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"The impact of European Central Bank's Quantitative Easing on Fair Value in the Banking Industry"

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1. ABSTRACT

The goal of the thesis is to investigate how banks account for government bonds in their financial statements during different time ranges characterized by various bond yields. A literature and theory review was conducted in order to understand the state of art on this topic and what has already been done by economists. The analysis was conducted using a dataset composed of N banks from European countries and the period considered is of 4 years (2016-2019) split into quarters for a total of 16-time observations for each bank. The choice of considering quarter financial data allows to better study the phenomenon. Once the impact of the bounds yield on regulatory capital was explained, the main finding is to give evidence of how banks act according to the level of spread.

2. Research problem

2.1 Research Question: What are the impacts of the European Central Bank's Quantitative Easing on Fair Value in the Banking Industry?

The purpose of this analysis is to investigate the effects of quantitative easing on fair value in the banking industry. Therefore, the theoretical aspects of quantitative easing and the accounting standards which allow banks to value the securities on their balance sheets at market value will be analyzed.

2.2 Working Questions

What are the impacts of the Quantitative Easing Policy and IFRS 9 on the banking industry?

To answer this research question and reach a better understanding of this topic, we need to realise the two following steps. First, we'll try to understand which are the effects of monetary policies bound to IFRS9 on the banking industry, from both a theoretical and practical point of view. We'll then analyse a sample of banks to understand how different institutions behaved over different periods.

Spreads and Government Bond Yields affect Regulatory Capital?

Following the impact of QE on the economy and, in particular, on interest rates and government bond yields, we'll try to explain how it can influence regulatory capital and which consequences banks might face. To solve this question, a thorough analysis of QE's economic theory will be needed. After having answered this question, explaining the results of the empirical analysis conducted on the banks' sample will get much easier.

3. Theory

3.1 Quantitative easing

3.1.1 Introduction

In this part of the thesis, two theoretical aspects will be presented to allow anyone to understand the objective of the empirical analysis.

The two aspects that will be illustrated are:

- 1. The Quantitative easing Policy and;
- 2. The IFRS 9 accounting standard.

The characteristics, objectives and accounting aspects of the ECB's quantitative easing will be presented. The main effects on economic variables, the financial system and the real economy will be illustrated. For the IFRS 9 accounting standard, the structure and in particular the methods of classification and measurement of financial assets, the new impairment model and hedge accounting will be presented.

Reading this theoretical part carefully is essential to understand how monetary policies and the accounting standard with the consequent fair value accounting affect the banking sector. These two aspects will be united in the empirical part of the thesis.

3.1.2 Conventional Monetary Policies

The European Central Bank is the institution responsible for implementing monetary policy for the countries that have joined the Euro area. Its main objective is to ensure price stability in the medium term, thereby promoting employment growth. It aims also to maintain inflation rates below, but close, to 2% over the medium term. In order to achieve its objective, the *European* Central Bank has a set of conventional monetary policy instruments. In detail, the European central bank:

- 1. Conducts open market operations;
- 2. Offers standing facilities;
- 3. Requires credit institutions to hold a minimum reserve on accounts with the ECB.

Let's briefly explain these three types of conventional monetary policy instruments.

Open market operations

There are four categories of open market operations:

1. Main refinancing operations (MROs): this expression refers to liquidity-providing operations that are conducted on a weekly basis with a maturity of one week. These operations are executed in the form of standard tenders. Standard because they are

conducted in accordance with a pre-announced schedule. All counterparts fulfilling general eligible criteria may participate in these operations.

- 2. Longer-term refinancing operations (LTROs): are operations aimed at providing liquidity to the banking system for a longer period than MROs. LTROs are executed every month with a 3-months maturity. Like the MROs, also LTROs are conducted as standard tenders. They are useful in order to prevent all the liquidity in the money market from having to be rolled over each week and to give counterparts access to longer-term refinancing.
- 3. Fine-tuning operations (FTOs): ECB can also use "customized" operations, i.e. Fine-tuning operations. Indeed, the frequency and the maturity of such operations are not standardized, they can be liquidity-providing or liquidity-absorbing. FTOs are aimed at managing the liquidity situation in the market in particular to smooth the effect on interest rates of unexpected liquidity fluctuations in the market. FTOs are normally executed through "quick" tenders, these take one hour from their announcement to the communication of the results.
- 4. Structural operations: these are those operations executed at the initiative of the European Central Bank in order to adjust the amount of liquidity in the market over the long term. Structural operations can be liquidity-providing or liquidity-absorbing, their frequency can be regular or not regular.

Standing Facility

Standing facilities are used to provide or absorb liquidity with an overnight maturity on the initiative of counterparties. There are two categories of standing facilities:

- 1. The marginal lending facility: banks use marginal lending facilities to obtain overnight liquidity from national central banks at a pre-established interest rate. Banks use them to satisfy temporary liquidity needs.
- 2. The deposit facility: banks use deposit facilities to make overnight deposits with national central banks. Deposits are remunerated at a pre-established interest rate.

However, in normal circumstances, banks have little incentives to use standing facilities because the interest rate applied to them are normally unfavourable when compared to interest rates available in the market.

Under normal conditions, these instruments are enough to achieve the central bank's objectives and influence interest rates. During periods of financial crisis, however, these instruments can be ineffective and it becomes complicated for the central bank to transmit monetary policy. The 2008 financial crisis and the collapse of Lehman Brothers had a huge impact on the economy, causing market instability, government intervention to prevent other banks from defaulting, worsening expectations for future economic growth, increasing sovereign debt and widening spreads. In this context, the ECB has announced for several years continuous cuts in key interest rates with the aim of giving an inflationary boost to the economy. By cutting rates, the central bank is trying to encourage companies to borrow money to finance investments. It also reduces the incentive for households to save in order to consume more in the future. An increase in aggregate demand should be noted with a consequent increase in prices. However, long rate cuts (until they were close to zero or even negative) did not deliver the desired results, unemployment was at very high levels, the sovereign debt crisis broke out and banks used very strict criteria for lending. Interest rates were close to zero or negative (Zero lower Bound) and the ECB in this situation was no longer able to oppose the reduction of inflation through interest rate cuts. There was nothing left to do other than adopt unconventional monetary policies. In March 2015 Mario Draghi announced the "Monetary Bazooka", the launch of the Quantitative Easing.

3.1.3 Unconventional monetary policies: Quantitative Easing

Quantitative easing (QE) is an unconventional monetary policy also adopted by the European Central Bank. Before the ECB this policy had been adopted by the Bank of Japan, the Federal Reserve and the British central bank. These past experiences will not be treated individually, the focus will be on the effects of QE

The QE is a mechanism through which the central bank purchases financial assets in exchange for currency reserves from the Central Bank itself. Thus, from an accounting point of view, there is an expansion in the Central Bank's balance sheet: on the assets side, there is an increase in the financial assets purchased, on the liabilities side there is an increase in the reserves held with it. While for the individual banks the consequence is a replacement of financial assets with medium-long term maturity by other highly liquid assets: the Central Bank's reserves.

Direct effects

Replacement caused by quantitative easing has three direct effects

- 1. On prices and returns of financial assets;
- 2. On money market interest rates;
- 3. On inflation expectations and the trust climate of households and businesses.

The first effect of this programme is the impact on the yields of the securities purchased. A security with maturity t_{+n} pays an interest rate $i_{t;t+n}^{1}$, this yield is determined by two components:

- 1. a risk-free component $i^{RF}_{t;t+n^2}$; and
- 2. a risk premium.

The risk-free component can be written as an average between:

- Current short-term risk-free rates;
- Expected short-term risk-free rates.

The extended securities purchase programme obviously marks the Central Bank's intention to maintain favourable and accommodating market conditions for the future. Investors, therefore, expect low-interest rates in the future. The low expectations are due to the fact that if the central bank decides to raise interest rates it will incur losses on financial assets held on the balance sheet and will have to pay higher interest on reserves held. As a result, expectations of future interest rates are revised downwards and the risk-free component is reduced ($i^{RF}_{t,t+n}$). *Signaling channel*.

The programme for the purchase of financial instruments also generates a reduction in the second component of the return, the risk premium. The risk premium is an extra return to encourage investors to buy a riskier security. It includes the liquidity risk premium and the credit risk premium³. The Central Bank, by purchasing medium to long-term securities, increases demand for these financial activities. As demand increases, it becomes easier to sell them at a fair price and, as a result, the liquidity risk is reduced. In addition, a reduction in the financial assets available on the market leads to a reduction in the return that investors are willing to obtain. For example, institutional investors may want to hold a fixed amount of government bonds with a 10-year maturity. The ECB purchases 10-year securities, other securities with different maturities are not perfect substitutes. Therefore, a reduction in the

¹ It pays for an interest rate calculated over the period of time going from "t" to "t+n"

² "Risk-free" interest rate calculated over the period of time going from "t" to "t+n"

³ "Liquidity risk" refers to the risk of not being able to sell a security for a fair price, with low transitional costs and in a short period.

[&]quot;Credit risk" is the possibility of a loss due to the issuer's failure to meet his payment obligations. Source: Glossario Borsaltaliana.

number of securities with a particular maturity generates a shortage of that security with a consequent increase in price and reduction in yield. *Scarcity channel*.

The second effect is on money market interest rates. The effect is very simple but in order to understand it is necessary to make a premise and explain how the interest rate corridor regime works. In a corridor system the central bank sets three interest rates:

- Upper limit, which is the interest rate at which banks may refinance themselves with the central bank through open market operations;
- Interest rate on the marginal lending facility, i.e. the rate at which banks request overnight liquidity directly from the central bank;
- Lower limit, which is the interest rate on overnight deposits, i.e. the rate that banks obtain on liquidity in excess of minimum reserves.

It has already been explained how quantitative easing generates a replacement of financial assets with central bank reserves. These reserves exceed the normal liquidity needs of the banking system. When, in an interest rate corridor system, there is excess liquidity, money market interest rates tend to the lower limit of the corridor: overnight deposit rates. Thus, a central bank's securities purchase programme generates excess liquidity and lower money market rates. *Excess liquidity channel*⁴.

The third effect that the central bank expects to obtain from a securities purchase programme is a positive impact on inflation expectations and an improvement in the confidence level of households and businesses. Obviously, an announcement by the ECB that it wants to adopt an accommodating monetary policy that aims at price stability in the medium term generates expectations from investors moving in the same direction. The more credible the announcement is, the stronger the measures taken and the greater the impact on inflation expectations and confidence. *Confidence channel*.

Those just described represent the direct effects of the EQ policy, which in turn generate indirect effects:

- 1. On the financial system; and
- 2. On the real economy.

Effects on the financial system

The main effects that the EQ policy has on the financial system are:

1. Reduction in returns on other financial assets (*Portfolio-balance Channel*): it has already been explained how the purchase of securities by the CB reduces both the risk-free component and the risk premium generating a price increase for the assets

⁴ In a context characterised by low or negative interest rates (zero lower bound), this effect might be limited.

purchased in the programme. Studies carried out in the United States⁵ show how financial institutions tend to rebalance their portfolios and replace assets purchased in the programme with securities with similar characteristics. As a result, these newly purchased securities have the same effect as described above, an increase in price and a reduction in yield. Moreover, more simply, it is the theory of the Capital asset pricing model⁶ which makes it possible to understand how a reduction in risk-free returns generates a decrease in all returns on assets on the market.

- 2. increase in bank loans (*Bank landing channel*): banks apply a rate on loans to households and businesses that depends on money market rates. It has been widely explained how the QE reduces money market rates and consequently also those on new loans granted by banks. As a consequence, households and businesses should be incentivised to ask for money. In particular, the Bank of Italy has estimated the effect of the QE in a decrease of about 20 basis points for loans to businesses, while for loans to households, a reduction of 35 basis points⁷. These estimates apply to both fixed-rate and variable-rate loans. The former certainly benefited most from the drop in medium/long-term rates. The latter, on the other hand, suffered a reduction in cost as a result of the increase in bank liquidity. The latter effect was rather limited because banks used excess liquidity to restore their balance sheets after a severe economic crisis. In addition, banks imposed much stricter requirements to obtain loans.
- 3. On exchange rates (*exchange rate channel*): also in this case it is the effect of a decrease in interest rates that indirectly causes a depreciation of the currency. In fact, we know from the theory of interest rate parity that a reduction in national interest rates shifts investors' preferences towards foreign currency assets. This is because they are attracted by higher yields. An outflow of capital and a consequent increase in demand for foreign currency generates an increase in the exchange rate and therefore a depreciation of the domestic currency. Empirical evidence shows that long-term government bond purchase programmes have a strong impact on the exchange rate of national currencies. Fratzscher (2013) concludes that about one-third of the depreciation of the dollar between 2007 and 2011 is caused by Federal Reserve policies. However, in its analysis, Fraztzscher observes different impacts as a result of buying programs. The first, QE1, generated an appreciation of the dollar as a result of the strong inflow of capital from

⁵ J. Gagnon, M. Raskin, J. Remache, B. Sack (2011) : "The Financial Market Effects of the Federal Reserve's Large-Scale Asset Purchases"

⁶ Ke=Rf+(Rm-Rf)*Beta; by reducing the "risk-free" component we reduce the equity cost as well

⁷ G. Talamao, F. Di Stefano: "Quantitative Easing in Europa: Funzionamento ed effetti per l'economia italiana".

emerging countries. The second, QE2 led to a depreciation of the dollar as a result of the strong outflow of capital. Overall, however, the depreciation was higher⁸.

4. On the balances of public finance (*Government budget channel*): this is perhaps the effect of easy to understand, a decrease in interest rates generates a lower outlay by public finance to pay interest on sovereign debt.

Effects on the real economy

Changes in long-term interest rates and the consequent transmission through the financial system and in particular the effect on bank credit influence the decisions of households and businesses. The reduction in yields generates an intertemporal substitution effect, households are incentivised to save less and consume more. For households, the utility of consuming an additional unit of income today increases and this utility is greater than if they would save the additional unit of income to consume it in the future. Even if businesses have bank credit available on more favourable terms, the real cost of an additional unit of capital is reduced. This should encourage enterprises to invest. The effect of an increase in household consumption and investment by enterprises is to push up aggregate demand.

The depreciation of the currency also makes domestic products relatively cheaper than those offered by foreign competitors.

3.2 IFRS 9

3.2.1 Introduction & overview of IFRS 9

As a consequence of the 2008 financial crisis, many members of the G20 and other international financial institutions requested the International Accounting Standards Board (IASB) to modify the accounting rules of IAS 39. They called for clear standards in order to reduce the impact of financial crises on banks' financial statements and to improve the quality of the information contained therein.

In 2014, the IASB's long review process was completed with the issuance of the final version of IFRS 9. The purpose of this standard is to provide rules for the presentation of financial assets and liabilities in the financial statements. This new way of representing financial assets provides investors with useful and significant information to better evaluate the amounts. IFRS 9 is divided into the following chapters:

- 1. Objective;
- 2. Scope;

⁸ For further details see: M. Fratzscher; M. Lo Duca; R. Straub (2013): " On the international spillovers of US Quantitative Easing".

- 3. Recognition and derecognition;
- 4. Classification;
- 5. Measurement;
- 6. Hedge Accounting;
- 7. Effective date and transition⁹.

Appendix A contains definitions of terms and Appendix B is an operational guide. Before explaining all of the accounting standards' rules, it is important to specify that the scope of application has remained virtually unchanged from IAS 39's. Moreover, IFRS 9 applies to all financial instruments except for:

- a) Investments in subsidiaries, associates and joint ventures that have been accounted for in accordance with IFRS 10;
- b) Rights and obligations under leases to which IFRS 17 applies
- c) Employers' rights and obligations under employee benefit plans, to which IAS 19 applies;
- d) Financial instruments that meet the definition contained in IAS 32 Equity Instruments;
- e) Rights and obligations arising under an insurance contract or a contract within the scope of IFRS 4;
- f) Any forward contract between an acquirer and a seller that will result in a business combination in the future and is therefore within the scope of IFRS 3;
- g) Loan commitments;
- h) Share-based payment financial instruments to which IFRS 2 applies;
- i) An entity's rights to be reimbursed for expenses incurred in settling a liability are defined in IAS 37;
- i) Rights and obligations within the scope of IFRS 15^{10} .

As already mentioned, the scope of application remained practically the same as IAS 39's one. The only difference is due to Impairment reasons in order to incorporate in the application of the impairment test also loan commitments.

⁹ IFRS 9: INDEX ¹⁰ IFRS9: par. 2.1

3.2.2 Classification and measurement of financial instruments

One of the main new features of the IFRS 9 is the introduction of new accounting categories and new classification methods for financial assets. The accounting standard simply states that a financial asset must be classified at amortised cost or fair value. With reference to the accounting classes, all financial assets must be classified among:

- 1. Financial instrument at Amortized cost;
- 2. Financial instrument at Fair value through Other Comprehensive Income;
- 3. Financial Instrument at Fair Value through Profit & Loss

The classification in one of the two classes is based on the following elements:

- 1. The entity's business model for the management of financial assets;
- 2. The characteristics of the contractual cash flows of the asset ¹¹.

Paragraph 4.1.2 of IFRS 9 describes the conditions that must be met in order to classify a financial instrument as one at amortised cost. In particular, a financial asset is measured at amortised cost if both of the following conditions are met:

- 1. the asset is held within a business model whose objective is to hold assets in order to collect contractual cash flows; and
- 2. The contractual terms of the financial instrument give rise to cash flows that refer only to the payment of principal and interest.

On the contrary, paragraph 4.1.2A states that Financial assets are classified at Fair Value through other comprehensive income if:

- 1. They are held in a business model whose objective is achieved by both collecting contractual cash flow and selling financial assets; and
- 2. As for amortized cost, the contractual terms of the financial asset give rise to cash flows that are solely payments of principal and interest.

Finally, if a financial asset cannot be measured either at amortised cost or at fair value through other comprehensive income, paragraph 4.1.4 states that the financial instrument must be measured at fair value through profit and losses. This is called the "fair value option", i.e. the possibility to designate at initial recognition a financial asset as an instrument measured at fair value through profit and losses. The choice is however irrevocable and can be made only to eliminate accounting mismatches.

Two types of tests are needed to understand how a financial asset should be classified:

1. Business model Test

¹¹ IFRS 9: par. 4.1.1

2. SPPI test.

Business model test

In the application guidance of IFRS 9 (paragraph B4.1.2) it is specified that the business model does not concern the individual financial instrument but the choice that reflects the way the entity wants to collectively manage groups of financial assets (portfolios) to generate cash flows. The business model is therefore determined by the intention of a financial institution to hold a portfolio of assets to:

- A) receive only contractual cash flows (business model "hold to collect"),
- B) collect sale cash flows in addition to the contractual ones (business model "hold to collect and sell"), or
- C) put in place other business strategies, such as only receiving cash flows deriving from sales ("other").

The business model used to manage an activity is a fact, which can be determined by looking at the activities that an institution carries out to achieve the objective of the business model. Therefore, as set out in Appendix B (paragraph B4.1.2B), the entity must assess its business model for managing financial assets based on the following probatory elements:

- a) Methods for evaluating and communicating the performance of the business model and the activities held within that model. For example, if the portfolio valuations are based on the overall returns generated, we'll be clearly in front of a "hold to collect" business model; on the contrary, if the performance is based on changes in the value of the securities portfolio, we'll be in front of a "held for trading" portfolio;
- b) The risks affecting the performance of financial assets and how the entity intends to manage those risks. For example, if the main risk of a portfolio is credit risk¹², the business model will be easily identified as "hold to collect". In contrast, if the main risk is a price risk, we'll be dealing with a business model held for trading.
- c) Management's remuneration methods. Indeed, a model will be classified as "held for trading business model" if the remuneration is based on the value of the instrument and, therefore, on the presence of bonuses in case of portfolio appreciation (depreciation).

The following table summarizes the two types of business models illustrated in the accounting standard:

¹² Credit risk is the risk of not receiving all interest payments and repayment of capital – definition from www.borsaitaliana.it

Type of securities portfolio management	Business model
Portfolios held to collect contractual cash flows	Hold to collect
Portfolios held to collect both contractual and sale cash flows	Hold to collect and sell
Portfolios held neither to collect cash flows nor to sell them	Other business models. E.g., Held for trading

Table 1: "Type of securites and Business Model". Source: Personal processing

The portfolios that are held with the intention of collecting the contractual cash flows of the financial instruments contained in them are part of the "Hold to collect" business model. However, the same accounting standard states that these portfolios can still be classified as "Hold to collect" in case of future sales (even if only presumed). These sales can therefore be consistent with a "hold to collect" business model as long as they are either occasional (even if significant in terms of value), irrelevant in terms of value or if they occurred as a result of an increase in credit risk (which is determined by considering reasonable and demonstrable information only). The credit risk obviously affects the entity's ability to collect the contractual cash flows and, due to this reason, sales are compatible with a "hold to collect" business model. In any case, the institution must always justify the reasons for such sales¹³.

An example can be helpful to further clarify what was just exposed. Imagine that an entity has investments to raise the contractual cash flows and plans to hold them to maturity. For this purpose, it uses a credit risk management policy designed to minimise credit losses. Performance evaluations and remunerations focus on the credit quality of assets. In this context, sales are compatible with a hold to collect business model due to the increased credit risk, as the previous assets no longer meet the criteria set out in the entity's investment policy.

SPPI test - Solely payments of principal and interest

The second criteria of Ifrs 9 for determining whether a financial asset should be measured at amortised cost or at fair value through other comprehensive income concerns the cash flow characteristics¹⁴. They must be represented exclusively by the repayment of the principal and

¹³ IFRS 9: par. from B4.1.2C to B4.1.3B

¹⁴ IFRS 9: par. 4.1.1

the payment of interest calculated on the remaining capital¹⁵. In paragraph B4.1.7B, "capital" is described as the fair value of the financial asset at initial recognition and it is variable over time, while "interest" represents the remuneration for the time value of money and credit risk. Interest may also include compensation for other risks and costs (e.g. liquidity risk and administrative costs).

If a financial asset generates cash flows that are not only represented by the repayment of principal and interest, it does not pass the SPPI test. In this case, it must be measured at fair value through Profit & Losses, regardless of the Business model.

However, there may be additional contractual clauses that modify cash flows. The point is, therefore, to identify the contractual terms that generate cash flows and are not exclusively the repayment of principal and interest. The same accounting standard, in paragraph B4.1.9, states that financial instruments characterised by the leverage effect are incompatible with the definition of capital and interest generators. This is because the leverage effect increases its volatility. For example, non-standard interest rates (2xEuribor + spread), options, forward, swaps and all derivative contracts are examples of contracts that generate a failure of the SPPI test.

Again, some examples will be useful to better understand.

A loan that pays an interest rate that is inversely proportional to market rates does not generate cash flows that are exclusively the repayment of principal and interest. In particular, the interest is not a consideration for the time value of the money.

More simply, a bond convertible into a share generates a return that depends on the equity value of the issuer and therefore on performance elements.

These are two simple examples of financial instruments that pay interest but do not represent a premium for the mere passage of time (example 1) or for credit risk (example 2).

As already mentioned above, a fundamental component of interest is the remuneration for the mere passage of time, the so-called "Time of value money". To evaluate this component, the entity must use its own judgement and consider elements such as the currency of the asset and the period for which the interest rate has been fixed¹⁶. There are some cases where the time of value money is imperfect. This happens when the relationship between interest rate and the passage of time is not perfect. Again, some examples are reported in the same accounting policy, in paragraph B4.1.9B. For instance, if the interest rate is reset to zero and revised monthly but based on an annual interest rate, the relationship between rate and time is imperfect. In situations like the latter, the institution holding such instruments must compare it with other

¹⁵ IFRS 9: par. 4.1.2 and 4.1.2A

¹⁶ IFRS 9: par. B4.1.9A,

instruments having the same characteristics but whose rate is recalculated monthly based on a monthly interest rate. If the comparison shows substantial differences in cash flows, the instrument fails the SPPI test and must be measured at fair value through other comprehensive income.

The following scheme summarizes and simplifies the classification methods provided by Ifrs 9 considering the two tests just described:



Figure 1: "IFRS 9 – Financial instruments classiciation"; source: "Accounting for Financial Instrument and institution; lesion 5; A. Parbonetti.

3.2.3 Reclassification of financial assets

After having described how financial assets are classified, it is now essential, for the purposes of my analysis, to explain the methods of reclassification provided by the accounting standard. With regards to the reclassification procedures, the accounting principle is very clear. Indeed, paragraph 4.4.1 states that: "a financial institution can only reclassify its assets when its business model changes". Moreover, the section B4.4.1 of the Operating Guide clarify that such changes should occur "very rarely", and that they must be material and demonstrable to third parties. The accounting standard goes on explaining that a business model can be modified "only in the event of the commencement or termination of a relevant activity". The acquisition, sale or disposal of a line of business are examples of this.

Suppose a financial institution has a portfolio of commercial loans. These loans are held in a business model aimed at collecting contractual cash flows and for sale ("hold to collect and sell"). However, the financial institution acquires another company whose business model is based on holding the loan portfolio to collect the contractual cash flows ("hold to collect"). In this case, the portfolio is no longer held for sale and justifies a reclassification among the instruments measured at amortised cost. The reclassification must also take place at a later date, after the change in the business model.

A key concept for my analysis can be found in paragraph B4.4.3 of the operational guide of the IFRS 9, which establishes some situations that do not represent business model changes and, therefore, do not justify a reclassification of financial assets. In particular, the following situations do not represent changes in the business model:

- a) A change in intention related to the method of managing certain financial assets (even in circumstances of significant changes in market conditions);
- b) The temporary extinction of a given market for financial assets;
- c) a transfer of financial assets between parts of the entity with different business models.

3.2.4 Impairment test

One of the most important aspects introduced by IFRS 9 concerns the impairment of financial assets. Indeed, a new impairment test model is introduced.

In fact, IAS 39 – the previous accounting standard – had been strongly criticised because it provided an impairment model based exclusively on incurring credit losses. In fact, it provided recognition of losses only when they were incurred, which means only when there was evidence of loss. Obviously, this generated a delay both in the recognition and in the external communication of losses. This was one of the reasons that caused the financial crisis. Indeed, institutions were unable to cover the huge losses which were arising without previously created reserves.

In response to these severe criticisms, the IASB decided to modify this model, moving from an incurred credit loss to an expected credit loss model. The guiding principle of the expected credit loss model reflects the general pattern of deterioration or improvement in the credit quality of financial instruments. In order to determine possible losses, an institution must consider historical and actual information other than changes in the economic conditions of borrowers.

Under IFRS 9 the following financial instruments are included within the scope of impairment:

- Financial instruments measured at amortised cost;
- Financial instruments that are measured at fair value through other comprehensive income.

IFRS 9 establishes a three-stage impairment model, based on whether there has been a significant increase in the credit risk of a financial asset since its initial recognition.

- Stage 1: credit risk has not increased significantly since initial recognition; recognise 12 months expected credit losses and interest are determined on a gross basis;
- Stage 2: credit risk has increased significantly since initial recognition; recognise lifetime expected credit losses and interest are calculated on a gross basis;
- Stage 3: the financial instrument is credit-impaired; recognise the lifetime expected credit losses and interests are calculated on a net basis.

In the first stage, the 12-months expected credit losses are calculated by multiplying the probability of default occurring in the next 12 months by the lifetime expected credit losses that would result from that default. Therefore, the 12-months expected credit losses represent a financial asset's lifetime expected credit losses that are expected to arise from default events that are possible within the 12 months period following the origination of an asset, or from each reporting date for those assets in Stage 1.

When an increase in credit risk occurs, there is a transition from stage 1 to stage 2. The focus is on the increase in the credit risk and not on the changes in the amount of expected credit losses. For example, if a financial institution is in a country affected by a recession in its local economy, its loans move from stage 1 to stage 2. This translation occurs also if the entity is highly collateralized and the expected losses are extremely low and near to zero.

In the following lists there are examples of events that generate a significant increase in credit risk:

- Changes in general economic and/or market conditions (e.g. expected increase in unemployment rates, interest rates);
- Significant changes in the operating results or financial position of the borrower;
- Changes in the amount of financial support available to an entity (e.g. from its parent);
- Expected or potential breaches of covenants;
- Expected delay in payment.

In order to enter the third stage, IFRS 9 states that evidence of impairment is required. A financial asset is credit-impaired when one or more events that have a detrimental impact on the estimated future cash flow of the financial asset have occurred. Therefore, in Stage 3 are included all the financial instruments for which observable information and data are available that highlight a loss for the entity. Appendix A of the accounting standard identifies the events that constitute proof of the financial asset deterioration:

- a) Significant Financial Difficulty of the issuer or the borrower
- b) A Breach of Contract, such as a default or Past Due event
- c) The lender(s) of the borrower, for economic or contractual reasons relating to the borrower's financial difficulty, having granted to the borrower a concession(s) that the lender(s) would not otherwise consider
- d) It is becoming probable that the borrower will enter bankruptcy or other financial reorganization
- e) The disappearance of an active market for that financial asset because of financial difficulties
- f) The purchase or origination of a financial asset at a deep discount that reflects the incurred Credit Loss

An example provides a better understanding of the impairment model required by IFRS 9.

Let us consider the following situation:

On January Year 1, a bank provides a loan of notional $100 \in$ to a company for four years at an annual interest rate set at 10%. At the end of year 2 (31/12/Y2) the origin country of the

company faces a deterioration in its general economic condition. The company is expected to have problems in future cash flows. At the end of year 3, the company does not have enough cash to repay the loan, thus the bank decides to extend the loan for another three years. What happens from an accounting point of view considering the three-stage expected credit losses model?

At 31/12/Y1 the loan is in stage 1, the bank estimates the probability that the company will default over the next 12 months. Assume that there is a 1% of probability that a default event will occur in the next 12 months. If the event really occurs, the bank will not get any amount back. The Bank recognizes a provision per credit loss equal to 1%*100. Interests are recognized on a gross basis so 10%*100.

On 31/12/Y2, considering the worsening economic condition and expected problems in future cash flows, the loan is in stage 2. There is a significant increase in credit risk. The Bank estimates a 35% probability that the company will default over the remaining life of the loans. It recognizes a provision equal to 35%*100. Therefore, it continues to recognize interests on the gross carrying amount of the loan (10%*100).

On 31/12/Y3 the company is in financial difficulty, it is unable to repay the loan and needs an extension of the loans for another three years. These elements represent evidence of loss. The loan is therefore in stage 3 and it is credit-impaired. The probability of default over the remaining life of the loan is 60%. Remembering that if there is a default there will be a 100% loss the Bank recognises a provision for credit loss of $60 \in (60\%*100 \in)$. The loan is credit-impaired and its carrying amount is now $40 \in (100-60)$. From the beginning of the next reporting period, interests are calculated and recognised on the net carrying amount of the loan $10\%*40 \in$. The new accounting standard requires more write-downs and additions to the allowance for doubtful accounts. As mentioned above, a bank should not only write down a loan loss when there is evidence of loss but also when it is only expected. The objective is to ensure the presence of reserves to cover losses as they arise. A study by Ernest & Young shows that many banks have experienced a significant increase in loan loss provisions since the adoption of IFRS 9 (1 January 2018) compared to the previous year. [Fig. 2]





The name of the banks is not specified but it is clear that "IT Bank 2" increased its provision for loan loss by as much as \notin 4 billion in one year.

3.2.5 Hedge accounting

When carrying out their activity, entities, banks and companies are exposed to some risks (e.g. interest rate risk, exchange rate risk and so on). Nobody likes to undertake risks and therefore will try to minimize them. Entities do the same, implementing different risk management strategies to eliminate or reduce their risk exposure. Hedge accounting is a risk management strategy. It is a technique based on a matching principle that aims to eliminate or reduce the volatility in the statement of comprehensive income that otherwise would arise if the hedged item and the hedging instrument were accounted separately. So, it is a technique that modifies the normal basis for recognising gains and losses on associated hedging instruments and hedged items.

Under the IFRS 9, hedge accounting is optional, and banks should consider costs and benefits when deciding whether to use it or not. The accounting principle establishes three types of hedge relationships:

- 1. Fair value hedge;
- 2. Cash flow hedge;
- 3. Net investment hedge.

In the following paragraphs, I will explain how these strategies work and how to account for them.

Fair value hedge

Entities use a fair value hedge to eliminate or reduce a particular type of risk that generates a change in the fair value of an asset or liability or an unrecognised firm commitment. This change could affect the income statement (or other comprehensive income). Changes in fair value could arise for example from changes in the interest rates, the foreign exchange rate, the Equity prices or the commodity prices. Profit or loss of the hedging instrument has to adjust changes in the value of the hedged items. These fair value changes are recognised in the Profit & Loss statement. The IFRS 9 establishes that, only for equity instruments accounted at fair value through other comprehensive income, gains or losses of equity instruments are never recycled into Profit & losses statements. Moreover, also changes in the fair value of the hedging instrument are recorded in other comprehensive income without recycling to profit & losses.

Cash flow hedge

Some risks (like interest rate risk, exchange rate risk) might generate variability in the cash flows attributed to a recognised asset or liability, an unrecognised firm commitment or a highly probable forecast transaction that could affect profit and losses statement. IFRS 9 provides that when the hedge is effective, changes in the fair value of the hedging instrument are recognised in other comprehensive income. The ineffective portion of the change in the fair value of the

hedging instrument is recognised in the profit and loss statement. In particular, the amount recognised in other comprehensive income should be the lower of the cumulative gain or loss on the hedging instrument from the inception of the hedge, and the cumulative change in the fair value of the expected cash flows on the hedged items from the inception of the hedge.¹⁷ Considering this rule is fundamental to define the effectiveness of the hedging instrument exceeds the change in the hedged item (ineffectiveness duo to an over-hedge). If this is an under-hedge, so the cumulative change in the fair value of the hedged item, no effectiveness is recognised. This is different from a fair value hedge, in which both over and under hedges are recognised as ineffective.

For cash flow hedges of a forecast transaction which results in the recognition of a non-financial item (such as a fixed asset or inventory), or where a hedged forecast transaction for a non-financial asset or a non-financial liability becomes a firm commitment for which fair value hedge accounting is applied, the carrying value of that item must be adjusted for the accumulated gains or losses recognised directly in equity (often referred to as 'basis adjustment').

For cash flow hedges of a forecast transaction that results in the recognition of a financial asset or liability, the accumulated gains and losses recorded in equity should be reclassified to P&L in the same period or periods during which the hedged expected future cash flows affect P&L. Where there is a cumulative loss on the hedging instrument and it is no longer expected that the loss will be recovered, it must be immediately recognised in P&L.

Where the net position of a group of items containing offsetting risk positions is designated as the hedged item, the cash flow hedge model can only be applied to the hedge of foreign currency risk. The designation of that net position must specify both the reporting period in which the forecast transactions are expected to affect P&L and the nature and volume that are expected to affect P&L in each period.

Net investment hedge

An entity might of course have foreign branches, subsidiaries or joint ventures. In these cases, the parent company can face currency risk associated with the translation of the net assets of these foreign operations. This type of risk is hedged in a net investment hedge. IFRS 9 establishes that the foreign currency gains or losses on the hedging instrument are recognised in other comprehensive income if the hedge is effective. The ineffective part is recorded in $P\&L^{18}$.

¹⁷ IFRS 9 par. 6.5.11

¹⁸ IFRS 9: par. 6.5.13

IFRS 9 also establishes which hedging instruments and hedged items meet the eligibility criteria to be defined as such

Hedging Instruments

Under the IFRS 9, a derivative financial instrument at fair value through P&L can be a hedging instrument¹⁹. Also, non-derivative financial instruments can be hedging instruments provided that they are measured at fair value through profit and losses.²⁰. Nonetheless, there are two exceptions: the first one is for financial liabilities at fair value through profit & loss for which fair value changes in the liability's own credit risk are presented in other comprehensive income. The second one refers to non-derivative financial instruments that are an investment in equity instruments for which the entity has elected to present changes in fair value in other comprehensive income.

Almost all derivative instruments can therefore be hedging instruments as long as they are considered as such in their entirety. However, some components can be separated, as we will see later.

As said, most derivative financial instruments can be designed as hedging instruments. The derivatives are:

- Forwards contract: they are a customized (because they are treated on the over-thecounter market²¹) contract between two parties to buy or to sell an asset (underlying) at a specified price on a future date;
- Futures: they are forward contracts, but futures are standardized and treated in a regulated market;
- Options: options are contracts that give the right, but not the obligation, to buy (call option) or to sell (put option) the underlying at a pre-established price (strike price);
- Swaps: are contracts with which two parties decide to exchange sums of money according to the terms of the contract.

Once defined the main derivative instruments used for hedging purposes, it is possible to take a step back to understand the components of the derivative that can be accounted separately from the hedging instrument. Paragraph 6.2.4 of the IFRS 9 introduces the concept of Time value of the options. The fair value of an option is composed of two elements: the intrinsic value (which is the difference between the strike price and the current market price of the underlying) and the time value (which is the difference between the fair value of the option and

¹⁹ IFRS 9 : PAR. 6.2.1

²⁰ IFRS 9: PAR. 6.2.2

²¹ OTC markets are non-regulated market, whose main difference from the regulated ones lies in the absence of a central settlement body (clearing house)

its intrinsic value)²². The time value represents how much an investor is willing to pay beyond the intrinsic value. An investor is willing to pay more for a component that allows him to wait, to see how market conditions change and then to make a decision. The time value depends on the remaining life of the option, the volatility of the underlying asset and the risk-free interest rate. The IFRS 9 states that the intrinsic value and the time value can be separated and that the entity can designate as a hedging instrument only the intrinsic value of the option. Changes in time value are accounted for in other comprehensive income.

Moreover, the fair value of forward contracts is influenced by two elements: changes in the spot price (the price of the underlying) and changes in the forward price (mark-up to purchase the asset at a future date)²³. As with options, the accounting standard requires separating the forward and spot components and only changes in the forward price are considered as hedging elements²⁴.

Hedged items

The IFRS 9 has introduced several new features regarding the elements covered that meet the eligibility criteria. A recognised asset or liability, an unrecognised firm commitment, a forecast transaction (highly probable) or a net investment in foreign operations can all be defined as a hedged item. In addition, the hedged item may be:

- a) One single element or;
- b) A group of items (provided they are managed as a single exposure).

IFRS 9 also introduces the possibility to qualify a risk component²⁵ of the instrument (financial or not) as a hedged item. To be designated assuch, this risk component must be separately identifiable. In addition, changes in fair value (or cash flow) caused by this separately identifiable risk component must be measured reliably²⁶. These two aspects constitutethe eligibility criteria for the designation of a risk component as a hedged item.

These requirements can be met when the risk component is either explicitly stated in a contract (contractually specified) or implicit in the fair value or cash flows (non-contractually specified). For risk components that are not specified in a contract, the entity must analyse the market environment and assess how the risk affects the fair value of the hedged item. ²⁷

²² Glossario finanziario Borsa Italiana

 $^{^{23}}$ F₀=S₀*e^{rT}; where F₀ is the value at time 0 of the forward contract, it depends on S₀: spot price plus any costs. ²⁴ The forward price depends on the underlying, e.g. a forward contract for interest rate risk reflects the forward structure of interest rates; unlike the exchange rate risk, the forward price depends on the interest rate differential between currencies specified in a forward contract.

²⁵ IFRS 9: par. 6.3.1

²⁶ IFRS 9: par. B6.3.8

²⁷ IFRS 9 : par. B6.3.9 and par. B6.3.10

The following example allows a better understanding of what I've just described. An entity has a contract for the supply of natural gas, whose supply price is established using a contractually defined formula based mainly on the price of diesel oil and other elements (fuel oil, transport costs, etc.). The entity hedges the risk relating to changes in the price of diesel fuel with a forward contract. In this case, the risk related to the price of diesel fuel is contractually defined and given the existence of a formula based on different elements it is also separately identifiable. Moreover, a market for forward contracts does exist, with the consequence that the exposure to the oil price is measurable in a reliable way. The scenario just described sets an example of a risk component considered eligible as a hedged element.

Let's now suppose that another entity purchases fuel type Xand starts to cover purchases up to 24 months before delivery with different types of contract:

- From 12 to 24 months it uses hedging contracts based on crude oil;
- From 6 to 12 months it uses contracts based on diesel oil;
- Up to 6 months it uses fuel X contracts directly.

In this latter case, there is no supply contract with a formula that determines the price of fuel X basing on several factors. However, analysing the market, the entity can state that crude oil is the raw material of reference for the production of refined products and, therefore, it influences the price. The price of diesel is also a benchmark for refined oil products. The entity can then conclude that the price risk of crude oil and diesel have an impact on fuel purchases X. These risks are separately identifiable and can be reliably assessed, although not contractually defined²⁸.

²⁸ IFRS 9: par. B6.3.10

3.2.6 Differences with IAS 39

Since data collected in Chapter 3 (paragraph 3.2.6) of this thesis are between two accounting principles, in this paragraph I am going to clarify the methods of financial assets'

classification

IAS 39 is used to distinguish between the following classes:

- a) Financial instrument Held for trading: this category includes financial assets held for trading purposes. They are measured at fair value;
- b) Available for sale financial instrument: it is a residual category which means that it includes all the financial instruments that do not have the characteristics to be included in the other categories. Fair value measurement;
- c) Held to maturity Financial assets: this category includes all financial assets with fixed payments and fixed maturity. An asset is accounted for in this class if there is an intention to hold it to maturity. Measure at amortised cost.
- d) Loans and receivables: are instruments with characteristics similar to those present in the Held to maturity, they have fixed and predetermined payments. The difference is that loans to banks and individuals are included in this class. Measure at amortised cost.

The following table illustrates the link between the categories provided by the two accounting standards.

Ias 39	IFRS 9
Financial instrument Held for trading	FI at FVtP&L
Available for sale financial instrument	FI at FVtOCI
Held to maturity Financial assets	FI at AC
Loans and receivables	FI at AC

Table 2: "Financial instruments differences between Ias 39 end Ifrs 9". Source: Personal processing

This is a personal elaboration based on the reconciliation statements in the financial statements of the banks analysed and a report by the auditing firm PwC spa. The following images are examples.

nicredit		
IAS 39		IFRS 9
	00.49%	 10
	99,48% x =99.552%	 AC
Loans And Receivables	0.025%	EVOCI
Edulovina recontables	$\bar{x} = 0.006\%$	1 4 6 6 1
	0.49%	EVTPI
	$\overline{x} = 0.441\%$	
IAS 39		IFRS 9
	2,3%	AC
	<i>x</i> =15,27%	
Available For Sale	96,05%	FVOCI
	x =78,854%	
	1,65%	FVTPL
	<i>x</i> =5,876%	



Figure 3 and 4: "Porfolios Reclassification in first time adoption". Source: <u>https://www.ey.com/Publication/vwLUAssets/ey-ifrs-9-expected-credit-loss/\$File/ey-ifrs-9-expected-credit-loss.pdf</u>

4. Literature review

This part of the thesis is dedicated to the literature review and will be divided into three parts. Indeed, each part will be focused on one of the following fundamental topics:

- IFRS 9
- Fair value accounting
- Quantitative easing

The literature review contained in each one of these paragraphs was realised by carefully analysing academic papers, manuals and newspaper articles to get clear and proper information on the thesis' topic.

4.1 IFRS 9 effects on European Banks' Balance Sheet

In this paragraph, we will analyse the current literature on IFRS 9. We will first study the accounting aspects of IFSR 9 on banks' financial statements and then we will focus on the audit manuals of the four companies that make up the so-called "big four": PricewaterhouseCoopers (PwC), Ernst & Young, Deloitte and KPMG.

In the second part, we will study papers and publications issued by the authorities to understand IFRS's impact in terms of capital and ratios.

The audit guides that the four sister companies publish annually are very useful tools for understanding updates in accounting standards used to prepare financial statements. They also dwell on practical aspects and provide comments and interpretations as well as practical examples to clarify those passages that may seem ambiguous to the reader.

Our analysis considers a 4-year time period which goes from 2016 to 2019 with a particular focus on 2018-2019 when the IFRS 9 accounting standard came into force. For this reason, the 2018 and 2019 audit manuals were analysed. The key concepts that will be considered in this review are essentially two: the concept of business model and the concept of reclassification of financial assets.

EY²⁹ does not provide a clear definition or interjection of the business model in its audit report. However, if we read it carefully, we can notice that several comments are made about sales of financial instruments within a portfolio with a hold to collect business model (i.e. a portfolio that holds financial instruments with the objective to hold them until maturity to receive cash flows). It is therefore ambiguous whether it is possible to apply the same principle, namely

²⁹ Ernst & Young - International GGAP 2018, Volume 3, chapter 47, paragraph 5.2.1

whether financial instruments valued at amortized cost (and therefore held to obtain cash flows) can be sold. This can happen provided that the sales are infrequent and of insignificant value. According to EY "the standard is slightly cryptic concerning the role of sales". IFRS 9 only requires future-oriented sales decisions, although past sales can be relevant as evidence of selling's frequency and quantity. Therefore, EY holds that past sales represent the starting point to predict the future ones. However, the accounting standard doesn't provide any indication related to the value of those sales thresholds. Indeed, "IFRS 9 does not explain how 'infrequent' and 'insignificant in value' should be interpreted in practice. Overall, those thresholds could lead to diversity in application, although it is an area where we expect that consensus and best practices will emerge over time."

As a consequence, there's a fair risk that each company will interpret this standard in a discretional way. Moreover, another reason for concern resides in the sale significance test, since it is not specified whether such tests have to be carried out periodically or basing on the portfolio lifetime³⁰.

With regards to the re-classification of financial activities, we only have a guideline for what concerns the time when such re-classification should happen. In Ernest and Young's (chapter 47 par. 9) it is established that "the reference to reporting period includes interim periods for which the entity prepares an interim report. For example, an entity with a reporting date 31 December might determine that there is a change in its business model in August 2018. If the entity prepares and publishes quarterly reports in accordance with IAS 34, the reclassification date would be 1 October 2018. However, if the entity prepares only half-yearly interim reports or no interim reports at all, the reclassification date would be 1 January 2019".

Thus, if a bank prepares quarterly financial statements, the reclassification of financial instruments can take place directly in the quarter following the change in the business model.

PwC³¹ has decided not to express its views on this matter (leaving the reviser with a lot of doubts). Thus, in its audit guide, it affirms that "*there is no bright line for how many sales constitute 'infrequent' or 'significant'; an entity will need to use judgement, based on the facts and circumstances*". Therefore, there are no specif thresholds to determine whether the sales were significant to individuate a "hold to collect" business model. Sales have to be considered

³⁰ EY Auit Giude:"The standard is not explicit as to whether any test of insignificance should be performed period by period, or by taking into account sales over the entire life of the portfolio. However, if a period by period approach were to be used, the determination of whether sales are insignificant in value would depend on the length of the period, which means that two entities with identical portfolios but with different lengths of the reporting period would arrive at different assessments".

³¹ Manual of Accounting, IFRS 2019 – Volume 2, chapter 42, par. 42.26

for each entity. On the other hand, the PwC Audit Guide gives no indication regarding the time of recalculation.

KPMG³² agrees with this view, as we can read in its audit manual 18/19, chapter 7, paragraph 7.4.100.33 where it is said that the principle does not provide adequate information. Indeed, there is no way to assess whether or not the views are significant at an individual or aggregate level³³. KPMG tries to give its opinion on this matter and states, in the same paragraph, what follows:

"We believe that size of the portfolio is the relevant reference point because the objective is to assess the extent to which assets in the portfolio are sold as part of assessing the business model of the portfolio, not to compare the size of the transactions in the portfolio to other assets of the entity".

Moreover, the audit firm believes that a careful evaluation and comparison of the profits and losses resulting from the sale with the total return of the portfolio constitute an essential element. For instance, if the profits generated by the sale are higher than those obtained by keeping the securities until maturity, it could be a case of not evaluating the portfolio within the "Hold to Collect" business model³⁴. On the other hand, KPMG's position is identical to EY's one with regard to reclassification. The reporting period is linked to the frequency of publication of the financial statements. So, if the business model change is observed in February and the bank publishes the financial statements as of the 31st of March, the reclassification will take place from April 1 (KPMG - Insight into IFRS, Volume 2, 15th edition 2018/19, chapter 7, para. 7.4.470.20)³⁵.

If KPMG and EY are aligned on the reporting period of the reclassification, Deloitte is of a different opinion. Indeed, in its accounting manual "Deloitte – $iGAAP \ 2019 - Volume B - Financial Instruments" under the dedicated section "IFRS 9 and related Standards, B2 Financial Assets" paragraph 6.4-1 the company affirms that: "IFRS 9 is not explicit as to how to interpret 'the first day of the first reporting period following the change in business model' in the context of interim financial statements. Specifically, it is not clear whether the 'the first day of the first day$

³² KPMG - Insight into IFRS, Volume 2, 15th edition 2018/19, chapter 7, para. 7.4.100.33

³³ "IFRS 9 does not contain any further guidance on how to assess whether sales are 'insignificant individually and in aggregate"

³⁴ "We also believe that a comparison of gain and losses from sales with the total return of the portfolio could be used as an additional relevant reference point to indicate further cases in which the business model is not to hold assets in order to collect contractual cash flows"

 $^{^{35}}$ «IFRS 9 does not define the term 'reporting period'. In our view the reclassification date is dependent on the frequency of the entity's reporting – i.e. quarterly, semi-annually, etc. For example, if an entity with an annual reporting date of 31 December that reports quarterly determines that its business model has changed on 15th March, then we believe that its reclassification date is 1 st April. »

reporting period following the change in business model' is the next interim financial reporting period or the next annual financial reporting period".

Therefore, Deloitte claims that it isn't clear whether the "first day of the first reporting period following the change in the business model" refers to the quarterly (or interim) reporting or the annual one.

We have just analysed all the critical accounting aspects of IFRS 9, for which not even the "Big four" are able to give a common and exhaustive interpretation. We will now focus on the publications that aim to define the impacts of the adoption of IFRS 9 in terms of capital and, in particular, capital ratios.

On the 20th December 2018, The European Bank Association (EBA) published a document called "FIRST OBSERVATIONS ON THE IMPACT AND IMPLEMENTATION OF IFRS 9 BY EU INSTITUTIONS" which, as specified in the executive summary, has the objective of providing preliminary observations on the adoption of this accounting standard. Before issuing this document, the EBA had previously published two other papers on this subject³⁶. However, they had only forecasted what the impact on the financial statements could have been since the accounting standard had not come into force yet. I now will report the main observations that can be found only in the last paper as the data are real and consistent with the forecasts for 2016 and 2017.

The sample used by the EBA is the same as the one considered in the previous two publications: 54 banks belonging to 20 countries of the European Union. The sample is considered representative of the European banking sector and is composed of banks that differ in size, business model and risk profile. To carry out the analysis, data were collected from what was submitted to the supervisory bodies according to the COREP and FINREP models.

The main observations obtained are described below:

• The main impact of IFRS 9 adoption on banks' balance sheets was an average decrease in the CET1 ratio of 47 bps. The negative impact decreases to 27 bps when calculated with the weighted average over total assets. Larger banks, therefore, have a higher credit quality.

³⁶ See: 10 November 2016: *"first report on the results of its impact assessment of IFRS 9 'Financial Instruments"*.

¹³ July 2017: "Updates on the impact of IFRS 9 on banks across the EU and highlights current implementation issues".

- The sample was then divided between banks using the standardized approach to assess credit risk³⁷ and banks using the internal rating-based approach³⁸. Banks mainly using an IRB approach experienced a smaller negative impact in terms of the CET1 fully loaded ratio (19 bps on simple average) than banks mainly using an SA approach for credit risk (157 bps 6 on simple average), on the transition date.
- The last piece of evidence concerns provisions. All the banks subject to analysis registered an average 9% increase in provisions on credit. The increase in provisions on day one is higher for mainly IRB banks (11.4%) than for mainly SA banks (7.4%). The increase is mainly due to stage 1 and 2 exposures, which represent 93% of the total.

Another very interesting analysis of the impact of IFRS 9 on the financial statements was carried out by PwC Spa. The findings are collected in the "*IFRS 9 Benchmark analysis*", which focuses on the issues of classification, measurement and impairment with particular attention to the impact in terms of CET 1, expected credit losses and coverage ratios of the credit portfolios.

The sample was composed of 15 Italian banks selected by considering their total assets as of June 30, 2018. Data are derived from reports published directly by the sampled banks. The analysis showed a marked reduction in CET1 for practically all banks. It fell by more than 90 points on average, for some banks the reduction is more than 250 bps. Only three banks saw a minimal increase. For further details see the graphs below.



Total impact on CET1 at First Time Adoption stage (1/2)

³⁷ Method involving standard weightings for 11 distinct categories of debtors/transactions.

³⁸ If they apply the IRB method, banks carry out an internal assessments of debtors and estimate the capital required to cover the maximum loss that is suitable to occur in a given period of time with a certain degree of probability. Weightings are then calculated, taking into account various qualitative elements.



Figure 5 & 6 : "First time adoption – Impact on cet 1" Source: PwC – IFRS 9 Benchmark analysis – pag. 8,9.

This analysis reveals a significant increase for what concerns the expected credit loss as well. According to PwC, this rise is mainly due to the fact that banks are in stage 1 or 2. The direct consequence of such an increase in expected losses is an increase in the coverage ratio as well, as we can see from the following table, which compares the coverage ratios of different banks first under IAS 39 and then under IFRS 9.

Banche	Tipologia deteriorato	% coverage IAS 39 31/12/2017	% coverage IFRS 9 01/01/2018
	Totale	56,34%	59,25%
	Sofferenze	65,91%	72,12%
Unicredit ¹	UTP	43,61%	43,62%
	Past Due	39,91%	35,40%
	Totale	51,10%	56,72%
Intesa Sannaolo	Sofferenze	63,08%	69,11%
intesa banpabio	UTP	28,42%	33,34%
	Past Due	20,21%	21,26%
	Totale	48,8%	51,2%
C	Sofferenze	58,9%	66,2%
Gruppo Banco BPM -	UTP	32,3%	32,9%
	Past Due	15,7%	19,0%
	Totale	65,51%	68,79%
Banca Monte	Sofferenze	75,74%	77,57%
dei Paschi di Siena	UTP	39,51%	45,41%
	Past Due	20,89%	31,64%

Banche	Tipologia deteriorato	% coverage IAS 39 31/12/2017	% coverage IFRS 9 01/01/2018
	Totale	35,50%	40,00%
UBI Banca	Sofferenze	45,05%	52,06%
obi buildu	UTP	22,81%	22,99%
	Past Due	6,36%	9,60%
	Totale	48,70%	57,37%
BPER Banca	Sofferenze	59,30%	66,47%
	UTP	27,19%	39,87%
	Past Due	10,60%	13,33%
	Totale	44,94%	57,64%
Crédit Agricolo Corina-	Sofferenze	59,46%	71,18%
Credit Agricole Cariparma	UTP	25,14%	33,35%
	Past Due	10,76%	12,21%
	Totale	45,11%	48,94%
Credito Emiliano	Sofferenze	61,06%	66,23%
(Credem)	UTP	19,38%	19,83%
	Past Due	18,00%	20,75%
Banche	Tipologia deteriorato	% coverage IAS 39 31/12/2017	% coverage IFRS 9 01/01/2018
	Totale	51,18%	51,79%
Panas Panalara di Candria	Sofferenze	65,65%	67,58%
Banca Popolare di Sondrio	UTP	34,27%	26,64%
	Past Due	17,17%	12,90%
	Totale	45,00%	47,47%
ECA Bank	Sofferenze	79,98%	74,58%
FUA Dalik	UTP	21,66%	28,12%
	Past Due	48,41%	32,40%
	Totale	45,34%	50,87%
Credito Valtellinese (Creval) 1	Sofferenze	62,33%	71,51%
oregito valteninese (oreval) .	UTP	33,57%	39,06%
	Past Due	8,03%	14,97%
	Totale	44,81%	50,29%
Banca Carige ²	Sofferenze	64,24%	74,55%
Danica Gange	UTP	34,80%	37,47%
	Past Due	17,28%	18,52%

rugure 6 & /: "Impact for specific Banks" Source: PwC – IFRS 9 Benchmark analysis – pag. 46, 47, 48

For what concerns the measuring and classification, the analysis showed that the banks considered kept evaluating financial instruments in continuity with the previous accounting standard IAS 39. Once again, we list some examples which compare financial statement line items under IAS 39 and IFRS 9.

99,48% x =99,552% 0,025%	AC FVOCI
$\overline{x} = 0,006\%$ 0,49% $\overline{x} = 0,441\%$	FVTPL
	IFRS 9
$ \begin{array}{c} 2,3\% \\ \overline{x} = 15,27\% \\ 96,05\% \\ \overline{x} = 78,854\% \\ 1,65\% \\ \overline{x} = 5,876\% \\ \end{array} $	AC FVOCI FVTPL
99,85%	IFRS 9
$\overline{x} = 99,552\%$ 0,001% $\overline{x} = 0,005\%$ 0,15% $\overline{x} = 0,441\%$	FVOCI FVTPL
	IFRS 9
2,47% x̄ =15,27% 95,96%* x̄ =78,854% 1,57% ȳ = 5 875%	AC FVOCI FVTPL
x	
	IFRS 9
99,61% \overline{x} =99,552% 0% \overline{x} =0,006% 0,39% \overline{x} =0,441%	AC FVOCI FVTPL
	IFRS 9
11,71% 〒=15,27% 83,43%	AC FVOCI
	$ \begin{array}{c} 99,48\% \\ \overline{x} = 99,552\% \\ 0,025\% \\ \overline{x} = 0,066\% \\ 0,49\% \\ \overline{x} = 0,441\% \\ \end{array} $ $ \begin{array}{c} 2,3\% \\ \overline{x} = 15,27\% \\ 96,65\% \\ \overline{x} = 78,854\% \\ 1,65\% \\ \overline{x} = 5,876\% \\ \end{array} $ $ \begin{array}{c} 99,85\% \\ \overline{x} = 5,876\% \\ \hline \overline{x} = 0,006\% \\ 0,15\% \\ \overline{x} = 0,441\% \\ \end{array} $ $ \begin{array}{c} 99,61\% \\ \overline{x} = 0,85\% \\ \overline{x} = 5,876\% \\ \end{array} $

4.2 Fair value accounting and Regulatory capital requirement

Sanders Shaffer (2010) from the Federal Reserve Bank of Boston analysed a sample of banks to measure the strength of the link between fair value accounting and financial crises. Sanders Shaffer wanted to study this issue because many believe that the triggering cause of financial crises lies in the confluence of fair value accounting and bank capital rules.

This belief is based on the fact that questionable valuations of long-term investments are made based on illiquid market prices. Critics then believe that measuring financial instruments using fair value can lead to an amplification of economic shocks and increase income volatility.

In his paper, Sanders Shaffer looked at the top-tier Bank Holding Companies in the US with assets greater than \$100 billion. He made this choice for two reasons: first, large banks are the ones that value a significant portion of their balance sheets using fair value. Secondly, they have investment portfolios that contain illiquid assets (in fact, illiquid or complex securities are considered the main cause of pro-cyclical asset price declines).

The data used by Sanders Shaffer came from the 2008 annual financial statements and the 2008 holding company regulatory filings. 2008 was specifically chosen by the economist, as it is considered the period of greatest crisis.

The results showed that the impact of fair value in regulated markets is minimal.

In fact, capital destruction was caused by the deterioration of loan portfolios and was exacerbated by proprietary trading losses.

Thus, there is no evidence that fair value linked to regulatory capital rules led banks to sell investments at distressed prices promoting the pro-cyclical effect that accelerated the price decline in investment assets.

Tatsuya Yonetani and Yuko Katsuo (1998) conducted an empirical study to assess the influence of fair value accounting on the volatility of earnings and regulatory capital ratios and whether this increase in volatility is reflected in bank share prices. To do this, they compared the volatility of capital adequacy ratio using the current formula of the Basel Accord, in order to consider the effect of unrealised gains of investments as well. Tatsuya Yonetani and Yuko Katsuo based their analysis on a sample of 87 Japanese banks that adopted capital adequacy ratios based on the 1988 Basle Accord more than once in the fiscal years comprised between 1989-1996. The results obtained by the two economists can be summarised as follows:

- Banks' incomes based on fair values of investment securities are more volatile than earnings based on historical cost securities gains and losses.

- There is no empirical evidence to support the claim that investors generally demand an excessive premium due to the increased volatility caused by fair value accounting.

- This does not mean that gains measured at fair value are irrelevant. In fact, for investors valuing low capital-ratio banks' shares, fair value earnings provide more useful information than historical cost earnings.

- In conclusion, the use of fair value accounting increases the volatility of earnings and, as a consequence, regulatory capital ratios appear more volatile as well. However, this does not increase risks.

Wayne Landsman conducted a study to evalue the costs and benefits of using a fair value accounting system for bank regulation. The legislator has often questioned whether disclosing accounting amounts is relevant for investors, since it has also wondered if accounting amounts are measured with sufficient reliability so that they can be considered a useful indicator for investors. Such policy question is often operationalised using value relevance regressions, testing for the incremental association of accounting amount under study in explaining cross-sectional variation in equity share prices.

However, fair value is not well defined in relation to markets that are not liquid. Furthermore, fair value estimates of bank assets and liabilities contain relative measurement errors; Barth (1994), Landsman and Wahlen (1995) wrote a paper providing evidence to support this theme. These economists have indeed shown that net income measurements based on fair value are more volatile than those based on historical cost. However, this volatility is not reflected in banks' share prices. As a final finding, Wayne and Landsman stated that banks more frequently violate regulatory capital requirements under fair value than under historical cost.

4.3 Quantitative Easing and the impact on the Banking industry

In this part of the literature review, articles and studies will be analyzed to understand how the quantitative easing monetary policy has impacted the economy and, in particular, the banking sector. The review will be descriptive to facilitate reading and objectively analyze the existing research on the subject. In order to do this, more than 30 articles and papers have been read on the subject. I've then decided to analyse, in this report, only those that underline the impact of QE on the economy in general and in particular on the banking sector. Initially, I intended to review articles from 2015 to 2020 but, given the difficulty in finding useful material, it was decided to extend the time, including materials that were produced since the year in which this monetary policy began: 2008.

Giardin and Mussa (2011) used the VAR model³⁹ to study the impacts of Japanese monetary policy on the main macroeconomic variables:

- 1. real activity factor
- 2. prices factor
- 3. monetary base, and
- 4. interest rate factors

The methodology used was the following: they divided the analysis period into two fractions, one going until 1999 and a second which corresponds with the start of the Quantitative easing policy in Japan. The results show that, in a period characterised by a passive monetary policy, the regression was way bigger and caused a further decrease in production. You can see some tables showing such results below.



Figure 8&9 : "Response to a monetary base shock" Source : Giardin e Mussa, 2011, p. 15

Thus, there was a significant response to the monetary shock in the production factor (3 times greater and 50% longer lasting than the response in the first regime). The effect, however, is short-lived and ends about 13 months later. The response of the price factor, while slightly smaller, is much longer-lived. The impulse responses indicate that a 1% increase in the monetary base results in a cumulative 0.05% rise in prices over 5 years. The decrease of the

³⁹ Vector autoregression (VAR) is a statistical model used to capture the relationship between multiple quantities as they change over time. VAR models generalize the single-variable (univariate) autoregressive model by allowing for multivariate time series. (Treccani dizionario Economia e Fiananza)

interest rate factor becomes then significant with one year of delay. However, the positive effect of this expectation channel remains small as the response of the interest rate factor becomes insignificant from the beginning of the second year. In summary, results indicate that the quantitative easing policy not only prevented further recession and deflation but also had a relevant role in stimulating real activity and prices in the short to medium run.

The VAR method has also been used to study the effects of unconventional monetary policy on inflation expectations in the Euro area (S. Asshoff, A. Belke and T. Oswaski, 2020). The objective of their paper was to examine the effects of an unconventional monetary policy (such as the quantitative easing one) on inflation expectations in the euro area. The authors point out that traditional monetary policy tools are no longer effective and fail to deliver the desired results when interest rates are at zero. This was the situation when the European Central Bank was forced to adopt the unconventional policy of Quantitative Easing. This article also guides the reader through the historical background of the Great Recession of 2008 and the major steps that led the ECB to the QE policy. They used the Qual VAR methodology of Ducker (2005) in order to estimate the ECB's unconventional monetary policy impact on inflation expectations and on real economic activity and shadow rate (to check the consistency of their empirical results). By constructing a latent variable⁴⁰ based on binary information from the ECB's announcements and implementations of UMP, they were able to create an endogenous variable that represents the ECB's propensity to UMP. Then the authors studied the period from January 1, 2009 to January 1, 2018 i.e. one quarter before the ECB's announcement to purchase liquidity-providing Longer-term Refinancing Operations (LTRO) with the maturity of one year. The VAR model was, therefore, conducted on four endogenous variables:

- The real GDR growth;
- The shadow rate⁴¹;
- The ECB's Survey of professional Forecast 12 months ahead⁴², and;
- The latent propensity of UNP of ECB.

The latter is based on a binary index it takes value 1 if UMP measures take place or 0 overwise. It is represented in the following figure. The series becomes positive in correspondence with

⁴⁰ Hidden or non directly observable variable since it represents concepts which are either very general or complexv.

⁴¹ When the federal funds rate hovers near zero, many economic models stop working. Researchers developed a "shadow rate" that can stand in for the fed funds rate, drop into negative territory, and make those models functional again. The shadow rate tracks the movements of various benchmark data. (Wu and Zhang, 2016). ⁴² "The ECB Survey of Professional Forecasters (SPF) collects information on the expected rates of inflation, real GDP growth and unemployment in the euro area at several horizons, ranging from the current year to the longer term. Expectations are reported not only as point forecasts, but also as probability distributions, providing a quantitative assessment of risk and uncertainty" – Def. European cental bank website .

every date when the ECB made an announcement. These announcements are represented in the figure as shaded areas.



Source: S. Asshoff, A. Belke and T. Oswaski p. 18

According to S. Asshoff, A. Belke and T. Oswaski an unconventional monetary policy produces an upward thrust of inflation expectations but only in the short period. Indeed, it seems that in the midterm such an effect disappears. To better understand these results, the following graphics show the responses of the four variables corresponding to a shock if the latent variable: the propensity of UNP of ECB (y).





The first observation that can be done is that a shock in the latent variable y results in a rise in the ECB's willingness to undertake other UMP measures (figure d). Moreover, the researchers noticed a positive correlation between the propensity of undertaking unconventional monetary

policy measures and GDP's growth. However, a rise in the GDP can be observed only after two quarters. Inflation expectations, on the contrary, grow immediately in the following period (figure b), but such an effect disappears approximately three or four periods after the shock. Lastly, shadow rates immediately decrease in response to the shock (figure c).

After having analysed these studies on the QE's effect on both Japan and Europe, it is interesting to focus on the effect produced by an unconventional monetary policy on the FDE. With regard to this, A. Belke (2018) tried to study its efficacy in terms of reduction of the interest rate and/or inflation increase. Moreover, the author tried to give a global dimension of the QE utilised by the FDE. In the first part, Belke explains the motivations that lead central banks to adopt unconventional monetary policies in response to the financial crisis when interest rates are close to 0. He underlines that the effects of such policies strongly depend on the state of the economy, financial markets and capitals. The majority of academic studies on this topic focus on the developments of QE in a given country. Belke affirms that financial markets are closely linked and integrated as well as interest and change. Indeed, as we can see in the figure below, medium-long term interest rates decreased by more in those countries that didn't implement the QE. The figure indeed shows medium-long term interest rates of EU countries were lower than those of non-EU countries even before BCE's announcement concerning the adoption of the QE.



Figure 12: Long-term interest rates in important currency areas since 1990 Source : A. Belke p. 301

Using this model, Belke found out that Quantitative Easing has a very limited effect on both US and EU interest rates. For these reasons, the author concludes that there is no evidence that QE has an impact on medium-long term interest rates. Nevertheless, an explanation for interest rates reduction can be found in the global tendency to reduce them. Indeed, this trend has been going on for at least 25 years now. The effect in the short term - which was already considered by other papers - is due to the influence of expectations on future rates. Exchange and interest rates are influenced by investors' expectations of future rates. Therefore, an announcement concerning securities purchasing programs issued by Central Banks can create bigger impacts than policies themselves.

5 Research Design

5.1 Research approach

In this part of the paper, I am going to explain in detail the methodology used for the empirical analysis of a sample of N European banks.

The ultimate aim of my analysis is to verify whether banks decide to shift large amounts of securities from a fair value measurement to an amortised cost valuation to avoid negative capital impacts (capital ratio) as a result of a rise in sovereign bond yields. As seen in the previous section, a change in the bank's business model is needed in order to reclassify securities from one balance sheet class to another.

Below there is an outline of the financial statements highlighting the lines that have been considered for the purposes of the analysis. For clarity, the financial statements have been reported under both IAS 39 and IFRS 9.

Assets under IAS 39

Cash
FI Held for trading
FI at FV
AFS FI
HTM FI
Loans to banks and loans to customers
Hedging Derivatives
Current and deferred tax assets
Remeasurement adjustment on interest rate risk
hedged portfolios
Accrued income and deferred tax assets
Investment Property
PPE
Intangibile Assets
Goodwill
Total assets

Assets under IFRS 9

Cash FI at FVtP&L FI at FVtOCI FI at AC Hedging Derivatives Reveluation differences on portfolios hedged against interest rate risk Investments of insurance companies Tax assets Others assets Non-current assets Investments accounted for using the equity method Tangible and intangible assets Goodwill Total assets

Specifying the differences between IAS 36 and IFRS 9 is fundamental. As we will see later on in the dedicated part (magari cita il paragrafo), the data collection begins with the last quarter of 2015 and ends with the first quarter of 2020. Therefore, in order to allow comparability, it is essential to distinguish the items in the financial statements under the two accounting standards, especially because IFRS 9 has come into force only in 2018. After having collected all the data related to the composition of these classes from the explanatory notes, it is possible to start the analysis. I will begin with a descriptive analysis of the data.

Then the simple will be divided into two groups:

- The first group contains banks belonging to a state which, at a certain time of the year, has suffered a shock in terms of spreads, i.e. it has seen its government bond yields increase;
- The second group contains the banks which, during the same period, did not have any spread problems.

I will therefore analyse whether there are substantial differences between the two groups as regards the classification of government bonds. In particular, I am going to verify and quantify whether, in the quarter characterised by an increase in spreads, the banks that are part of group 1 moved large quantities of securities from a valuation at fair value to one at amortised cost. In order to do this, I will first study the composition of the classes: we expect a decrease in the number of securities included in the Available for sale Financial Instruments (or FI t OCI) and a simultaneous increase in the Hold to Maturity financial instruments (FI at AC).

If this shift occurs, I will analyse its causes and whether this phenomenon is more pronounced in banks that have a high percentage of securities evaluated at a fair value compared to total assets. I will also study whether this phenomenon is related to the percentage of government securities measured at fair value out of total government securities on the balance sheet. What just said constitutes my hypothesis. Should it be true, we would be in the presence of a problem of rules, meaning that the accounting standard of IFRS 9 requires a change in the business model to reclassify assets from one class to another.

5.2 Sample selection & data collection

Since in my analysis I was interested in the evaluation of financial instruments differences between banks, I used a sample made of N banks located in 6 European countries. Data are used to verify the association between the movement in the classification of financial instruments and the increase in the government securities' yields. In particular, we will try to understand if banks move financial instruments from a fair value valuation to one at amortised cost to avoid losses and a worsening of equity ratios.

The two reasons why I chose to focus only on financial institutions are the following ones: the IFRS 9 rules, which mainly affect bank balance sheets and the fact that these institutions are the ones that hold the majority of outstanding securities.

All financial data has been collected from the quarterly balance sheet downloaded from the bank's website in the dedicated section.^{43 1}

In my analysis I considered only the financial instruments classified in the following areas:

- 1. IAS 39:
 - Financial assets held for trading;
 - Financial assets measured at fair value;
 - Financial assets available for sale;
 - Financial assets held to maturity.
- 2. IFRS 9:
 - Financial assets at amortised cost;
 - Financial assets through Other Comprehensive Income;
 - Financial assets through Profit & Losses.

The following table shows the detail level used both under IAS 36 and under IFRS 9:

⁴³ However, it was not possible to download the data directly from a database as the level of detail was not sufficient. Therefore, it was necessary to look at financial statements notes to understand the breakdown of the classes used.

IAS 36	IFRS 9
FI HFT	FItP&L
Debt securities	Debt securities
- Of which gov. Bound	- Of which gov bound
Equity securities	Equity securities
• Derivatives	Derivatives
• others	• others
FI at FV	FI Mandatory at fair value
• debt securities	debt securities
- Of which gov. Bound	- Of which gov. Bound
• equity and UCI	• equity and UCI
AFS FI	FItOCI
debt securities	debt securities
- Of which gov. Bound	- Of which gov. Bound
• other	• other
Held to maturity FI	FI at AC
debt securities	debt securities
- Of which gov. Bound	- Of which gov. Bound
Loans to banks	loans to banks
Loans to costumers	loans to costumers
Total assets	Total assets

Table 2: "Level of detail used in data collection" Source: personal developing

Data shown in the table were collected from each bank's quarterly financial statement notes. The period considered goes from the last quarter of 2015 to the first quarter of 2020.

I also calculated two additional indexes. The first is the percentage of government securities measured at fair value out of the total government bond on the bank balance sheet. The second one refers to the percentage of Government securities at fair value out of the total assets of the

banks. These two indexes are useful to understand whether the event being studied is much more present in banks with higher ratios. To do this, all government debt securities belonging to the financial instruments Held for Trading, Financial Instruments at Fair Value and Available for sale Financial Instruments for fiscal years 2015-2017 were considered together.

For the period following 2018 – when IFRS 9 was introduced – I also considered the government securities within the Financial Instrument at Fair value through Profit & Losses, Financial Instruments mandatory at Fair Value and Financial Instruments at Fair Value through Other Comprehensive Income.

Furthermore, at the end of each quarter, I collected spread data for each country considered in the analysis from the Italian Stock Exchange website.

State	Banks	Ν
Italy	Unicredit, Intesa SanPaolo, Ubi Banca, Credem, Mediobanca,	
Italy	BPER Group, Banca Monte dei Paschi di Siena, Carige	8
Franco	BNP Paribas, Crèdit Agricole, Societè General, Natixis, Credit	
France	Mutiel, BPCE Group	6
Germa		
ny	Deutsche Bank, Commerzbank, DZ group	3
Spain	Banco Santander, BBVA, CaixaBank, Bankia, Banco Sabedell	6
		1
		1

The composition of the sample by country of origin is given below:

Table 5: "Sample composition by country" Source: Personal developing

VARIABLES

In the previous section, I explained the process of data collection. Now I am going to analyse the variables that (will) compose the dataset.

The first variables are descriptive and represent the name of the bank (*BANK*), the state in which the bank is located (*STATE*), the year under analysis (*YEAR*) and the quarter of reference (*QUARTER*).

The other variables are quantitative. Some of them are equal for all the banks located in the same state, while others change across banks and countries. The table below summarises the variables considered.

Variables	Description
BANK	Bank name
STATE	Bank's origin country
YEAR	Year under analysis
QUARTER	Quarter under analysis
SPREADEND	Spread value at the end of the quarter
SPREADMOV	Spread incremento o diminuzione
FI HFT (FI at FV)	Financial instruments held for trading
	purposes
FIatFV (FI mandatory at FV)	Financial instruments at fair value using the
	fair value option
AFS IF (FItOCI)	Available for sale financial instruments
HTM FI (FI at AC)	Hold to maturity financial instruments
LOANSB	Loans to Banks
LOANSC	Loans to customers
TOTASSET	Total assets
%FVGOVONA	Government Bond at Fair value / Total
	assets
%FVGOVBONB	Government Bond at Fair value / Total
	Government Bond

Table 6: "Variables Description" Source: Personal developing

SPREADEND: represents the spread values measured at the end of each quarter, i.e. the difference between the yields on securities of a given country and the yields on securities of a risk-free state (in our case Germany). This makes it possible to understand the trend of government bond yields and then define the next variable which is *SPREADMOV*.

FI HFT: represents the value of government securities held for trading purposes and measured at fair value in the financial statements of individual banks. The *FIatFV* variable includes government securities measured at fair value using the fair value option while the *FIAFS* measures government securities measured at fair value but held by individual banks in the portfolio available for sale. *FIatAC* measures government securities that are held to receive cash flows until maturity and are measured at amortised cost. Two other variables are *LOANSB* and

LOANSC which represent loans to banks and loans to customers respectively. *TOTASSET* represents the total assets of each bank.

The last two variables consist of two ratios. The first one represents the percentage of government securities measured at fair value on total assets (%*FVGOVBONA*), while the latter refers to the percentage of government securities measured at fair value on total government securities on the banks' balance sheet (%*FVGOVBONB*).

6. Data Analysis

The goal of the present thesis was to verify whether a correlation between different macroeconomics events and, in particular, between spread and the way by which institutions account for certain items in the budget – does exist. As shown by the literature review, several economists are convinced that fair value accounting increases capital ratios' volatility.

In this chapter, this hypothesis will be tested by considering the annual budget of four different European National Central Banks (Italy, Spain, France and Germany) in the period comprised between 2016 and 2019. The results will then be analysed. The reason why I chose these countries lies in the fact that to conduct a significant assessment of the results, it is necessary to consider a sample made by States that all fall under the same regulation (in this case, the European Union's). Therefore, countries which fall outside European Union's regulation scope on the matter, such as the UK or the USA, were excluded.

Another factor which influenced my choice was considering the spread level registered in each of these areas in the given period (2016 - 2019). As shown in the table below, Italy was characterised by a high level of spread which reached peaks of 250 bps. On the contrary, Spain, France and Germany were not affected by this issue, as the highest level registered is 47 bps in France.

Period	Italy	Spain	France	Germany
2016	154,55	115	47	N/A
2017	164,37	118	35,8	N/A
2018	251,46	115	45,5	N/A
2019	162,67	126	30,7	N/A

Table 7: "Spread level for each country between 2016 - 2019" Source: Il sole 24 ore

The total assets that each bank reported at the end of every financial year were calculated for two reasons.

Firstly, to use them as an indicator of the dimension of every chosen Bank: the highest the total assets the largest the Bank should be considered. As we can see in the table below, our sample of Italian banks shows average total assets significantly lower than those of the other countries considered. For instance, the Italian total assets were only 289 million euros in 2016, while Germany, France and Spain reached, respectively, 860, 1.124 and 1.035 million euros during the same financial year.

All these banks (except for Germany) show a rise in their global total assets at the end of the analysis period (2019). Indeed, Italy reached an average of 305 million euros, France 1.315

million and Spain 1.110 million. Germany is the only State which displays a loss since it registers average total assets of only 773 million euros in 2019.

Stato	Banca	2016	2017	2018	2019	2016-2019
Italia	BPER	64.957.028	71.338.807	70.634.767	79.033.498	71.491.025
	CREDEM	39.569.033	41.584.596	43.168.088	47.629.986	42.987.926
	intesa SP	725.100.000	796.861.000	787.721.000	816.102.000	781.446.000
	MEDIOBANCA	73.474.852	72.089.710	76.531.114	82.459.032	76.138.677
	MPS	153.178.466	139.154.192	130.481.006	132.196.007	138.752.418
	UBI	112.383.917	127.376.141	125.306.197	126.525.297	122.897.888
	Unicredit	859.532.774	836.789.724	831.468.724	855.647.000	845.859.556
	Media	289.742.296	297.884.881	295.044.414	305.656.117	1.188.327.708
	DS	347.416.628	356.291.238	353.063.467	363.541.255	1.419.337.583
Francia	BNP	2.076.959.000	1.960.252.000	2.040.836.000	2.372.620.000	2.112.666.750
	CA	1.524.232.000	1.550.283.000	1.624.394.000	1.767.643.000	1.616.638.000
	CM	609.756.000	619.199.000	667.364.000	565.644.000	615.490.750
	NAT	527.859.000	519.987.000	495.496.000	513.170.000	514.128.000
	SG	1.382.241.000	1.275.128.000	1.309.428.000	1.356.303.000	1.330.775.000
	Media	1.224.209.400	1.184.969.800	1.227.503.600	1.315.076.000	4.951.758.800
	DS	652.806.688	613.380.683	647.173.603	795.238.553	2.704.458.748
Germania	COMMERZ	480.450.000	452.493.000	462.369.000	463.636.000	464.737.000
	DB	1.590.546.000	1.474.732.000	1.348.137.000	1.297.674.000	1.427.772.250
	DZ	509.447.000	505.594.000	518.733.000	559.379.000	523.288.250
	Media	860.147.667	810.939.667	776.413.000	773.563.000	3.221.063.333
	DS	516.605.265	469.872.412	404.924.252	372.657.963	1.763.308.228
Spagna	BBVA	731.856.000	690.059.000	676.689.000	698.690.000	699.323.500
	SANT	1.339.125.000	1.444.305.000	1.459.271.000	1.522.695.000	1.441.349.000
	Media	1.035.490.500	1.067.182.000	1.067.980.000	1.110.692.500	4.281.345.000
	DS	303.634.500	377.123.000	391.291.000	412.002.500	1.484.051.000

Table 8: "Total assets in the fourth quarter: average and standard deviation per bank between 2016 and 2019" Source: banks balance sheets

Secondly, I used total assets to calculate the percentage of fair value government bonds detained by each Bank on the average total assets.

Graphic n. 1 shows the average results obtained for each region.

As we can see, Italy was the country with the highest rate of government bonds valued at fair value on the total assets (9,5%) in 2016. This percentage is the average result obtained considering all the 7 Italian banks indicated in the previous table. Each one of these banks presents a different exposure (shown in percentage value), for instance, banks such as Unicredit, MPS e Credem have an exposure of over 12%.

However, if we observe the Italian banks' trend, we can notice how the average percentage of government bonds at fair value on total assets has decreased over the years. This has led Italy to become one of the countries with the lowest exposure, together with Spain. In particular, the highest reduction is observed during the 2017-2018 period, which is when the Italian spread reached its peak. Therefore, the banks that had the highest exposure in 2016 were the ones that reduced it the most in the following years.

On the contrary, Germany acted in a very different way, since it increased its exposure in 2017 and 2018.

As the graph shows, France and Spain managed to keep their exposure almost unchanged over the past few years, regardless of being characterised by very different spread levels. Indeed, France kept its spread stable while Spain, despite presenting a high level of spread during the same period, didn't reach peaks as high and prolonged as Italy.



Graph 1: "% government bound at fair value on Total Asset: average value per bank for each year (2016 - 2019)" Source: Personal developping

To support the data reported in the previous bar chart, I decided to undertake further analysis. The aim was to understand how many of the government bonds detained by those banks are valued at fair value. As we can see in the graph below, the percentage of government bonds valued at fair value decreases by 25,1% in Italy, as it goes from 84,5% in 2016 down to 59,4%



in 2019. However, this doesn't happen in the other States, where such percentages remain fairly stable.

Graph 2: "% government bond at fair value on Total Government Bond: average value per bank for each year (2016 - 2019)" Source: Personal developping

6.1 Main results

Data have shown a correlation between spread trends and the accounting of government bonds at amortised cost rather than at fair value over 2016-2019.

Analysis of results by geographic area illustrates that the phenomenon under study, namely the changes in government bonds accounting system in correspondence with significative spread shifts), occurred in most of the Italian banks. On the other hand, this wasn't the case for all banks located in all the other countries (Spain, France and Germany), except for one (BNP, France).

Graphs 3 show the main results found for some of the banks under analysis. In detail, the graphs show both the performance of all government bonds indistinctly and the performance of Italian

government bonds only. This focus is due to the fact that only the increase in the Italian spread proved to impact Italian government bonds (Italian bound).

Graph 3 shows the evidence for one of the major Italian banks: Unicredit. The graph illustrates how, following the 2018 spread increase – which arose from around 150 bps to more than 250 bps) – it took only a little more than three months for the bank to change the composition of its securities portfolio. Available-for-sale securities (i.e. securities measured at fair value) decreased by 40%, going down from 80 billion euros at the end of 2017 to 50 million at the end of 2019.

The largest decrease occurs at the exact same time as the largest spread increase. During 2016 a more moderate increase in the spread can be seen and, once again, it coincides with a decrease in securities at fair value, which fell from around 100 million to 820 million euros.

The decrease in available-for-sale securities was accompanied by a simultaneous increase in securities measured at amortised cost, which rose from around 10 million euros at the end of 2017 to around 30 million euros at the end of 2019.



Two further examples that we should consider are Bper bank (graph 4 - 5) and MPS (graph 6-7).

Lest's start from Bper which, in the opinion of this writer, is key for the analysis we are conducting. In fact, every time an increase in the spread was registered, the number of government bonds at amortised cost went up, going from less than 20 million euros to 80

million euros. Meanwhile, government bonds valued at fair value decreased to 40 million euros over the same years.

A similar trend can be found at MPS: when the spread increased, securities available for sale (AFS) decreased. Towards the beginning of 2018, for instance, they were close to 130 million, while they had gone down to 60 million euros by the end of 2019. At the same time, securities at amortised cost had risen by 40 million euros ca.

Looking at graphs 5 and 7, which refer to Italian government bonds only, it is evident that their values are almost identical to those presented in graphics 4 and 6. This means that both of the two banks considered by the graphs hold exclusively Italian government securities. Spread's rise has then a higher impact on these institutions.

On the contrary, graphs 8 and 9, which are presented below, show that Credem holds government bonds which come from other States as well. In particular, roughly 40% of Credem's bonds valued at fair value are Italian, whereas this percentage reaches 90% and 94% for, respectively, Bper and MPS. Therefore, Credem didn't face a change in its accounting system in response to the growing spread, while the abovementioned banks did.



Graph 4: "Bper Analysis" Source: Personal developping







Graph 6: "MPS Analysis" Source: Personal developping



Graph 7: "MPS Analysis – focus on italian gov bounds" Source: Personal developping





Source: Personal developping

However, if we analyse the graph of Ubi banca (graph 10), we do not see such a clear correlation. In 2018, as the spread increases, there are no significant changes between the two types of securities. In fact, those measured at fair value – which corresponded to roughly 100 million euros at the beginning of 2018 – went down to about 80 million euros at the end of 2019. At the same time, those at amortised cost increased reaching 10 million. It is important to note that, unlike the other banks, the change didn't occur as fast. The reason lies in the number of securities measured at fair value out of the bank's total holdings. In fact, during 2017, slightly more than 50% of all the securities held by Ubi Banca were valued at market value, while other banks – such as MPS, Bper and Unicredit – held this type of security only. In particular, Unicredit and MPS had a value of, respectively, 97% and 98% at the beginning of 2016, while Bper reached the lesser value of 80%.

This index remained essentially constant until the end of 2017 when the trend started decreasing, as we can notice looking at 2018 and 2019 values. Unicredit reached 64%, Mps 63% while Bper even dropped to 10.9% (Table 9).



Graph 10: "UBI Analysis" Source: Personal developping

Stato	Banca	2016		2017		2018		2019	
		(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Italia	BPER	7,9%	79,1%	6,5%	72,5%	3,0%	32,0%	1,1%	10,9%
	CREDEM	12,3%	100,0%	10,8%	100,0%	8,6%	66,4%	9,3%	64,1%
	intesa SP	7,4%	87,1%	6,0%	87,1%	5,1%	76,9%	6,5%	81,2%
	MEDIOBANCA	6,5%	78,6%	3,2%	54,9%	5,3%	67,1%	5,1%	70,0%
	MPS	12,7%	98,1%	13,2%	98,2%	11,1%	77,1%	8,8%	63,6%
	UBI	7,5%	51,8%	5,5%	51,0%	6,4%	65,9%	6,6%	61,2%
	Unicredit	12,0%	96,9%	11,8%	94,6%	9,5%	77,5%	6,6%	64,9%
	Media	9,5%	84,5%	8,1%	79,7%	7,0%	66,1%	6,3%	59,4%
Francia	BNP	9,1%	100,0%	8,7%	97,4%	4,3%	72,6%	5,3%	74,2%
	CA	6,1%	89,1%	5,9%	84,2%	5,5%	79,5%	5,5%	80,4%
	CM	2,7%	100,0%	2,3%	99,9%	4,3%	93,7%	6,7%	95,4%
	NAT	7,6%	97,3%	8,0%	98,0%	5,7%	96,6%	8,1%	98,5%
	SG	6,6%	95,9%	6,0%	95,6%	6,1%	93,2%	5,8%	93,0%
	Media	6,4%	96,5%	6,2%	95,0%	5,2%	87,1%	6,3%	88,3%
Germania	COMMERZ	5,4%	60,4%	3,9%	55,8%	2,3%	34,3%	3,0%	40,3%
	DB	13,1%	98,5%	14,8%	98,6%	13,8%	97,3%	10,6%	85,0%
	DZ	2,2%	25,6%	10,0%	61,8%	4,2%	40,1%	6,9%	55,0%
	Media	6,9%	61,5%	9,6%	72,1%	6,8%	57,3%	6,8%	60,1%
Spagna	BBVA	10,8%	79,3%	10,8%	81,3%	10,1%	70,8%	10,8%	70,5%
	SANT	6,6%	69,2%	7,3%	68,9%	6,3%	66,8%	6,6%	73,3%
	Media	8,7%	74,2%	9,0%	75,1%	8,2%	68,8%	8,7%	71,9%

(1) %FVGOVBOUNDonTOTASSET

(2) %FVGOVBOUNDonTOTGOVBOUND

Table 9: "Bond indexes per banks period 2016-2019" Source: Banks balance sheet Moving to the analysis of the banks located in France and Germany, it is pretty evident how spread trends didn't affect government bonds' valuation at all.

Looking at the graph, we can see that these values remained steady for the whole analysis period, presenting minimal variations, which are not related to the subject of this thesis.

Credit Agricole, for instance, saw a steady increase of 100 million euros in both its groups, without suffering from spread variations.



Graph 11: "CA Analysis" Source: Personal developping

On the contrary, Credit Mutiel increased the number of government bonds valued at fair value detained, reaching 200 million euros in three years only. Again, such a rise was steady and not related to spread trends.



6.2 Conclusions

In this thesis, I have noticed that banks which had to deal with a growing spread (Italian banks) changed their bonds accounting strategies. In particular, there has been a shift from holding government bonds valued at fair value to detaining bonds accounted for at amortised cost. This is due to the fact that with increased yields the price of the bonds decreases, therefore bonds valued at fair value face a loss which has to be accounted for at P&L. This loss impacts capital ratios (CET 1, TIER), namely patrimonial ratios used to determine banks' financial stability. In order to avoid a decline in these ratios, banks then opted for policies that are based on accounting at amortised cost instead. However, as we have seen in the literature review part of this thesis, this shift isn't simple nor instant. On the contrary, there is a strong need to respect some of the obligations imposed by the accounting standard.

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