricted proprietary trading, so that many, in particular large banks, have lost an important source of income.

Frequent stress tests by the ECB are a burden for the banks in the euro area, without the risks at several banks such as Dexia, BBVA/Garanti, Carige or Banca Monte dei Paschi having been recognized in time. Wobbly banks survive because they are kept afloat by national tax money,

European rescue programs and credit provision by the ECB (see section 3.2.).²³ An opaque network of rescue mechanisms (ESM, ELA, ANFA, etc.) has emerged. The ECB's TARGET2 payment system has turned out to be a quasi-unconditional, interest-free credit system: around 900 billion euros have accumulated in southern European central banks, with collateral requirements being gradually reduced (see Figure 6).

Nevertheless, the central banks induced more risk taking. After low interest rates had inflated real estate prices in the southern euro area and in Ireland between 2003 and 2008, since the year 2010 real estate prices in Germany started to increase fast (Figure 1).²⁴ On average, German real estate prices have increased since then by more than 50%, in growth regions close to 70%. The real estate boom was not accompanied by excessive credit growth as growing credit in the real estate sector came along with a stagnating credit provision to small and medium enterprises. Also, in the former euro area crisis countries and the United States the real estate prices recovered (see Figure 1 for USA and Spain).

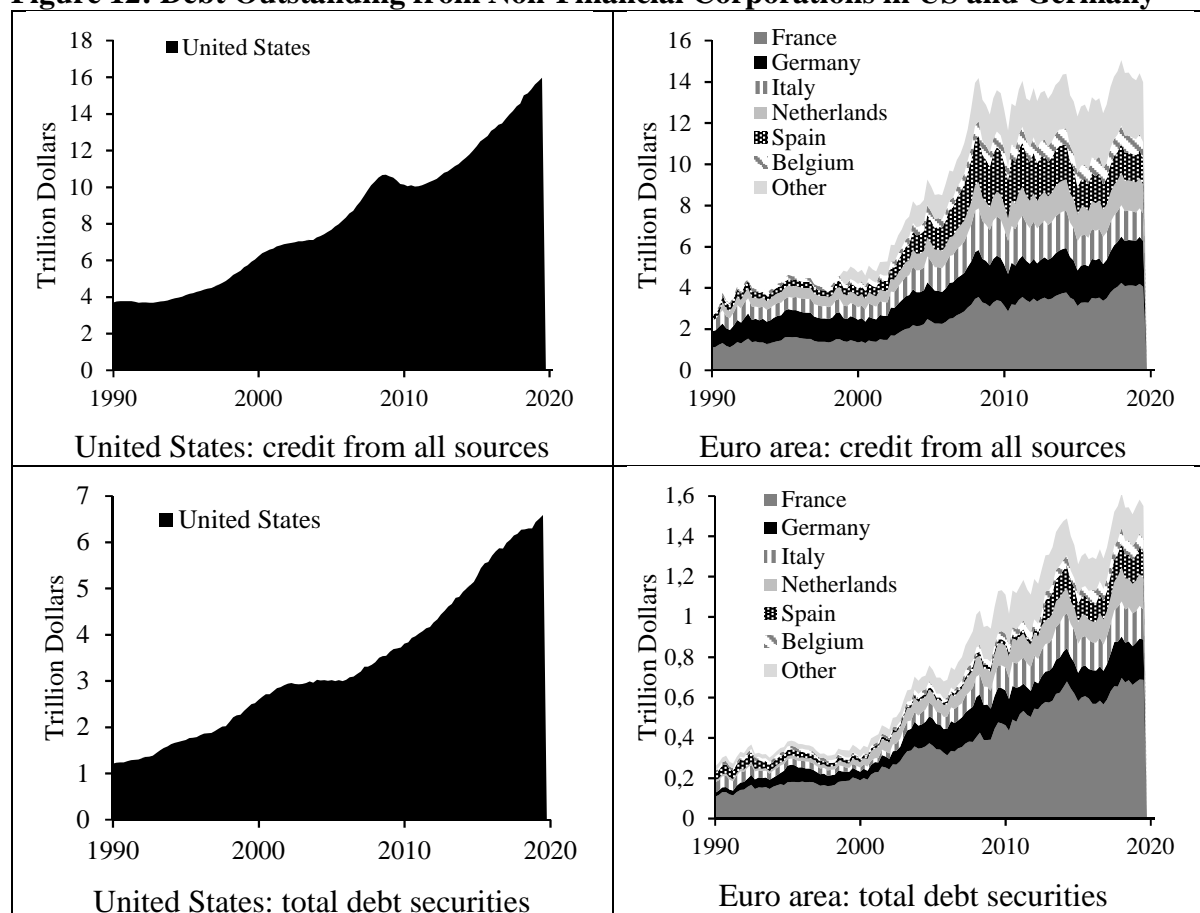
With banks being constrained in credit provision by regulation, the pre-crisis unsound credit growth was not repeated in the post-crisis ultra-low interest rate environment. This came along with a restraint on investment by small and medium enterprises, which are not able to issue ~~own~~ bonds. In contrast, the growth of bond issuance of large enterprises flourished, in particular in the United States, but also in Europe. Figure 12 shows that the amount of outstanding corporate bonds in the US and the euro area strongly increased. Çelik, Demirtaş and Isaksson (2020) show that particularly the share of risky bonds and bonds with long-term maturities increased in particular in the US and China.²⁵

²³ The "Failed Bank Tracker" has reported only 52 bankruptcies for the entire euro zone since 2008, compared with 541 in the USA. The disadvantage is that bad loans remain in balance sheets, so that their volume is between 650 and 1,000 billion euros. In 2018, the officially reported share of bad loans was 47% in Greece, 18% in Portugal and 12% in Italy (1.3% in the US). In the southern euro area in particular, zombie banks supported by the central banks are keeping a growing number of zombie companies alive.

²⁴ Schnabl (2019) argues that there has been a "waterbed effect" in the euro area with respect to credit allocation in the real estate sector in a low-interest rate environment. Between, 2003 and 2007 ~~low-cost~~ credit was predominantly allocated in the southern euro area, causing real estate bubbles. Since 2010, the liquidity has drifted into the German real estate market causing sharp price hikes. The idiosyncratic developments in the real estate markets of the euro area reveal unsynchronized business cycles as a core problem of the euro area.

²⁵ Schnabl (2019b) analyses the role of corporate debt in China, where the growth of the corporate debt market has been substantially large.

Figure 12: Debt Outstanding from Non-Financial Corporations in US and Germany



Source: BIS.

Additional funds for large corporations generated by both an increased activity in corporate bond issuance and declining interest rate expenses were used in the United States inter alia for leveraged buy-outs and stock buy-backs, which have been strongly driving up stock prices. In Europe, capital outflows to the United States accelerated, inter alia in the form of the build-up of production sites (FDI) and leveraged buy-outs. Therefore, price-earnings ratios have increased strongly, as shown for the US S&P 500 Shiller cyclically adjusted price-earnings ratio in Figure 13.

Mayer and Schnabl (2019) argue that the central-bank driven upward-shift in stock prices has eroded the incentive to increase efficiency, thereby putting a drag on productivity growth. The risk that a speculative bubble may burst in the enterprises sector seems to have substantially increased both for the United States and the euro area, while the US banking sector seems to be more resilient to a possibly upcoming crisis than euro area banks.

Figure 13: US S&P 500 Shiller Cyclically Adjusted Price-Earnings Ratio



Source: Macrobond.

5. Outlook and Economic Policy Implications

We have analyzed the role of conventional and unconventional monetary policies for financial stability in the context of the US subprime crisis and the European financial and debt crisis in the light of Austrian and Keynesian economic theory. Austrian economic theory helps to explain the role of central banks and commercial banks for excessive credit growth driven financial upswings, which turn out unsustainable in the longer term.

We have shown that Keynesian economic theory provides appropriate tools to stabilize financial markets and real economic activity in the face of crisis, as proven in the case of the US subprime crisis as well as the European financial and debt crisis. The comparison between the financial stabilization measures of the Federal Reserve System and the European System of Central Banks has revealed, however, that the measures taken in the United States were more suited to stabilize the financial sector, as they incorporated the removal of bad assets from the banking system and indirect recapitalization. In contrast, the financial stabilization measures in the euro area were targeting more the stabilization of sovereign debt affordability, leaving bad assets in the banks and further weakening the banks by negative interest rates on their excess reserves. In addition, the policy mix of expansionary monetary policy and restrictive fiscal policies in the euro area constituted a drag on growth.

It was further shown, that the financial regulation linked to the monetary expansion has on one side prevented banks from new risk taking. On the other side, persistently low interest rates have destabilized banks in the euro area and have encouraged risk taking in the enterprise sectors of the US and euro area, inter alia in form of costly leveraged buy-outs and stock buy-back programs. The strong growth of corporate debt can be seen as a kind of shadow banking sector, which has created new risks for economic stability.

The economic policy implication is that monetary expansion as an instrument for financial stabilization has only limited effectiveness, as it helps to stabilize financial markets in the short-term, but contributes to the emergence of new risks in the longer-term for two reasons. First, during the upswing most financial indicators look sound, thereby providing incentives for financial supervisors not to lean against the wind. Second, the regulation of one sector of the economy leads to regulatory arbitrage and the emergence of new risks in other non-regulated sectors of the economy. Therefore, in the long-term a gradual monetary tightening is inevitable to ensure a sustainable degree of financial stability.

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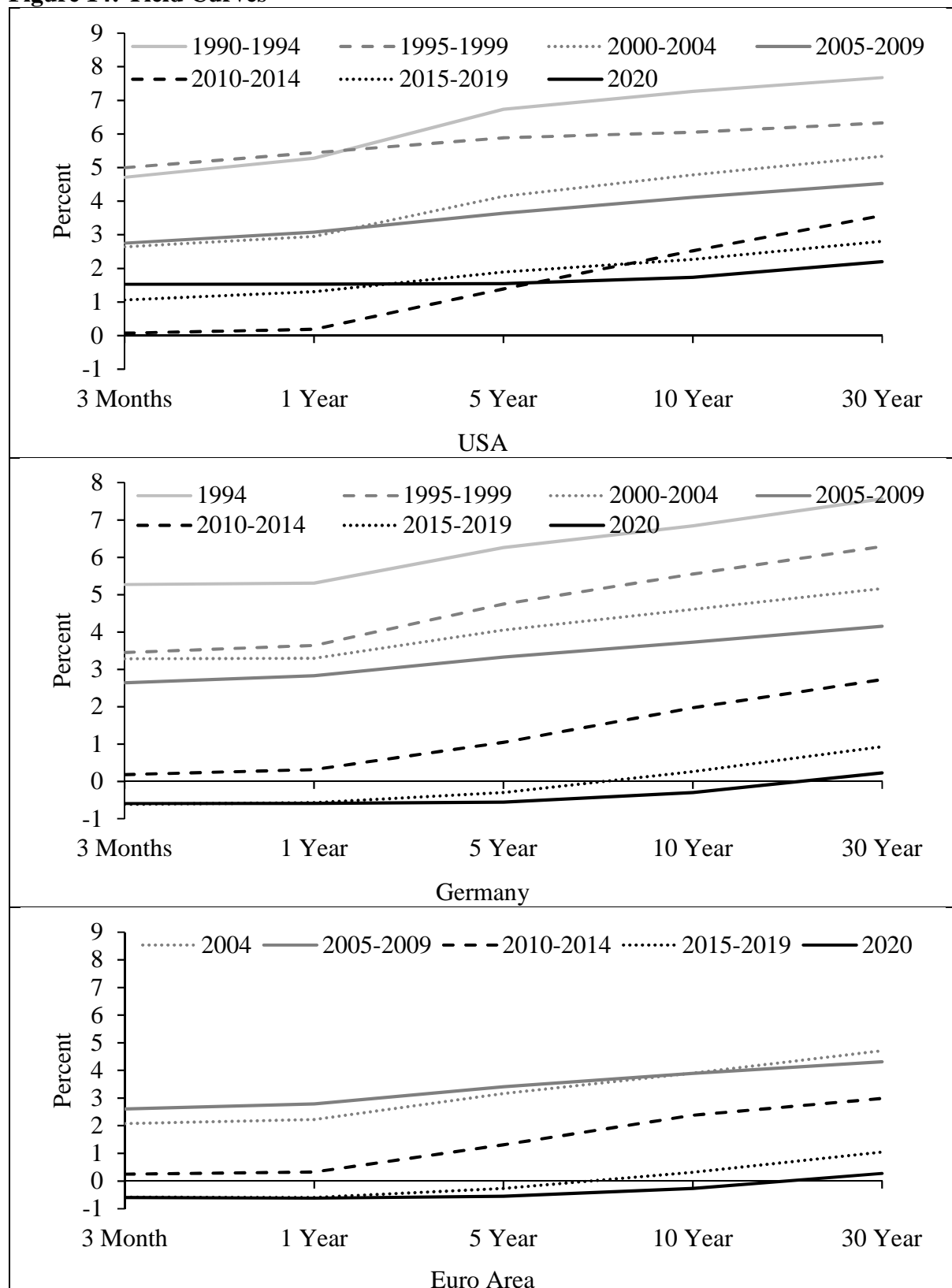
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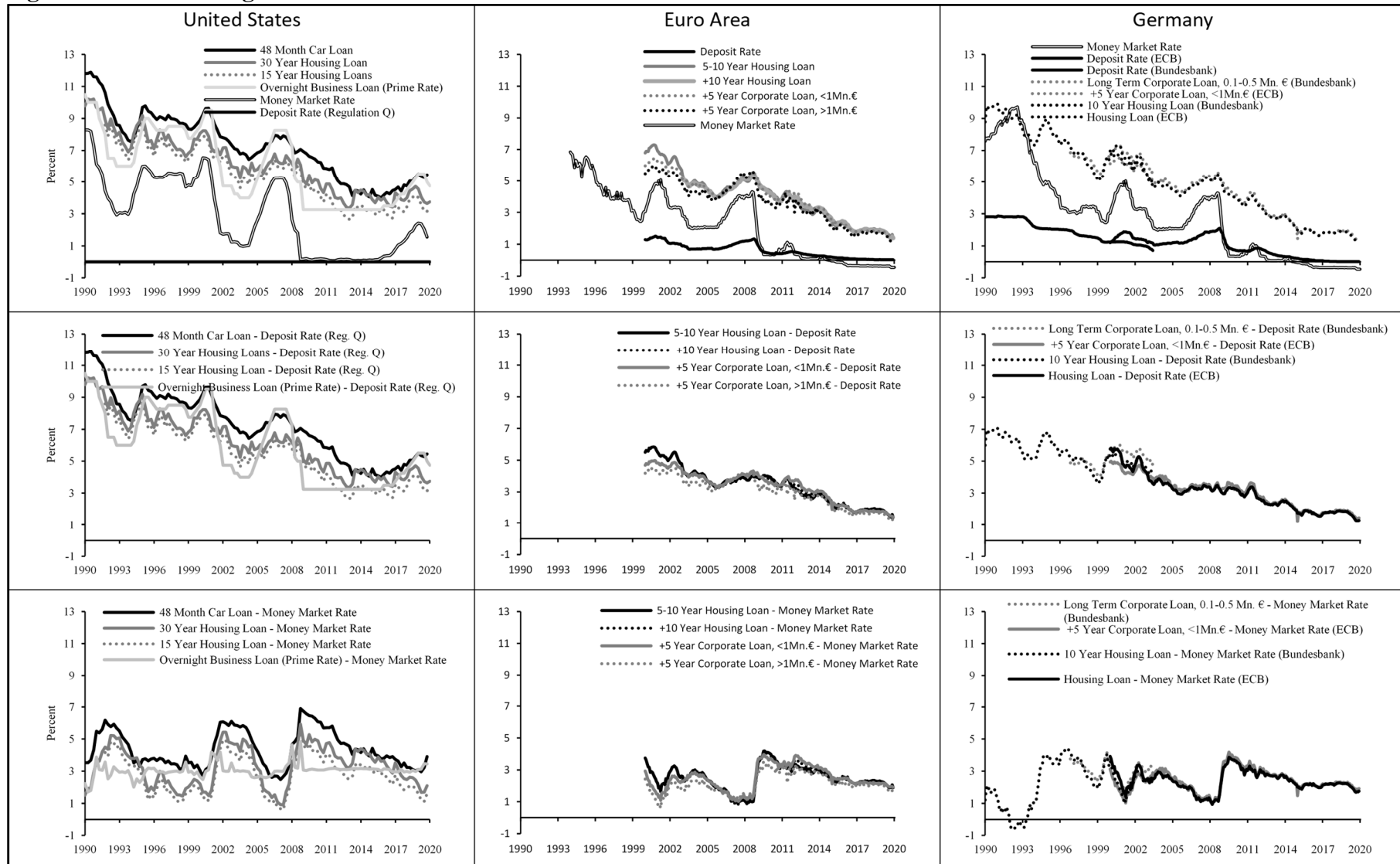
Appendix:

Figure 14: Yield Curves



Source: US Treasury, Thompson Reuters. AAA ratings.

Figure 15: Credit Margins



Source: Board of Governors of the Federal Reserve System, Freddie Mac, European Central Bank, Bundesbank, OECD.

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