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"Fair Value Accounting and the Financial Market Crisis.
To What Extent is Fair Valuation Responsible
for the Financial Crisis?"

Doctoral Thesis

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Acknowledgements

Abstract (Portuguese)

A crise financeira do subprime atingiu a economia a nível global e foi acompanhada por uma discussão multifacetada sobre a influência dos princípios da contabilização pelo justo valor. O debate atingiu um primeiro clímax em finais de 2008, quando o IASB alterou as normas de contabilização pelo justo valor para instituições financeiras em situação financeira difícil para evitar o aumento de perdas provocadas por diferenças de justo valor. Durante as últimas décadas, os mercados financeiros europeus mostraram uma forte tendência de liberalização, desregulação e integração económica. Esta evolução levou-os a ficar mais instáveis, frágeis e vulneráveis a crises. O presente estudo investiga o aparecimento recorrente de crises financeiras, em geral, focando-se na interdependência entre a última crise do subprime e o justo valor dos instrumentos financeiros da banca europeia, em particular. As instituições financeiras têm um papel importante nas crises financeiras uma vez que são as principais aplicadoras dos princípios da contabilização pelo justo valor, através da IAS 39. Os modelos de negócio das instituições financeiras são apresentados e os tipos de riscos associados indicam uma maior vulnerabilidade a descontinuidades de mercado. A consideração de várias crises financeiras anteriores mostra que essas podem ser desencadeadas sob diferentes cenários. Contudo, elas seguem um padrão similar e têm algumas características comparáveis. Neste contexto, é apresentado um curso-tipo de uma crise financeira em economias desenvolvidas. O estudo demonstra que a contabilização pelo justo valor não foi responsável pela última crise. No entanto, uma legítima preocupação acerca do reporte financeiro elaborado ao justo valor veio à luz durante o período da crise. Alguns críticos alegam que a contabilização pelo justo valor conduz a instabilidade nos mercados financeiros devido a comportamentos irracionais dos investidores, estratégias pro-cíclicas, problemas de liquidez e aumento da subjetividade devido à ausência de preços de mercado. Utilizando uma amostra exaustiva de 316 instituições financeiras que usam o IFRS europeu, examinou-se o impacto de contabilização pelo justo valor na banca europeia e observaram-se os efeitos pro-cíclicos de instrumentos financeiros de justo valor, durante o período de 2006 a 2010. Como resultado, a amostra apresentou pouca ou nenhuma evidência de que a contabilização pelo justo valor acrescentou pro-ciclicidade às demonstrações financeiras dos bancos europeus. A contabilização pelo justo valor parece ser a medida apropriada para certos instrumentos financeiros e um primeiro passo na direção certa. Contudo, a crise financeira revelou algumas fragilidades na área da contabilização pelo justo valor e várias propostas para o seu aperfeiçoamento são discutidas.

Palavras-chave: Instituições financeiras, Contabilização pelo justo valor, IAS 39, IFRS 13, Crise financeira, Bancos, Pro-ciclicidade, Instrumentos financeiros.

Abstract (English)

The subprime financial crisis impacted the economy on a global level and was accompanied by manifold discussions regarding the involvement of fair value accounting principles. The debate reached its temporary peak in late 2008, when the IASB amended the rules of fair value accounting for seriously distressed financial institutions to prevent further recognition of fair value losses. During the last decades, European financial markets showed a strong trend towards liberalization, deregulation and economic integration, but at the same time these developments are held responsible to make financial systems more unstable, fragile, and prone to crisis. This study investigates the recurrent occurrence of financial crises in general thereby focusing on the interdependence between the latest subprime crisis and fair value financial instruments of European banks in particular. Financial institutions play an important role in financial crises as they are the predominant appliers of fair value accounting principles under IAS 39. The business models of financial institutions are presented and the associated risk types indicate the increased vulnerability towards market interruptions. The consideration of several preceding financial crises shows that they may be triggered under different scenarios. However, they follow a similar pattern and have some comparable characteristics. In this context an "ideal-typical" course of a financial crisis in developed economies is presented. The study shows that fair value accounting was not responsible for the latest crisis. However, there are legitimate concerns about financial reporting at fair value that came to the fore during times of crisis. Critics argue that fair value accounting leads to instability in financial markets due to irrational investors' behavior, procylicality, liquidity problems, and increases of company-specific subjectivity in absence of market prices. Using a comprehensive sample of 316 European IFRS applying financial institutions, the impact of fair value accounting throughout European banks is examined and upon procyclical effects of fair value financial instruments observed during the period 2006 to 2010. As a result, the sample provided no or only minor evidence that fair value accounting added additional procyclicality to European banks' financial statements. Fair value accounting seems to be the appropriate measure for certain financial instruments and a first step in the right direction. However, the financial crisis revealed certain weaknesses in the area of fair value accounting and several proposals for improvement are discussed.

Key terms: Financial Institutions, Fair Value Accounting, IAS 39, IFRS 13, Financial Crisis, Banks, Procyclicality, Financial Instruments

Abstract (German)

Die Subprime-Finanzkrise hat die Realwirtschaft auf globaler Ebene getroffen und wurde begleitet von einer mannigfaltigen Diskussion bezüglich der Bilanzierungsgrundsätze zum beizulegenden Zeitwert. Die Debatte erreichte ihren vorläufigen Höhepunkt im Herbst 2008, als der IASB die Regeln zur Fair Value Bilanzierung kurzfristig änderte. Schwer notleidenden Finanzinstituten bot sich fortan die Möglichkeit zur temporären Reduzierung einer Verlustberücksichtigung von bestimmten Fair-Value Finanzinstrumenten. Die europäischen Finanzmärkte zeigten in den letzten Jahrzehnten einen starken Trend zur Liberalisierung, Deregulierung und wirtschaftlichen Integration. Diese Entwicklungen befördern das Zusammenwachsen von Märkten, machen aber gleichzeitig Finanzsysteme anfälliger für Krisen. Die vorliegende Studie analysiert das wiederholte Auftreten von Finanzkrisen und untersucht die Zusammenhänge zwischen der letzten Subprime-Krise und der zum Zeitwert bewerteten Finanzinstrumente von europäischen Banken. Finanzinstitute bilden den primären Untersuchungsgegenstand, da ihnen in Finanzkrisen eine zentrale Rolle zukommt und sie die vorherrschenden Anwender von Fair-Value Bilanzierungsgrundsätzen nach IAS 39 sind. In diesem Zusammenhang werden die Geschäftsmodelle von Finanzinstituten vorgestellt und die damit einhergehenden Geschäftsrisiken zeigen eine erhöhte Anfälligkeit gegenüber Marktstörungen. Die Betrachtung vergangener Finanzkrisen zeigt, dass der Ursprung von Krisen in jeweils unterschiedlichen Szenarien entsteht. Dennoch folgen sie einem ähnlichen Muster und weisen vergleichbare Eigenschaften auf. Diese Eigenschaften werden anhand eines "idealtypischen" Verlaufs einer Finanzkrise in einer entwickelten Volkswirtschaft präsentiert. Die vorliegende Studie zeigt, dass die Zeitwertbilanzierung nicht die Ursache für die aktuelle Krise war. Allerdings offenbarte die Krise einige Schwachstellen dieser Bilanzierungsmethode. Kritiker argumentieren, dass die Zeitwertbilanzierung zu einer Instabilität der Finanzmärkte führen kann aufgrund von irrationalem Anlegerverhalten, pro-zyklischem Verhalten, Liquiditätsproblemen und zu einer Erhöhung von unternehmens-spezifischer Subjektivität in der Abwesenheit von Marktpreisen führen kann. Die Studie untersucht daher eine umfassende Stichprobe von 316 europäischen IFRS-anwendenden Finanzinstitutionen bezüglich der Auswirkungen der Fair-Value Bilanzierung auf prozyklische Effekte im Zeitraum 2006 bis 2010. Im Ergebnis zeigt das Daten-Set keine oder nur geringe Anzeichen dafür, dass die Fair Value Bilanzierung zusätzliche Prozyklizität zu den Abschlüssen europäischer Banken hinzufügt. Die Bilanzierung zum beizulegenden Zeitwert erscheint für bestimmte Finanzinstrumente als die geeignete Maßnahme zur korrekten Abbildung und somit als Schritt in die richtige Richtung. Dennoch hat die Finanzkrise einige Schwachstellen im Bereich der Zeitwertbilanzierung offenbart. Abschließend werden im Rahmen dieser Arbeit notwendige Verbesserungsvorschläge diskutiert.

Schlüsselbegriffe : Finanzinstitutionen, beizulegender Zeitwert, IAS 39, IFRS 13, Finanzkrise, Banken, Prozyklisch, Finanzinstrumente.

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Index of Abbreviations

AT	Austria
BC	Basis for Conclusion
BE	Belgium
BG	Bulgaria
CEBS	Committee of European Banking Supervisors
CH	Switzerland
CHF	Swiss Francs (currency)
CZ	Czech Republic
DCF	Discounted Cash Flow
DE	Germany
DK	Denmark
DP	Discussion Paper
EBA	European Banking Authority
EC	European Commission
ECB	European Central Bank
ED	Exposure Draft
Ed.	Edition
Eds.	Editors
EFRAG	European Financial Reporting Advisory Group
ES	Spain
Et al.	Et alii
Etc.	Et cetera
EU	European Union
EUR	Euro (currency)
EURIBOR	Euro InterBank Offered Rate
F	Framework
f.	Following (page)
ff.	Following pages
FAS	Financial Accounting Standard(s)
FASB	Financial Accounting Standard Board
FI	Finland
FR	France
FRS	Financial Reporting Standard

GAAP	General Accepted Accounting Principles
GB	Great Britain
GBP	British Pound (currency)
GR	Greece
HR	Croatia
HU	Hungary
I.e.	Id est
IAS	International Accounting Standard(s)
IASB	International Accounting Standard Board
IE	Ireland
IFRS	International Financial Accounting Standard(s)
IS	Island
IT	Italy
LU	Luxembourg
LV	Latvia
NL	Netherlands
No.	Number
OCI	Other Comprehensive Income
OLS	Ordinary least squares
P&L	Profit and Loss Statement/ Income Statement
PL	Poland
PT	Portugal
RU	Romania
SD	Standard Deviation
SE	Sweden
SEC	(United States) Securities and Exchange Commission
SFAC	Statement of Financial Accounting Concepts
SFAS	Statement of Financial Accounting Standard(s)
SI	Slovenia
SK	Slovakia
SPE	Special Purpose Entity
t	Item in the year index
Th.	Thousand
TotalAssXX	Total Assets (of the respective year)
XX	

TotalEquXX	Total Equity (of the respective year)
TotalLiabXX	Total Liabilities (of the respective year)
TR	Turkey
UK	United Kingdom
USD ($)	US Dollar (currency)
US GAAP	United States Generally Accepted Accounting Principles
vs.	versus
x	Independent variable
y	Dependent variable
%	Percent
α	Intercept coefficient
β	Regression coefficient
*	Indicator of significance
ε	Confounding factor
€	Euro (currency)
H	Hypothesis
R^2	R squared/ Coefficient of determination

1. Introduction

> *"The Chinese use two brush strokes to write the word 'crisis.'*
> *One brush stroke stands for danger; the other for opportunity.*
> *In a crisis, be aware of the danger-but recognize the opportunity."*
>
> **John F. Kennedy**
>
> (Politician; * 29 May 1917 – † 22 November 1963)

1.1. Initial Situation and Importance

Subprime crisis, financial crisis, Euro crisis. The financial crash of 2007/2008 brought to an end a long period of growth and stability in the United States and most of the European countries. The recent financial crisis is thereby referred to as the sharpest decline in the world economy since the Black Friday in October 1929. Academics, politicians and the general public became aware of upcoming massive financial crisis in the recent years and events originally derived from the United States financial markets became a matter of international interest. What began as a bust on the United States real estate market, soon resulted in consequences noticeable all over Europe, Asia, and other parts of the world. The process of financial globalization had accelerated and the world financial system was thereby growing much faster than the real economy (Deutsche Bundesbank, 2008, p. 15-31). Nowadays, financial markets are globally linked and a major local problem could easily bring turmoil to other continents as the latest financial crisis has shown impressively. If financial crises occur globally, they will also affect the global economy. This arouses a growing interest in the subject of financial crises and requires a precautionary management and prudent regulation. Among academics and economists, the huge impact of the latest financial crises aroused curiosity of other parties now developing interest in that subject. In November 2008, even the Queen of England asked some British academics, why they had not forewarned the crisis. However, in business life as well as in private, predictions of crises are quite a difficult matter. In the New York Times, the American Nobel laureate in Economics Paul Krugman (Krugman, 2009) blamed his economist colleagues at least to some extend for the outcome of the financial crisis, while some others rejected these allegations (Kirchgässner, 2009, p. 436 – 468).

Anyhow, financial crises are not based on certain individuals but rather on a variety of different factors and circumstances that occur together and usually have devastating consequences. Many economists are aware of the occurrence of financial crises, but there exist only a vague consensus about their origin or even their prevention. Financial crises are often associated with less market activity, or - in the worst case - malfunctions of markets, and negative effects towards an economy in form of a recession or depression. At least in capitalistic economic systems, the well-functioning of financial markets is a necessary determinant. Generally, it is agreed that a healthy and stable financial system is of enormous importance for such economies. Thus governments, academics, and market players are very interested in the proper functioning of financial markets. And one other thing remains the same for all experienced financial crises: the severely high costs.

The 2007 United States subprime crisis was one of these extreme cost drivers and the inception of a far-reaching financial and banking crisis. The crisis has been associated with a serious exhaustion and, in several cases, failure of financial institutions, together with stress in credit and inter-banking markets and in the refunding of financial institutions. Due to technical innovations and an increasing global business network the impact of the crisis was not only an U.S.-wide problem. Instead European countries and other economies all over the world were directly and indirectly affected and real economies as well as their taxpayers had to suffer from the severe economic costs of the crisis. It was also the beginning of a phase during which massive political pressure was brought to accounting standard setters. For those, it was a completely new experience which had never occurred before, at least not to such extend.

At the beginning of the recent financial crisis, the problem took the form of a credit crunch, involving complex structured credit products and a restraining in bank lending. As a result financial institutions became increasingly concerned about their balance sheets and their assets. During the dramatic events of September and October 2008, what began as a credit crunch, became a major financial crash. Comparing certain economic conditions the financial crisis had a considerable similarity to the Great Depression of 1929: The economy was in a boom phase, with massive availability of credit, rises in real incomes and in industrial production, enhanced money stock and a market boom in housing prices that reached proportions characteristics for real estate bubble. Each financial crisis is preceded by such boom phase, which is somehow "necessary" for the emergence of a crisis. Or to put it more simple: No boom – no bust. Principally, an external shock to the financial system leads to the outbreak of the financial crisis. While in 1929 the industrial production slowed down and showed some precursor to a recession; in 2007 the reversal in housing led to a frantic

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unwinding of credit default swap positions. In addition, toxic debt written by many banking institutions and the proliferation of personal debt worsened the whole situation (Buckley, 2011, p. 254).

Since the crisis heavily affected Europe, it prompted critical thinking about the EU economic and financial policy frameworks. It also exposed fault lines in governance and deficits in the financial supervisory and regulatory framework. The need for a new supervisory architecture with more effective and prudence regulation and supervision and better coordination became evident. The current process of adjusting the supervision conditions will lead to future changes in the financial sector, resulting in higher regulation and hopefully more transparency within the banking sector. The economic benefits of EU integration are beyond dispute; however it is still necessary to increase the efforts to comprehensive EU-wide solutions towards enhancing financial stability in Europe.

For more than 60 years, the European Union and its member countries grew together, thereby developing common standards. Like many other areas, financial reporting has been in a process of European[1] integration over the last few decades. After thirty years of effort, the year 2005 marked a milestone in the era of financial reporting. The application of International Financial Accounting Standards (IFRS) became mandatory for companies listed on European securities markets and also a voluntary application for other companies was established. This application of a single set of high quality accounting standards makes the information of financial data more comprehensive and provides a simplified way to compare reliable financial information. The application of the new financial accounting standards was accompanied by new policies on how to determine the values of assets and liabilities. Besides recognition and subsequent measurement of assets and liabilities at historical cost and amortized cost, the recognition and measurement of assets and liabilities at fair value was established throughout European IFRS appliers. This fair value accounting is considered as a key feature of IFRS. The application of fair value accounting caused major changes compared to local GAAP requirements in many European countries. The local GAAP requirements are often supposed to be tax driven, law based, creditor oriented and not in particular concerned with determining income as a measure of performance. In contrast the IFRS have an absolute priority towards investors' need for financial information. This shift is accompanied by a change in recording of income. Whereas under many local GAAP

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[1] This process is not only applied across Europe. A lot more countries all over the world were applying international financial reporting standards thus contributing to the development and integration of financial reporting.

regulations companies had to report earnings only after their realization (realization principle), IFRS follow a different approach. Unrealized revenues are partly recognized in the income statement and the statement of other comprehensive income too. The idea is that preparers of financial statements provide useful and timely information in accordance with a set of high-quality accounting standards to cover investors' informational needs[2].

Fair value is defined as the price at which an asset could be exchanged in a current transaction between knowledgeable, willing parties (IAS 32.11). For liabilities, fair value is defined as the amount that would be paid to transfer the liability to a new debtor[3]. Fair value of assets and liabilities plays an important role in the international accounting world. The objective of a fair value measurement is to strive for a market-based financial accounting to provide relevant information for external users and addressees. In principle, all financial assets and financial liabilities are initially measured at fair value (IAS 39.43) and - for their subsequent measurement - split into different measurement categories. These categories determine the type of value proposition, at which the respective assets and liabilities are recognized in the balance sheet. Consequently, assets and liabilities are measured at cost (historical or amortized) and are thereby subject to impairment testing or are recognized at fair value.

For financial institutions is the recognition of assets and liabilities at fair value of particular importance, as they generally recognize significantly larger proportion of assets and liabilities at fair value than ordinary industrial companies. Thereby has the matter of accounting at fair value always been a subject of controversial discussions and continues to generate intense and passionate debates among academics, businesspeople, regulators, supervisors, and investors. Since the 2007 market turmoil, fair value accounting and its application became a topic of a considerable debate. This debate found its temporal peak in October 2008, when the standard setter IASB relaxed the rules of fair value accounting by applying an emergency amendment to IAS 39. This amendment gave financial institutions reporting under IFRS the choice to retroactively reclassify certain financial assets initially recognized and measured at fair value to measurement categories at amortized cost. This amendment was not adopted in an ordinary process of application of amendments and showed a sharp contrast to IASB's general strategy to avoid reclassification of financial instruments. The decision to adjust the

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[2] The standard setter often uses the term "investor" in order to outline the scope of IFRS. However, the definition of investor varies widely with regard to the respective profession, knowledge, and experience in evaluating financial statements.
[3] The definition of fair value has been revised and the definition is uniformly defined by IFRS 13. For more details, please refer to chapter 4.9 and 5.7.2.

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accounting standard was not solely made by the standard setter, rather political pressure by EU Commission and EU leaders led to this conclusion. Here, the accounting standard became a direct matter of political influence. Under normal circumstances, such political interference should not occur. However, concerns about fair value accounting and the procyclicality that fair value accounting may introduce during the times of crisis ended with this political influence to align accounting rules for European financial institutions with those that apply US GAAP, for which a similar reclassification option already existed (SFAS 65, 115). This political influence has been the culmination of a long lasting controversial debate in standard setting about the advantages and disadvantages of fair value accounting.

The number of studies regarding financial crisis and general causes why and how the initially United States based subprime crisis could extend into such a global crisis increased. In this context it is often argued that fair value accounting in international financial reporting standards was not a trigger for the financial crisis, but served as a promoter of the outcome. Especially procyclicality due to fair value accounting may cause information asymmetry and adverse selection problems. As a result, already strained markets have a tendency to overheat.

Despite massive criticism of fair value accounting evolving with the latest financial crisis and a phase during which massive political pressure was brought to the International Financial Accounting Standard setter, it is unlikely that accounting practice returns to traditional historical and amortized cost accounting. The International Accounting Standard Setter IASB and the American counterpart FASB support the use of fair value accounting and are moving away from historical and amortized cost accounting towards fair value accounting (Foster & Shastri, 2010, p. 20). Both argue that fair values in financial statements offer more accurate, comprehensive and timely information than historical and amortized cost accounting. Furthermore, many academics emphasize the advantages of fair value accounting, e.g. the figures are more value relevant than historical/amortized cost figures, which means that they are closer associated with companies' share prices (Magnan & Thornton, 2010, p. 24).

Naturally, there exist further advantages and disadvantages regarding fair value accounting, which are discussed in the course of this thesis. After this introductory presentation of some highlights of the latest development of European financial markets and financial reporting, the next chapters present the motivation for the study and the research questions in more detail.

1.2. Motivation and Objectives

Financial crises are a well-known problem of modern financial markets. At the latest with the financial crisis of 1929, the term and the far-reaching consequences reached inglorious popularity. This first modern global crisis is known as the "Great Depression" and was the first financial crisis suffered by the world capitalist system that affected many areas of the globe simultaneously. But not all financial crises have such a huge impact, some financial crisis have only a local impact and are limited to certain regions. However, global crises are not completely barred as the latest financial crisis has shown. It had such a global impact that this topic experienced increased interest of academics, politicians and the general public. The number of studies on financial and banking crisis has been rapidly growing. The interest has been fuelled by the large number of costly financial crises in the recent decades. But it is also fuelled by increasing data availability helping to analyze these crises in more detail. Even so, the majority of these studies is Anglo-Saxon and predominantly based on data of North American companies.

In earlier decades, it was rather difficult to compare financial information throughout Europe. Each country had its own local accounting standards and principles, which made a comparison a challenging task of studying different accounting standards. And even then, the company data provided may still vary in their availability and matter of detail, which makes the analysis more complicated. With the adoption of the IFRS throughout the European Union (EU), all European publicly traded companies are required to prepare their consolidated financial statements under consideration of a uniform set of International Accounting Standards. The general focus of IFRS is to meet investors' informational needs, but simultaneously this process supports academics, researchers, and other interested parties when comparing financial statements throughout Europe. Nowadays, they are enabled to provide European-wide studies without considering national accounting habits and requirements.

The adoption of the IFRS brought several changes to the recognition and measurement of assets and liabilities too, as briefly mentioned in the introduction. The accounting for certain financial assets and liabilities at fair value is such an innovation. Prior to its introduction, fair value accounting has been controversially discussed for more than thirty years. These days, when financial statement data under IFRS is available, the increasing importance of fair value accounting and the lack of empirical evidence across European institutions represent the foundation for the research design.

The purpose of this study is to empirically investigate the impact of fair value accounting on European banks during the latest financial crisis. The study is based on European financial institutions that provide IFRS financial statements. The increasing importance of fair value accounting is verified by the profile of assets and liabilities of European financial institutions. The implications of fair value accounting are subsequently examined empirically by conducting two comprehensive studies:

- First, it is examined whether the amount of assets and liabilities measured at fair value is significant in a way that it can have an impact on financial statements and income statements.
- Second, it is examined whether the results from fair value assets and liabilities show evidence of extraordinary, procyclical performance during the peak of the latest financial crisis.

The research question provides information about the impact of fair value accounting on European banks during times of crisis. The detailed structure of the research design is given in the following chapter.

1.3. Structure

This study examines the interdependence between fair value accounting and the latest financial crisis. The study itself is divided into seven chapters. After the motivation and research question is outlined, the methodological basis of the work is developed and concluded in the first chapter. The second chapter presents the market players to be researched: European financial institutions and their activities. After the introduction of the market participants, the focus is shifted to financial crisis in chapter three. The term is defined and selected crisis of the past 90 years are displayed in more detail. Chapter four and five are accounting related and are composed of general accounting legislation, the development of International Financial Accounting Standards (chapter four), and the application of IAS 39 "Financial Instruments: Recognition and Measurement" in detail (chapter five). Chapter six and seven seek for answers to the empirical questions and are complemented by more recent explanations.

Financial institutions and their activities in financial markets represent the starting point in the course of this study. Most European financial institutions have profit-driven incentives to operate within modern financial markets. In addition, they also fulfill an important economic role within an economy. Financial institutions act as an intermediate between supply and

demand of capital. Because they are such important actors on capital markets, it is initially examined if and how financial institutions operate within their scope of activities. In comparison to classical industrial companies, financial institutions are subject to special types of risks. The Introduction to these risk types is an essential determinant for the further representation of the business model of a bank. It indicates the typical challenges for financial institutions in their regular business, but also shows problems that may be exacerbated during times of crisis. In addition, the latest development on the European banking market is highlighted. The main developments and changes since the 1950s are illustrated.

In the following chapter, the study illustrates the term "financial crisis". After defining the scope of a financial crisis, the link between financial crisis and financial stability is presented and so are the accompanied problems towards systemic risk. Financial crises cannot be narrowed geographically or by the level of economic development of the affected economies. However, financial crises have occurred repeatedly. Therefore a number of historical crises are presented, starting with the first modern global crisis in 1929 and several regional crises that occurred after the breakdown of Bretton woods. Furthermore, the development and the essential factors of the 2007/2008 subprime crisis are presented. In view of the increased occurrence of financial crises, they have comparable characteristics. These are summarized and an "ideal-typical" course of a financial crisis in developed economies is presented.

The fourth chapter deals with financial accounting and the development and setting of International Financial Reporting Standards. Based on the general purposes of financial accounting, it presents the evolution of International Financial Reporting Standards and the associated standard setting body, the International Accounting Standard Board. As the study addresses the implications of fair value accounting, the chapter considers the advantages and disadvantages of the use of fair value and gives reasons for the application.

Chapter five reviews the fundamentals of fair value accounting. Given the circumstance that fair value accounting is embedded in a rather complex structure, the principles and application of fair value accounting are presented in detail. As the majority of financial institutions' assets and liabilities are financial instruments, the associated standard on accounting for financial instruments is IAS 39 "Financial Instruments: Recognition and Measurement". This chapter provides guidance for the initial recognition, classification, subsequent measurement, and derecognition of financial assets and liabilities. Depending on their classification, certain assets are measured at (historical or amortized) cost or at fair

value. In addition, this section demonstrates the procedure of hedge accounting. Finally, the presentation and disclosure requirements under IFRS are identified.

The empirical analysis is conducted in chapter six. The chapter reviews related empirical literature and, based on the theoretical foundations raised in the groundwork, the hypotheses for the empirical part are developed. This study examines whether fair value accounting has significant implications on European financial institutions during times of crisis. First, descriptive evidence is provided on the magnitude of the data set. The subsequent research design requires two different research methods:

The first empirical study deals with the importance of fair value accounting for European financial institutions. It is examined, whether fair value accounting may potentially have significant impact on Europeans financial institutions. This analysis investigates the composition of financial institutions' balance sheets within the period 2006 to 2010. Therefore, it is applied an exploratory data analysis using a broad sample of actual financial institutions across the European Union. The dataset is based on consolidated financial statement information under IFRS.

In the second step of the analysis, the underlying determinates of fair value accounting are empirically analyzed using an ordinary-least-squared statistical model. The investigated companies are the same institutions as under the first examination. The dataset is based on consolidated financial statements under IFRS. The model provides empirical support for the implications of fair value accounting during the extraordinary events of financial crisis. Further analysis is conducted, subdividing the dataset into several groups, based on the individual companies' profile.

Concluding, chapter seven summarizes the main findings of this study. The chapter outlines possible implications of financial reporting and presents directions for further research. Furthermore, perspectives and limitations of fair value accounting are illustrated.

2. Banks, Financial System and Economy

"A bank is a place where they lend you an umbrella in fair weather
and ask for it back when it begins to rain."

Robert Frost

(Poet; * 26 March 1874 – † 29 January 1963)

2.1. Introduction to Banks, Financial System and Economy

At the beginning of the 21st century, banking institutions are playing a dominant role in the financial structure in Europe. They provide funds to the corporate, private and public sector, either directly in the form of loans or by assisting to raise funds from the financial markets in the form of equity or debt securities. In addition, banks have extended their business from traditional lending to modern capital-market transactions. On the investment side, banks offer deposit accounts in form of savings accounts and market investments in securities or funds. In modern economies a well-established financial structure is an important determinant of the efficiency and stability of the financial system. Moreover, the financial structure is essential to determine monetary policy transmission channels (Allen et al, 2008b, p. 32). This chapter reviews key features of banks and financial institutions as well as their different business structures.

Banking institutions provide liquidity to the corporate, private and public sector and are therefore subject to several types of risk. Therefore banks have developed certain strategies to monitor borrowers, using advanced models to measure, cover and price these market risks. The main types of risk exposure are presented in this chapter, which also provides an introductive overview of bank-specific laws and regulations, as well as the latest developments on the European banking market.

2.2. Financial System and Economy

The principal task of any economy is to allocate scarce material resources in order to produce goods and services needed by society. Any economic system must combine inputs

(land, labor, managerial skills, natural resources and capital funds) in order to produce outputs in form of goods and services (Rose, 1989, p. 6; Mankiw & Taylor, 2010, p. 255-271). Over the centuries, fundamental different economic systems[4] have been developed and tested. Yet, even if they are fundamentally different, their principal goals are the same. The main objective of any economic system is to create wealth for the nation, create employment opportunities for its people, and ensure sufficient nutrition (Lipsey & Chrystal, 2011, p. 5).

The complex task of allocating resources and producing goods and services is carried out in markets, where buyers and sellers meet. Trade can benefit all participants, and markets are a good way to coordinate trade. If there is some market failure or if the market outcome is inequitable, governments can potentially improve market outcomes (Mankiw & Taylor, 2010, p. 8-14). Basically, one can distinguish between three types of markets within an economic system: factor markets, product markets and financial markets. The factor markets allocate factors of production (land, labor, capital, managerial skills and other natural resources) and distribute incomes to the owners of productive resources. In the product markets the income receivers from the factor market can purchase goods and services (Rose, 1989, p. 5-7). Financial markets ensure that investors can invest their funds profitably, and borrowers can finance their expenditure for consumption and investment when their own resources are insufficient. Through the availability of funds, the financial system provides the ability to achieve substantial financial resources as used for example to finance large industrial plants. So far, the development of modern economies is closely linked to the development of their financial system (Hellwig, 2000, p. 3).

The financial system refers to the interaction of institutions, markets, regulations and contracts. Since state supervision and regulation varies between different countries, there are considerable differences in the respective financial systems. The next chapter provides an overview of the major players on financial markets, namely banks and financial institutions.

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[4] The most common systems are the market-based system according to the idea of Adam Smith, the centrally-planned economy according to the idea of Karl Marx, or a mixed model. See also Smith (1960), Smith (1962) and Marx (2000). Currently, most countries apply the market-based approach, albeit with a certain degree of government intervention (Lipsey & Chrystal, 2011, p. 16).

2.3. Banks and Financial Institutions

The term "bank" has its origin in the Old Italian word "banca". Several hundred years ago, Florentine bankers used such a banca, a desk or a bench, covered by a green tablecloth, for their business (Hoggson, 1926, p. 61; Hull, 2010, p. 19). Since then, many circumstances have changed although the essential function of banking remained relatively constant. A bank should interact as an intermediary between supply and demand of capital. This definition is understood as the traditional role of banks within an economy. Banks are financial institutions that are normally distinguished from other types of financial firms by providing deposit and loan products and other financial services (Heffernan, 1996, p. 15; Kidwell et al, 2013, p. 14-20). In most jurisdictions, banks are required to hold a banking license. This license is granted by the supervisory authority to undertake basic banking services such as accepting deposits and granting loans as its main activity. In Western countries, most of the banks are profit-oriented, private enterprises. Some banks are partly owned by governments, and in rare circumstances banks operate non-profit orientated. Banking business helps to ensure that economies function smoothly as they match up savers and borrowers in the most efficient manner possible[5]. This is one of the main reasons why governments are highly interested in a well-functioning financial system. Traditionally, banks generate their profits from the spread of interest paid on client's deposits and other sources of funds and interest received from outstanding loans as well as various fee-earning activities. Besides these traditional lending businesses, banks have extended their business by modern capital-market transactions such as underwriting, trading, and derivatives transactions (Choudhry, 2012, p. 5–6; De Haan et al, 2009, p. 205, 232; Edwards & Mishkin, 1995, p. 27). Banks could be summarized as financial institutions that earn their profits by providing transactions and intermediation services (Hubbard, 2005, p. 277). In most countries, banks are subject to a range of regulations and controls by the government due to their essential role within the financial system and the economy. However, the level of governmental regulation varies widely across countries (Barth et al, 2008, p. 18-19).

2.3.1. Economic Function of Banks

Besides their primary profit-orientated activities in most Western countries, banks fulfill several productive economic functions. As already mentioned above, a bank's basic function

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[5] The most efficient manner signifies the highest probable reduction in transaction and information cost (For example, Kidwell et al, 2013, p. 17 - 20; Mishkin & Eakins, 2012, p. 62 - 67).

is to act as an intermediary on financial markets to channel funds from sectors that have a surplus of liquidity to sectors that have a shortage of funds. Banks mediate between these two sides. In the same manner they (1) reduce transaction costs, (2) help to overcome information asymmetry and (3) normally undertake risk-sharing. Transaction costs are the time and money spent in carrying out financial transactions (Mishkin & Eakins, 2012, p. 62). Information asymmetry can occur ex ante and ex post and may result in information cost. These can be separated into four types: search costs, verification costs and the problem of adverse selection, monitoring costs, and enforcement costs (De Haan et al, 2009, p. 8; Heffernan, 1996, p. 18-19). Banks usually have a broader range of loans throughout their portfolio compared to a single money lender and thereby benefit from the effects of diversification (Choudhry, 2012, p. 41; Mishkin & Eakins, 2012, p. 65).

2.3.2. Banking Activities

Banking is a business, also commonly known as "the oldest profession on earth". Like in most businesses, market participants can be distinguished by their type of business structure (see chapter 2.4 Business structure of a bank) and different kinds of business activities that contribute to their profit. Buckley (2011) subdivides banking activities into:

- Retail banking (private individuals and small businesses)
- Business banking (middle-sized businesses)
- Corporate banking (large business entities)
- Private banking (wealth management to private individuals)
- Investment banking (activities in financial markets)

Additionally, many banks have increased their fee income in off-balance-sheet activities. This fee income is generated by trading financial instruments and exploiting transaction and information cost advantages on behalf of the client (Hubbard, 2005, p. 295).

Banks operate at least in one of the above-mentioned segments. As they are not limited to a single segment, most of the banks operate in several segments.

2.4. Business Structure of Banks

Banks can be distinguished into commercial banks, investment banks and central banks. The subdivision between commercial and investment banks originates from the US based Glass-Steagall act[6]. After the great depression in the 1920s, US law required that banks engage either in commercial banking activities or in investment banking activities to reduce conflicts of interest among business managers and encourage the smooth process of the financial system. Starting in the 1970s, financial innovations that allow commercial banks and investment banks to offer competing services have been gradually introduced. These innovations continued to steadily erode the separation between commercial and investment banks and finally, the Glass-Steagall act was repealed in 1999 and is nowadays no longer a legal requirement in US law. In most European countries this concept was never implemented and a distinction between commercial banking and investment banking was not maintained. A system that allows both types of business, commercial banking and investment banking, is called a universal banking system. Most European countries allow universal banks. Nevertheless, the terms "commercial banking" and "investment banking" are commonly used (Buckley, 2011, p. 46; Hubbard, 2005, p. 322, Kidwell et al, 2013, p. 543). Nowadays, banks offer both types of banking, either combined (known as universal banks), or separately, depending on their respective business strategy. The following section describes the different types of banks in more detail.

2.4.1. Commercial Banks

Commercial banks are profit-maximizing institutions that provide a wide variety of financial services, including retail banking, business banking and corporate banking. Commercial banks mainly accept deposits and make loans, offering risk-sharing, liquidity, and information services for savers and borrowers. Savers benefit from the risk-sharing due to banks' diversified portfolio of loans; borrowers can obtain funds to finance their investments (Buckley, 2011, p. 46). The primary source of income is interest earned on loans and investment securities. Additionally, commercial banks generate fee-based income. The primary expenses are interest paid on deposits and borrowed funds as well as production costs, mainly salaries and employee benefits (Kidwell et al, 2013, p. 383-410). Moreover, commercial banks have to cover the risk of not being paid back (default risk).

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[6] The Glass-Steagall act was established in 1933 as a consequence of the great depression of the years 1930-1933. Investment banking activities of commercial banks were heavily blamed for many bank failures at that time. The Glass-Steagall act subsequently separated commercial banking and investment banking activities (Mishkin & Eakins, 2012, p. 496).

2.4.2. Investment Banks

Investment banks are financial institutions specialized in raising new debt or equity in the financial markets, trading and brokerage services, advising on corporate mergers and acquisitions, and act as private broker to the very wealthy. (Mishkin & Eakins, 2012, p. 584-595). They can interact on their own behalf or on behalf of clients. Investment-banking firms usually generate their income from fees charged to clients by directly raising money through issuing and selling securities in the equity and bond markets, by selling and buying of financial instruments, and through fees from advising on corporate finance transactions. In addition, many investment banks offer a wide range of other advisory services, such as development of investment exit strategies or reorganization, and corporate financial services, such as foreign exchange, commodities, and derivatives (Buckley, 2011, p. 47).

The rise of investment banking in the last three decades has several drivers. Since the 1980s, commercial banks and investment banks have entered into competitive conflict, especially in the United States where the Glass-Steagall act was the legal barrier between these parties. Investment banks offered direct credit-market transactions, such as commercial papers, through the commercial banks' largest and most profitable clients, making the classical commercial bank loans obsolete. As a result, large commercial banks in the United States strove to break down the legal barrier, which finally happened in 1999 with the passage of the Financial Service Modernization Act (U.S. Government Printing Office, 1999; Kidwell et al, 2013, p. 543). The removal of Glass-Steagall was followed by a significant trend of acquisitions of investment banks by commercial banks. Some European banks also followed this trend and acquired investment banks[7] (Mishkin & Eakins, 2012, p. 585).

Another driver of growth of investment banking has been technological progress. In particular, the multiple use of information technology allowed the investment banks to create their own global information networks with a rapid exchange of information and money or cash flows. Further drivers were the wave of privatization of former state-owned enterprises, the expansion of foreign exchange markets and less exchange controls, as well as the extensive application of derivative instruments (Buckley, 2011, p. 47-48).

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[7] For example, Deutsche Bank spent large amounts of money to acquire Bankers Trust with the intention to establish its own investment banking arm (Mishkin & Eakins, 2012, p. 585).

2.4.3. Universal Banks

Mainly due to the appearance of universal banks and consolidation within the financial service industry, a large and increasing number of banks have become diversified financial institutions. The concept of universal banking is characterized by operations in most or all financial services under a single, largely unified banking structure. Most of these banks are organized into bank holding companies to engage in a wide range of business activities and achieve geographic expansion, to offer additional nonbanking activities through affiliated companies, and reduce their taxes (Kidwell et al, 2013, p. 412). Besides traditional commercial banking activities, financial services offered may include insurance, intermediation, brokerage, investment banking and asset management. Similarly, classical financial services institutions (e.g. insurance companies) have become more diversified and have started to offer banking services.

2.4.4. Central Banks

Central banks exist in parallel with the business banking sector. They are normally government-owned and have many functions and regulatory responsibilities, the most notable being (1) implementation of monetary policy, (2) control of money supply, (3) government's banker and bankers' banker, (4) manage foreign exchange and gold reserves, (5) setting of interest rate, and (6) regulating and supervising the banking industry[i]. Central banks are not profit oriented. In Europe, this task is executed by the European Central Bank (ECB) within the Euro zone and national central banks outside the Euro zone. The primary objective of the ECB is to maintain price stability within the Euro zone, which is the same as keeping inflation low.

2.5. Specific Role of Finance and Risk Taking

The financing function of financial institutions is a specialty and is more important for banks than for classical industrial companies. In contrast to non-banks, the financing function is part of the operating business and represents a major part of a bank's value chain. It serves not only to refinance the funds granted to customers and the other banking activities, it also represents an original source of revenue for financial institutions (Zessin, 1982, p. 55; Gischer et al, 2005, p. 75). Consequently, financial institutions generate value from both sides of their balance sheet, hence a bank's management is interested in a satisfactory composition of financial assets and financial liabilities on their balance sheet.

Financial institutions are principally profit-oriented and strive for profit maximization. As a specialty, banks are highly leveraged institutions operating with limited liability. Thus, they always have an incentive to engage in risky activities, since the upside gain could be larger compared to the smaller downside loss. This situation can be decomposed when financial institutions also operate with access to insured deposits. The presence of deposit insurance makes the depositors unconcerned about the bank's use of their funds. The insurance causes moral hazard problems by reducing the incentive of depositors to monitor the health of the bank in which they place their money. Instead, public authorities become responsible and have to undertake appropriate regulation. Appropriate in a way to control risk-taking proclivity of the financial institution while at the same time avoiding overregulation, since banks require a certain degree of freedom to adapt to changes in the financial marketplace (Kidwell et al, 2013, p. 456-460).

The operating business is achieved in line with four general principles of bank management (analogous to Mishkin & Eakins, 2012, p. 445):

- Pursue the continuous liquidity to cover all deposit outflows (liquidity management),
- structure an acceptable level of risk portfolio by acquiring financial assets and by achieving a well-diversified portfolio (asset management),
- achieve adequate funds at low cost (liability management) and
- optimization and acquiring of equity capital (capital adequacy management).

However, these principles are contradicting and cannot be fulfilled simultaneously. Furthermore, financial institutions have to take specific risk types into consideration while they carry out banking business. Typically they face three main types of risk: liquidity risk, credit risk, and interest rate risk[8].

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[8] Besides these three risk types, financial institutions also have to consider country risk, market risk, operational risk, legal risk, and reputational risk. In this context only the three main risks (liquidity risk, credit risk, and interest rate risk) are presented. For more details on types of risk see also: Bank for International Settlements (1997).

2.5.1. Liquidity Risk

The traditional business of banking is the provision of long-term loans that are funded by short-term deposits. As bank assets are less liquid than liabilities, banks face a lack of liquidity or the possibility of collective customer withdrawals in excess of the current funds on hand. Shifts in the banks' balance sheet on one side that cannot be compensated by the other side lead to a lack of liquidity and can therefore cause a bank trouble. This maturity imbalance is known as liquidity risk (Hubbard, 2005, p. 285).

In order to manage the liquidity risk a financial institution has to apply an active asset and liability management[9]. Financial institutions could also apply an easy strategy and hold just more reserves. However management has to take into consideration the tradeoff between the costs of excess reserves as insurance against deposit outflows and the reduction in risk exposure. The cost of excess reserves includes the sacrificing profitability to hold more liquid assets with lower returns. Normally, the liquidity reserve consists of highly liquid assets in form of cash, short-term marketable securities, or both. The cost associated with deposit outflows consist of (1) borrowing cost from other banks or corporations, (2) selling securities, (3) borrowing from the central bank, or (4) selling off loans, and probably receiving less than the full value. Theoretically, the optimum is achieved when the costs associated with deposit outflows are equal to the sacrificing profitability due to holding reserves (Hubbard, 2005, p. 285; Mishkin & Eakins, 2012, p. 448, Choudhry, 2012, p. 360-361).

2.5.2. Credit Risk

Credit risk is the risk that the counterparty might not perform according to the contractual arrangement. For instance due to a borrowers default, he might not be able to repay the loan principle plus accrued interest. The credit risk premium shall be reflected in the interest rate charged to the client and is based on the financial institutions credit risk analysis. This analysis assesses the credit risk by examining the borrower's likelihood of repayment, takes collaterals or pledged assets into consideration, and determines business conditions that might influence the borrower to repay the loan. Credit risk arises not only traditionally on loans, but also from counterparties in derivatives transactions and in payment and settlement systems. Financial institutions deal with credit risk in a continuous process by gathering

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[9] Further asset and liability management has to be undertaken in the context of market risk to match asset and liabilities (De Haan et al, 2009, p. 216).

information, monitoring counterparties, and by applying modern portfolio diversification. An appropriate way to gather information about a certain counterparty is to build up long-term relationships with the client (De Haan et al, 2009, p. 213–215; Hubbard, 2005, p. 288–291).

2.5.3. Interest Rate Risk

Interest rate risk is defined as the risk related to unfavorable changes in interest rates arising from fluctuations in market interest rates (De Haan et al, 2009, p. 305). Banks are particularly affected if long-term assets (disbursed loans or purchased securities with longer maturities) are funded by short-term liabilities (checkable deposits or short-term deposits). To handle the interest rate risk, banks have to compare the interest sensitivity of their different types of assets and liabilities. One common measure used is duration. Duration is the responsiveness of assets and liabilities market value related to changes in market interest rate.[10] Besides the concept of duration with its direct asset and liability approach, certain other strategies exist to manage the interest rate risk. Banks can reduce the interest rate risk through hedging instruments (financial futures and options), disburse loans with floating rates or enter into interest rate swaps transactions (Choudhry, 2012, p. 391–395).

Considering the types of risk and the importance of a smoothly working financial system within an economy, it seems obvious that there is a high interest of regulation and supervision in the financial sector. The following section provides an abstract of bank-specific laws and regulations.

2.6. Bank Specific Laws and Regulation

Banking regulation is one of the most severe regulations of all industry types. Banks are subject to several bank-specific rules and regulations because of their special risks taken, and their specific role within an economy (see above). Generally, supervisions are executed by the local central bank and/or by some government agencies. The nature and scope of banking regulation varies between countries, but the general motivation of banking regulation is almost homogeneous: the protection of consumers and companies from abuse by the industry, and stabilization of the financial system and the economy.

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[10] A formal definition of the duration is given in Hubbard (2005): p. 304-305 (Appendix to Chapter 13).

According to the Bank for International Settlements (1997), financial institutions have to deal with several types of risk. Besides the above mentioned credit risk, liquidity risk and interest rate risk, banks have to further consider country risk, market risk, operational risk, legal risk, and reputational risk. To cover all of these various risk types, financial institutions are required to hold a minimum level of own financial resources, i.e., capital. These minimum capital requirements serve as a buffer against unexpected losses and shall minimize the risk of failure. Hence, banks require sufficient liquidity to absorb potential losses, although high capital levels are costly for financial institutions (De Haan, 2009, p. 306–307). Kindleberger & Aliber (2011) and Reinhart & Rogoff (2008) have concluded that prudential supervision cannot eliminate the occurrence of banking crises, although the need for adequate, serious, competent, unbiased and independent regulation is obvious (Kindleberger & Aliber, 2011, p. 193–194, Reinhart & Rogoff, 2008, p. 342).

Another key component of banking regulation accomplishments is bank examinations. These examinations take into account the bank's activities and the respective risk profile in order to evaluate whether there is a need for additional capital requirements. Moreover, the review by the supervisor should take additional risks into account, that are not covered by basic minimum capital requirements, e.g. concentration risk, interest rate risk, legal risk, and liquidity risk. Furthermore, financial institutions should improve market discipline by increasing transparency. Therefore certain disclosure requirements have to be fulfilled (De Haan et al, 2009, p. 307-308).

Within the EU, the minimum capital requirements are based on an international set of capital standards, known as the Basel accords, established by the Basel Committee of Banking Supervisors. The latest version of International Convergence of Capital Measurement and Capital Standards document (Basel II) has been extended and is effectively superseded by Basel III. The Basel III concept builds on Basel II and was developed in response to the deficiencies in financial regulation of the banking sector revealed by the global financial market crisis (Bank for International Settlements, 2010; Bank for International Settlements, 2011).

2.6.1. Role of Government

There are several justifications for government intervention and its appropriate regulation and supervision forces. De Haan et al. (2009) and Hubbard (2005) have pointed out six reasons for the need of government regulation (De Haan et al, 2009, p. 299-330; Hubbard, 2005, p. 45-48. First of all, government regulation is required to protect property rights and to enforce contracts. These warranties are essential functions of economic activity. Property rights regulate ownership, the right to any benefit from property, the right to transfer or sell property, and the right to exclude others from property. If a contractual party does not fulfill its obligations according to the contract, an independent enforcement agency is needed.

Second, government regulation is intended to encourage transparency in order to allow investors to make better decisions on how to allocate their resources. In general, depositors and investors are less informed than financial intermediaries. Financial supervision aims to reduce this information asymmetry and consequently intents to reduce adverse selection[11] and moral hazard[12] problems in financial systems and increases the amount of available information. The setting and enforcing of accounting standards can be mentioned (see also 4.2. General purpose of financial accounting).

Third, governments should regulate and supervise financial institutions for operational reasons. Financial intermediaries have an incentive to take too many risks, mainly because of their divergent distribution of risk and rewards. High-risk investments generally result in higher revenues that accrue with the intermediary. In case of failure of an intermediary, the depositors or, in extraordinary events, even the general public bears a substantial part of the cost. Extraordinary events occur if a financial intermediary is "too-big-to-fail"[13]. In such a case, the general public reimburses the deficit, known as government bailout. The argumentation is based on the social costs of failure exceeding the private costs and economic consequences.

Fourth, depositors are often unable to evaluate the behavior of a financial intermediary and its integrity in the financial system. A proper evaluation requires extensive effort and technical knowledge. Therefore regulators require banks to hold reserves as a buffer for

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[11] A riskier financial institution may provide more attractive offer to potential clients.
[12] After collecting funds from customers, a financial institution may increase the risk.
[13] The discussion whether an intermediary is "too-big-to-fail" is controversial and appeared increasingly after the failure of Lehman Brothers in 2008. Further recommendable reading: Stern & Feldman, 2004.

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anticipated and unanticipated deposit withdrawals. Additionally, depositors are protected by a deposit-insurance system. These safety processions aim to give confidence and prolong a possible bank run. A bank run is known as an event where depositors lose confidence in their banking institution and the value of the bank's underlying assets and therefore withdraw their deposits. Often, the reason for a loss of confidence is bad news. Furthermore, bad news about one bank can snowball and may affect the stability of the financial system as a whole. A bank run can cause heavy damage to a financial system.

Fifth, the government promotes stability even under inconvenient circumstances, such as during a banking or other crisis, that generally originate in a lack of confidence. The government ensures that banks have access to adequate liquidity by serving as a banker's bank, or "lender of last resort". The lender of last resort serves as the ultimate source of credit to banks, especially during a panic or times of crisis.

Sixth, governments are responsible to ensure competition. There are many ways in which financial institutions or financial infrastructure may exert undue market power. In Europe, the competition policy is based on the Treaty of Rome that, for instance, prohibits banks to directly or indirectly fix purchase or selling prices; limit or control resources, markets, or investments; share markets or sources of supply; anti-competitive mergers (Treaty establishing the European Economic Commission, 1957, Article 85). Therefore, competition policy should ensure effective competition to protect customers and avoid the formation of monopolies or oligopoly. (De Haan et al, 2009, p. 8-12 and p. 299-330; Hubbard, 2005, p. 310-331).

2.6.2. Supervisory Structures within the EU

The organizational structure of regulating and supervising is undergoing modification in most EU member states. All countries used to have separate supervisors for banking, insurance, and securities. The increased appearance of universal banks and financial conglomerates and the converging of financial products removed the dividing lines between financial sectors. As a result, cross-sector models of supervision have emerged with and without central bank role on a national level (European Central Bank, 2006a, p. 2-4; Schoenmaker, 2005, p. 398-456).

Within the pan-European regulation and supervision, a key element is the appropriate level of (de)centralization. The current system is based on the above-mentioned principle of home-country control combined with minimum standards and mutual recognition (De Haan et al, 2009, p. 304). National supervisory agencies are in charge of the supervision, but they co-ordinate their activities through European supervisory committees. As the European financial landscape is integrating, so do the supervisory authorities. Different proposals to establish a European structure of financial supervision have been released and are being discussed in EU-wide supervisory committees. The three main proposals of a European supervisory structure are (Fonteyne & Van der Vossen, 2007, p. 199-237; Schoenmaker & Oosterloo, 2008, p. 337-354):

- Lead supervisor for the supervision of cross-border banking groups
- Single EU supervisor either for all EU banks or only for the large cross-border banking groups
- European System of Financial Supervisors, a central agency works in tandem with national supervisors.

2.7. Latest European Banking Evolution

After the disastrous economic events from two world wars and the instability in the inter-war period the world strived for recovery. The thirty years that followed the World War II were Europe's "Golden Age". The countries in Western Europe were generating the fastest growth rates[14] in their history. The financial sector naturally helped the economies to recover and to continue on the expansion, and benefited from this return (Cassis, 2006, p. 200; Di Vittorio, 2006, p. 309-320).

2.7.1. Banks and Financial Institutions in the Post-war Period

Nearly all of the European countries followed the objective to recover their economies after World War II. To reach their goal, basically all Western industrial countries applied the economic policies of Keynes: Countercyclical government intervention should stimulate economic growth and induce full employment. The characteristic varied from country to country, but the general trend was common through all market economies. Government

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[14] Between 1950 and 1973, the average growth in gross domestic product (GDP) in Western Europe grew at 3.8% per year (Tonilo, 1998, p. 256).

intervention was relatively ordinary at this time. Since the world economic crisis in the 1930s, substantial government intervention[15] was accepted in the private banking and credit system. State control measures were installed in the financial sector, which should improve the functioning of capital markets, ensure transparency, or protect against fraud. Governmental control or limitation of operations had a significant impact on the financial institutions by losing a part of their independence, or by nationalization (Cassis, 2006, p. 200).

The immediate post-war years were, especially in Europe, characterized by a phase of reconstruction. By that time banks and financial institutions had more of a serving role; their principal duty was to provide the economy with capital. The focus of the banking business was aligned to the needs of national corporate business clients. Afterwards, the general development of private client business was established. The level of banking services offered varied widely between the different countries (Bueschgen, 1993, p. 468).

Despite differences across countries, banks and the financial sector supported the overall expansion of the economies after the war period and benefited themselves. The reconstruction of the countries and the increasing integration of world trade over time led to a significant upturn in the general economy, hence in the financial sector. However until the 1960s, in some cases up to the mid-1970s, financial activities were still largely confined to national borders. Large movements of capital in the private sector did not take place, but were made by governments and, on a small scale, through the International Monetary Fund or the International Bank for Reconstruction and Development (Cassis, 2006, p. 201).

An increase in private international capital flow arose after the successful recovery of the economies. This process has been secured by the central banks of the developed countries, which committed themselves to cooperate under the IMF or other international bodies[16] and agreements[17]. Besides this cooperation and assistance of central banks, private institutions have created their instruments of international cooperation. This private internationalization of money and credit business is reflected by the Euro money market and Euro capital market or in the later years by the creation of International banking groups.

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[15] This development is reflected in the emergence of a state banking supervision, for example in Italy (in 1936), Germany (Banking Law in 1934, centralized supervision since 1962) or France (1945).
[16] For example the International Bank for Reconstruction and Development (IBRD) or the Bank for International Settlements (BIS) as an intergovernmental organization of central banks.
[17] For example in Europe: the Convertibility of the agreement between the major Western European countries, the European Monetary Agreement (EPU) or the European Customs Union.

2.7.2. Structural Changes - Banks and Market Structures in Transition

Towards the end of the 1960s and the early 1970s the Keynesian approach was losing ground in the economic policy. To some extent, the Western industry was moving in a direction not predicted by Keynes' theory and stimulated the critical discussion that there must be certain shortcomings. A number of economists[18] have contributed to the critical revaluation of Keynes logical foundations. Especially representatives of the neo-classical liberalism and free-market capitalism influenced the economic policies (Sandmo, 2011, p. 417).

Most of the industrialized countries were characterized by a phase of deregulation in the 1970s and 1980s. Public regulation of basic industries allegedly prevented a competitive productivity in an increasing open economy. Regulatory restrictions were systematically reduced in transportation, air traffic, communications and financial institutions. Meanwhile, governments preferred private sector solutions to problems of economic growth and development instead of state-operated, semi-socialist programs (Smith & Walter, 2003, p. 14). This applied process of deregulation and privatization was accompanied by the Treaty of Rome in 1957 (Treaty establishing the European Economic Community[19], 1957) and was enhanced by the 1985 White Paper "Completing the Internal Market" (Commission of the European Communities, 1985).

The effects of competitive capitalism became more noticable. Driving forces are numerous and include not only deregulation, European integration and privatization of state-owned enterprises, but also technical innovations, disintermediation and changes in demographics, which led to far reaching modifications (Sutcliffe, 1996, p. 205; Pierenkemper, 2005, p. 125). As a result, the latest development in the European banking market can be best described as a process of liberalization and integration (Allen et al, 2011, p. 19, 22–29).

In the late 1970s and throughout the 1980s, financial markets have undergone significant changes, during which numerous forms of banking regulations were abolished. Banking deregulation was controversial. On the one hand, banking regulation is established for

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[18] Notably the American economists Milton Friedman and Friedrich von Hayek, who had already become already a prominent critics of Keynes macroeconomic theories in the 1930s. See Friedman (1962), Friedman/Friedman (1979), Hayek (1944) and also Sandmo (2011): p. 326.
[19] This was the original long name. Subsequently renamed *Treaty establishing the European Economic Community* in 1993 (Maastricht Treaty) and then *Treaty on the Functioning of the European Union* in 2009 (Treaty of Lisbon).

consumer protection from fraudulent activities, to indirectly protect the financial system from the consequences of a bank run and to avoid large losses that could arise in case of institutional failure – imposed on taxpayers. On the other hand, expected efficiency gains were also intercessional reasons for banking deregulation. Many of the banking regulations were established as a response to the collapse of the financial markets in the 1930s and did not seem adequate for the changing environment of financial markets. Financial institutions had to face macroeconomic instability, financial innovations, increased domestic and foreign competition and technological progress. Thus, the relaxation of regulation could also be seen as a response to the permanently changing environment (Greenbaum & Boot, 1994, p. 635; Miles, 1994, p. 637-640).

Until the early 1970s, banking was largely a national affair. There were already certain transaction with cross-border nature, such as foreign trade financing and the resulting cash flows, as well as foreign exchange transaction. Furthermore, the Euro markets had already become an important capital market developed outside of national regulation. However, until that time the biggest banks in the world were mostly nothing more than "major players" based on the national market, predominantly unaffected by foreign competition (Rogge, 1997, p. 218).

Considering the upcoming developments of neo-classical liberalism in economic policy and the breakdown of the Bretton woods system[20] along with the establishment of floating exchange rates a new era of international monetary and financial relations was initiated. The deregulation of banking and other financial services was a worldwide occurrence and stood in line with a general change in economic behavior.

2.7.3. Global Banking and Financial Innovations

At the beginning of the 90s, the majority of European countries had highly regulated banking markets and financial institutions of each country were predominantly active on their respective home market. The European Union's objective to develop a single financial market was supposed to lead to further competitive structures in the European financial market. Financial integration was a more gradual process. In 1992, the EU created an

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[20] The Bretton woods agreement or so called Bretton woods system was a multilateral agreement that outlined rules and regulations for an international monetary system and exchange rate management. It was established in 1944 and was abolished in 1973 (see also section 3.4. Recent Financial Crisis in the Banking Sector)

internal market that guaranteed the freedom of movement of people, goods, services, and capital within the member states. A single license for financial institutions and home-country control were introduced along with the internal market. The European Commission strived for further financial integration in 1999 and launched the Financial Services Action Plan (FASP) with the purpose of removing any remaining barriers that limited the cross-border provision of financial services (European Commission, 1999). As financial supervision is executed by national supervisory agencies, the FASP additionally gives guidance of supervisory standards and practices to enhance supervisory standards across the EU (De Haan et al, 2009, p. 56).

Nowadays banking markets in Europe have grown together. Although there are still significant legal, regulatory, political, cultural, and tax differences across the member states (Kiswell et al, 2013, p. 428), there is no more closed market, separated by inter-regional influences. The European banking market has less national boundaries and has become more difficult to control and manage. The banking business changed from a gentleman-like banking without interrupting the competitors' business to a more aggressive offering of financial services, far beyond the once-known home market (Rogge, 1997, p. 219).

Several arguments for the justification of the European financial integration can be mentioned. The increased competition through the single market reduced financial barriers among member countries and is therefore expected to increase productivity gains. Furthermore, the creation of the Euro currency, information technological developments, as well as liberalization and deregulation of the banking sector have played an essential role in encouraging competition in Europe (Heffernan, 1996, p. 102; Kiswell et al, 2013, p. 427; Molyneux, 2003, ch. 10). Although the creation of the EU makes cross-border business easier, some of the financial structures in the member countries still remain diverse (Olgu, 2011, p. 152). The following figure presents the main sources that influence European banking institutions.

Figure 1: Main Source of Structural Changes on European Banks

The European banking market currently consists of 27 national banking systems. The national banking systems vary across countries in the number of banks, the concentration level, and the intensity of competition (De Haan et al, 2009, p. 204). Most of the European banking markets are still dominated by domestic banks, though there is a certain increase in cross-border banking business within Europe. Cross-border penetration[21] is a measure of the presence of foreign banks. The overall cross-border penetration across the EU member states increased from 11 per cent in 1995 to 20 per cent in 2009. Even if the degree of cross-border penetration is widely spread across the countries, a steady increase is observed across the board (De Haan et al, 2009, p. 220; Schoenmaker, 2011, p. 4).

In the summer of 2007, the outburst of the global financial crisis abruptly interrupted this long process of deregulation and increasing financial integration. A complex web of global capital flows with immense global interconnections within the financial sector spread the turmoil from the United States over major parts of the world with far reaching consequences (Forster et al,

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[21] The cross-border penetration is one possibility to measure the presence of foreign banks. It is defined as assets of banks from another EU Member States as a percentage of the country´s total banking assets.

2011, p. 5). The applied banking regulation methods emerged as not suitable and neither did some of the banking business models.

3. Financial Market Crisis

"The crisis consists precisely in the fact that the old is dying and the new cannot be born; in this interregnum a great variety of morbid symptoms appear."

Antonio Gramsci

(Writer, politician and political theorist;

* 22 January 1891 – † 27 April 1937)

3.1. Introduction to Financial Crisis

A financial crisis describes a situation in which the value of assets or financial institutions drops sharply. Usually, significant decreases in prices are solely made possible by previous disproportionate increases. A financial crisis is often associated with a panic, bank runs, and irrational investors' behavior, during which investors attempt to hastily sell off assets or rapidly withdraw their savings, expecting the value of those assets to decrease if they remain at the financial institution concerned.

In many cases, an overvaluation of assets precedes an emerging crisis. Investors' behavior can exacerbate the financial crisis. A rapid sale of assets may lead to lower asset prices, even below the actual fair value, and increase investors' expectations of failure with the consequence of more savings withdrawals. A crisis usually requires intervention in market activity to prevent or reduce the negative effects of a recession or depression.

Many economists are concerned with the phenomenon of financial crises. However, there exist only a vague consensus about the origin and the prevention of financial crises. Nevertheless, it is agreed that an healthy and stable financial system is of enormous importance for an economy. The worst financial crisis in history was the Great Depression in the late 1920s and early 1930s. This crisis affected the entire world economy and had severe consequences for society. Nevertheless, financial crises still occur today. Often they have minor impact than the experiences of the Great Depression. In the last decades, financial

crises occur more often in individual countries or regions. Unfortunately, major crises are not unlikely, as the financial crisis of 2007/2008 has impressively shown.

The global financial crisis that started in 2007 has been the most severe international economic crisis since the Great Depression. An era of increasing prosperity and growth came to an abrupt end. The financial crisis has resulted in a global recession that has led to economic troubles and high levels of unemployment. The economic costs are immense (Laeven & Valencia, 2012, p. 23-31). For the first time since the Great Depression, a situation arose through which the international financial system might collapse (Wilson & Grant, 2012, p. 1).

Many studies regarding the financial and banking crises have been published in the recent years. Nevertheless, there exists no definite explanation[22] of all the causes and effects of a crisis. In the aftermath of each crisis several hypotheses and interpretations are discussed. Basically, there is never a single determining factor or a specific *primera causa*, usually several factors play a decisive role at the same time. In addition, the extent and length of a crisis results from the combination of different causes. During the Great Depression, several individual crises had occurred. Discussions about the causes of the Great Depression continue to this day and are ultimately influenced by the respective political points of view.

The following chapter provides a definition of the term financial crisis and illustrates its connection to systemic risk in the banking sector. Subsequently, the importance of financial stability for the economy is presented. Financial crises usually have multiple causes. For this purpose, an overview of several triggers of financial crises is presented and various financial crises of the last century with their key drivers towards the crisis are elaborated upon. These considerations show that financial crises are regularly occurring phenomena. Despite various factors that trigger financial crises, there are indications of some commonality. These similarities are then displayed as a typical course of a financial crisis. In this context, the Minsky model is presented, which deals with crisis theory and the behavior of actors. Finally, an outlook on financial crisis and fair value accounting is provided.

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[22] Recommendable discussion of different views of the Great Depression; see Kindleberger & Aliber, 2011, p. 63-83.

3.2. Definition of Financial Crisis

Financial crises are major disruptions in the financial system that cause sharp contraction in economic activity, asset prices and firm failures (Mishkin & Eakins, 2012, p. 203). The effects of the financial crisis are primarily related to systemic risk. This means they are serious enough to have an adverse impact on the real economy (De Haan et al, 2009, p. 334). Mishkin (1992) defines a financial crisis as:

> A disruption to financial markets in which adverse selection and moral hazard problems become much worse, so that financial markets are unable to efficiently channel funds to those who have the most productive investment opportunities (Mishkin, 1992, p. 117-118).

Financial crises are a well-known problem having a long history in modern economics (Reinhart & Rogoff, 2009a, p. 34-47). However, they appear consecutive and the worst aspect of a financial crisis is that the costs of resolving a financial crisis can be substantial (Carstens et al, 2004; Caprio & Klingebiel, 2003; Honohan & Klingebiel, 2000; Kindleberger, 2000, Laeven & Valencia, 2012). The classical explanation of the occurrence of financial crisis is that they are caused by excesses, frequent monetary excesses, which lead to a boom and an inevitable bust (Taylor, 2009, p. 1-2). Financial crises affect countries at all levels of economic development and geographical locations (Laeven & Valencia, 2012, p. 9). Hence, financial crises often affect a large number of banks and financial institutions and can lead to banking crises. Often many banks of a certain region or even - through the increasing effects of globalization - many regions simultaneously get involved into a crisis.

Banking crises are a worldwide phenomenon. However, they are not a new occurrence. Laeven & Valencia (2012) have identified 147 country-specific banking crises between 1970 and 2011. During that period, some countries suffered one or two crisis, but only two countries (Argentina and the Democratic Republic of Congo) experienced four systemic banking crises each. The following figure provides an overview of the number of banking crises.

Figure 2: Number of Systemic Banking Crises in the period 1970-2011[23]
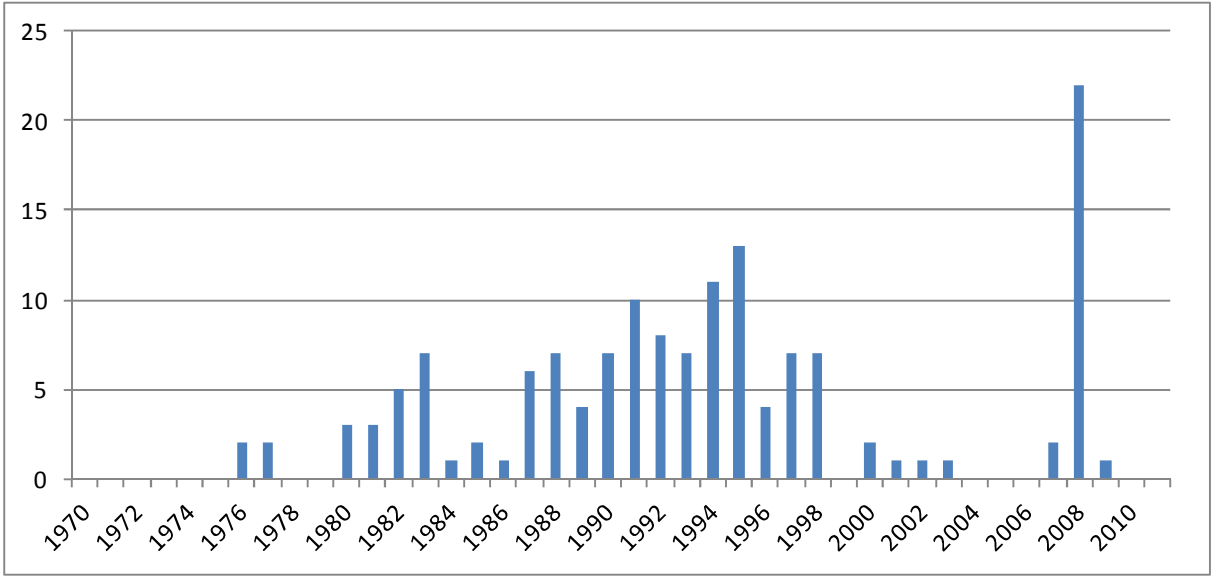
The increasing numbers of systemic banking crises arise at enormous costs. De Haan et al (2009) separated the cost between direct costs and several indirect costs that are related to the financial crisis. The direct costs include the losses of the shareholders, creditors, uninsured depositors, insurance funds and employees. But in most of the circumstances, the direct costs reflect only a small fraction in relation to the indirect costs. These entail substantial fiscal costs, as the government can be forced to reimburse a financial institution's deficit ("too-big-to-fail": Stern & Feldman, 2004; see also chapter 0 Role of government) and the restructuring costs of the banking and regulation system (De Haan et al, 2009, p. 340 – 342). In addition, banking crises can lead to a credit crunch. In such a situation only few lenders exist and/or borrowing rates are (too) high. This situation can depress economic activity and even make government intervention necessary to guarantee a minimum degree of liquidity on the market (Diamond & Rajan, 2009, p. 9-12). Furthermore, a reduction in bank lending in the reverberation of a crisis is likely to disrupt trade—and therefore economic growth—significantly (Reinhart & Rogoff, 2009b.p.11-12).

Financial crises can seriously harm modern economies and their costs extend to more than lost deposits. Regulators and supervisors try to avoid crises to assure that the financial sector operates smoothly without considerable interruptions. Thereby they are not only

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[23] Perennial crises are represented only in the year in the beginning of the crisis.

concerned with minimizing direct costs of financial crises; they also want to avoid the huge impact of indirect costs for the society. Therefore public authorities take great interest in maintaining financial stability.

3.3.   Financial Stability and Systemic Risk

Financial stability seems necessary for the smooth functioning of the key elements within a financial system. It is a situation in which financial markets and institutions function normally to allocate capital resources and risk (Bade & Parkin, 2011, p. 823). The term "normally" is unambiguously defined and could be best described as stability in the general level of prices, or as the absence of inflation or deflation (Duisenberg, 2001, p. 43). Financial stability is primarily related to systemic risk. Financial instability has the potential to trigger severe recession and mandated goals of monetary policy are undermined (Bade & Parkin, 2011, p. 823). An unstable financial environment arises from a loss of economic value or confidence in, and attendant increases in uncertainty about, a significant portion of the financial system. The consequences are serious enough to have an adverse effect on the real economy (De Haan et al, 2009, p. 334).

The objective to maintain financial stability has gained importance in recent decades. This development is mainly related to the liberalization and integration of financial markets (Bodie et al, 2011, p. 21). Several reasons are to highlight in this context: First, the financial system has grown faster than the real economy. This makes the financial system more vulnerable and even minor disturbances in the financial system could have significant repercussion to the real economy. Second, the financial system has become more complex. Financial innovations and technological progress make it much more difficult to assess financial risks and vulnerability of the system. Third, financial systems have become more interlinked with different types of (partly blurred) financial intermediaries and increasing cross-border integration (De Haan et al, 2009, p. 334).

In general, banks and financial institutions are very vulnerable to crisis as they finance long-term investments through short-term funding in the capital market. They carry a liquidity risk and rapid shifts in their balance sheet can have troublesome consequences. Under normal circumstances, this liquidity risk is rather small, as banks with a surplus of capital simply lend it to banks with a deficit and vice versa (De Haan et al, 2009, p. 208). However, in times of crisis the liquidity risk rises. An increase in uncertainty about the solvency of counterparties reduces the willingness of lending in the banking sector. In extensive cases, the market requires intervention of the central bank to not dry out completely. These effects also arise in

customer deposits. In economic systems without full deposit insurance, panic-based bank runs can be observed while in economic systems with full deposit insurance supervisors generally take over (partly) the management of banks in times of financial distress (Hubbard, 2005, p. 310–312; Bernanke & James, 1991, p. 52).

In the EU member states, the respective central bank maintains financial stability[24].The European Central Bank provides additional policies regarding supervision of credit institutions and stability of the overall financial system (De Haan et al, 2009, p. 366). Houben et al (2004) defined a general framework for maintaining financial stability. They recommend public authorities to take the following actions:

1) Continuously identify potential vulnerabilities at an early stage by monitoring and analyzing macroeconomic conditions, financial markets, institutions and infrastructure.
2) Take precautionary measures and assessments.
3) Undertake actions to reduce the costs of disturbance by presentational actions, remedial education and resolution.
4) Restore financial stability after a period of distress (Houben et al, 2004, p. 19-29).

For a long time, central banks had no standardized framework on how to analyze financial stability. To close this gap, the International Monetary Fund published a set of Financial Soundness Indicators (FSIs) in 2004. The central banks had to assess potential sources of risk to financial stability and vulnerability of the financial system. In addition, communicating on the findings is important to promote awareness of possible risks and vulnerabilities of the financial system (International Monetary Fund, 2004). Public authorities take great interest in maintaining financial stability. Besides their intrinsic motivation, external parties also support this process. The publication of financial stability reports by the respective central banks are intended to promote awareness of the topic in the financial sector and among the public (Oosterlo et al, 2007, p. 341).

The current regulatory structure is largely based on the financial crises that occurred in the 1930s. Most regulations were a response of the stock market crash of 1929 and the following Great Depression in the 1930s. While the financial markets changed over time, some of these regulations became obsolete and have been developed through reaction or were

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[24] Maintaining financial stability involves additional other institutions and shared responsibilities (i.e. European Central Bank, supervisory authorities, Ministry of Finance). The central bank is here presented as the maintainer of financial stability due to their responsibility for monetary policy making.

eventually completely abandoned (Fabozzi et al, 2010, p. 14). However, neither regulators nor supervisors could completely eliminate the occurrence of financial crises. They occur regularly, even if each financial crisis is unique and has its own characteristics. The following chapter will provide an overview on major crises in the banking sector.

3.4. Recent Financial Crises in the Banking Sector

Several financial crises occurred in the banking sector during the last century. The most known and probably most dramatic one was the financial crisis that began in 1929. The Great Depression was followed by a time of strong regulation of financial markets and protectionism, and by the Second World War. The post-war period was marked by a significant economic upturn until the late 60s. It was determined by a wide spread of Keynesian economic policy and an effort not to return to pre-war order. Economic and political cooperation was particularly strong in order to prevent the disastrous developments of the thirties and forties. Most of the industrialized nations implemented the economic policies advocated by Keynes' according to which anti-cyclical behavior of the government shall support growth and full employment.

Already in July 1944, a new financial order was installed among the world´s major industrial nations. 730 representatives of 45 countries signed the Bretton Woods agreement, named after an American mountain village in New Hampshire, where the meeting took place. The Bretton Woods conference[25] proceeded with the aim that all countries would have been better off in a world with free international trade, macroeconomic and financial stability and international cooperation without sacrificing internal policy goals (Krugman & Obstfeld, 2009, p. 513). In addition, institutions that govern international economic relations and avoid a repetition of the failings of the Paris peace conference should be established (Boughton, 2004, p. 3).

The Bretton Woods conference and the subsequently resulting events were implementing a par value adjustable peg system that worked for about a quarter century. It had to deal with many different problems during this time, but it also provided a framework of international cooperation, a development institution (IBRD[26]) and a multilateral liquidity facility (IMF loans). The stability of the fixed exchange rates and the cooperation via the IMF successfully

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[25] The "Bretton Woods Conference," as it has come to be known, was officially called the "United Nations Monetary and Financial Conference"
[26] The World Bank could also be mentioned in this context.

encouraged the world economy to recover from two world wars and the instability in the interwar period caused by competitive currency devaluations and protectionist trade policies (United States Department of State, 2013).

The Bretton Woods conference brought forth an international monetary management system, known today as the Bretton Woods system. It established a complete set of rules for commercial and financial relations among the ratified states. It was the first to govern monetary relations among independent nation states.

Each participating country agreed to keep its exchange rates fixed against the U.S. dollar and the United States itself tied the value of the dollar in terms of gold. All currencies were allowed to move within a band of +/- 1% from central parity or "par value".[27] Each member held its international reserves in gold or U.S. dollar and had at any time the right to sell dollar for gold to the Federal Reserve at the fixed exchange rate. The U.S. dollar was fixed to gold at $ 35 an ounce (Sanford & Weiss, 2004, p. 1). The system was thus a gold exchange standard. Besides gold, the dollar was the principal reserve currency, with an entirely new exchange rate system of adjustable pegs. Each country had the obligation to adopt a monetary policy that maintained the exchange rate. The IMF was created as a multilateral body charged with buffering international reserve positions of their participants. All members of the IMF formed a centralized pool of financial resources (gold and national currencies) in order to protect economies from rapid changes in their international reserve position. Under a classical gold standard, gold (reserve) flow into and out of countries could mean wide swings in domestic money supply with attended domestic adjustment problems (inflation or deflation) (Hammes & Wills, 2003, p. 4). If a country struggled towards temporary imbalances of pay-ments, the IMF had the ability to act as stabilization fund to cover temporary deficits while monetary and fiscal policy adjustment occurred. The IMF supported the respective country to bridge temporary imbalances of payment. Changes in exchange rate to U.S. dollar (and therefore to gold) could only be carried out with the IMF´s agreement. Such devaluations and revaluations should be an exception to correct a "fundamental disequilibrium"[28] in the balance of payments (Krugman & Obstfeld, 2009, p. 514-516). This system of fixed rates ended in 1973 when the United States removed itself from the gold standard and the major currencies began to float against each other.

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[27] This was later relaxed to +/- 1.5% and then further to +/- 2.5%.
[28] The term „fundamental disequilibrium" is not formally defined by the IMF, but it was intended to cover countries with severe balance-of-payments problems which could not be cured without devaluation or revaluation.

Since the early 1970s, the volatility in the prices of commodities, currencies, real estate and stocks increased. There was a strong trend towards deregulation of financial markets and increases in cross border capital flows, but an increased incidence of financial crises can also be observed (see also chapter 3.2 Definition of financial crisis). Certain evidence exists that banking crises occur in waves as banking crises often affect other regions (Kindleberger & Aliber, 2011, p. 273–296; Reinhart & Rogoff, 2009a, p. 141-173, Leuven & Valencia, 2012, p. 10). Kindleberger & Aliber (2011) have identified four waves of financial crises during these decades. Each wave was followed by a recession. The economic downturn caused by the latest wave, the financial crisis that started in 2007, was the most severe with the strongest global impact since the Great Depression of the 1930s (Kindleberger & Aliber, 2011, p. 3).

The first wave arose in the early 1980s when Mexico, Brazil, Argentina, and ten other developing countries defaulted on their US dollar-denominated bank loans. The second wave occured in the early 1990s. A bubble in real estate and stocks imploded in Japan and three Nordic countries. The third wave began in 1997 and is known as the Asian crisis. Thailand, Malaysia and Indonesia were initially involved, but rapidly spread the turmoil to other economies. The latest wave began in 2007 when the bubble burst in real estate in the United States, Britain, Spain, Ireland, and Iceland.

Each wave of financial crisis was accompanied by a wave of credit bubbles. The indebted-ness of similar placed groups or borrowers increased at a rate two or three times higher than the interest rate for three, four, or more years. Usually the loans are used to acquire real estate (Kindleberger & Aliber, 2011, p. 1). The following chapter describes in a condensed form the essential aspects of financial crises in chronological order. Before the four waves of financial crises are described initially is the most severe crisis is presented, known as the Great Depression.

3.4.1. First Modern Global Financial Crisis (1929-1933)

The Great Depression was economically considered one of the most momentous events of the 20th century. Precisely defined, it was not a single crisis, rather the concurrence of several partial crises. The Great Depression was the first financial crisis suffered by the world capitalist system, which affected many areas of the globe at the same time.

In the late-1920s and the early-1930s, several stock markets, banking and monetary crises occurred in the industrial countries. During that time, on average one financial crisis in all industrial countries occurred each year. Over the years, the frequency of financial crises increased but still the industrial countries remain able to cope with the respective phenomenon. The financial industry was scarcely regulated by that time. The culmination of financial crises started in 1930 when more than 16 countries experienced banking problems at the same time in their economies (Bernanke & James, 1991, p. 51). This global banking crisis was the beginning of several crises that finally led to the Great Depression. The Great Depression, the "mother of all financial crises", had massive impact, on account of its duration and its effects, in comparison to previous crises that marked this period. It represented the most serious economic crisis of the twentieth century including a massive drop in production, the collapse in world trade and a dramatic rise in unemployment. The Great Depression of the early 1930s occurred in several stages: a stock market crash, bank panics, worsening of asymmetric information problems, and debt deflation.

The stock market crash of October 1929 as examined by White (1990) was a consequence of the American boom of the years 1925-1929 that included a rapid rise of the New York stock exchange. Up to 1929, the United States were in an boom phase, including an expansion of credit supply, substantial growth, a rise in real incomes and money stock, and a stock market boom that reached bubble proportions (Buckley, 2011, p. 254). In 1928 and in 1929, stock market prices doubled in the US market. The sudden rise of share prices developed its own dynamics and the distrustful opinion about foreign securities encouraged American funds to engage in national papers instead of holding foreign securities. This behavior contributed to an overheated market. The public confidence in the extreme level of stock prices started to crumble during summer 1929 due to the precursor of a recession, and prices fell at the beginning of October. The decline of industrial production led to an exit from the stock market. The following crash of this excessive speculation was primarily an American phenomenon, even if foreign banks speculated partial openly on the New York Stock Exchange (White, 1990, p. 76-79).

Figure 3: Dow Jones Industrial Average: 1928 - 1938
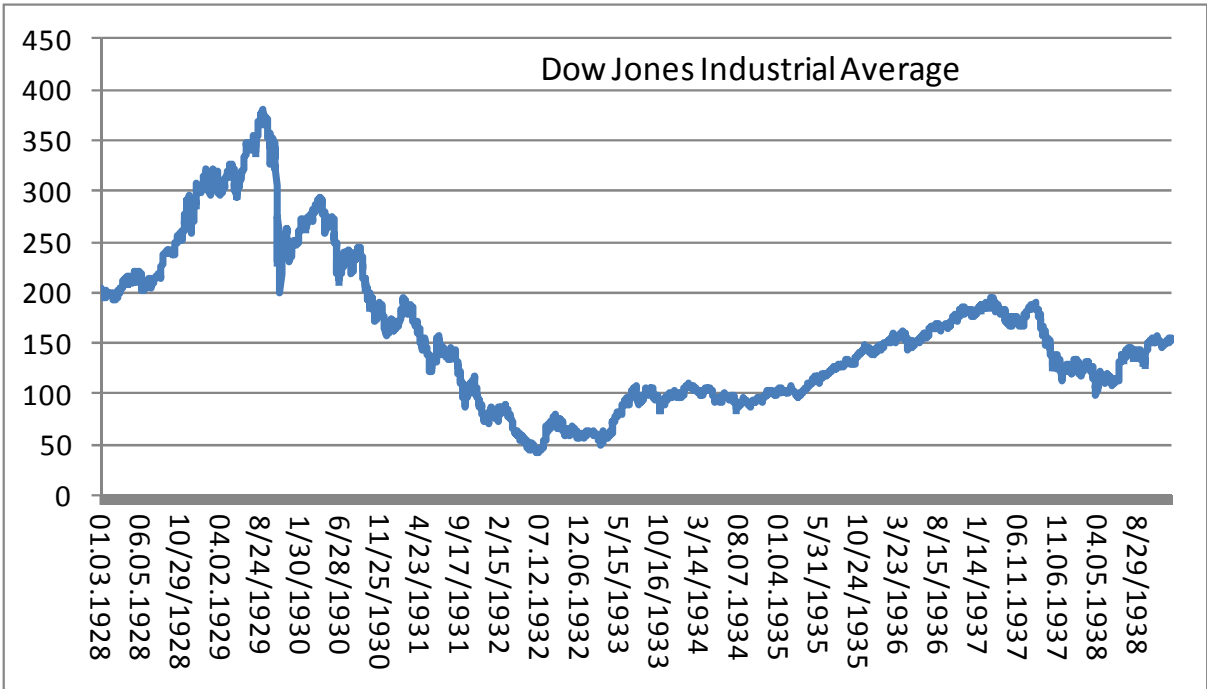
Source: measuringworth.com

As shown in Figure 3, the stock prices crashed in 1929, and continued to decline by mid-1932 to nearly 10 percent of their value at the 1929 peak. The Dow Jones Industrial Average fell from 386.10 on 3rd September 1929 to 40.56 on July 8th 1932. The market would not recover to nominal prices as of 1929 again until the 1950's. This crash had a huge impact on the minds of a whole generation. Most of the affected people forgot that more than half of the stock market decline had been reversed in the following years (Mishkin & Eakins, 2012, p. 209). The behavior of rapid sale also indicates the irrationality of investors during the time of the crisis, such as market overreaction and herding (Bernanke, 1983, p. 3).

The following Great Depression of the 1930s was not confined to the United States. The worldwide deflation of the early 1930s weakened borrowers' net worth. The tight monetary policy in the United States and Germany (the two countries most affected by the crises) hastened the crisis. Interest rate cuts were omitted; combined with a strict restraint of government spending and the attempt to get the money parity upright. This monetary policy dried up the investment potential. Additionally the banking sector reduced lending activities to many types of borrowers and charged much higher interest rates to protect themselves from credit losses. A reduction in lending opportunities and several bank failures were followed by a decline in economic activity and widespread unemployment. To this day, New York was the most dynamic financial center and fulfilled the role of the "world's banker" (Cassis, 2006, p. 181). The reduction in credit activity had significant consequences for the world economy.

Unable to find substitutes for bank loans (through sales of bonds or shares), many borrowers couldn't obtain credit and failed as a result (Hubbard, 2005, p. 337) Furthermore, the increase in uncertainty from unsettled business conditions worsened adverse selection and created moral hazard problems in the credit markets (Mishkin & Eakins, 2012, p. 210).

As a consequence of this financial environment, the general public had a liquidity preference and started to hoard money. The accumulation of cash withdrew the money from the economic cycle and so in countries with gold standard dropped the money supply dramatically since it was difficult for the government to control the quantity of money. Also outside the United States a sequence of bank panics and failures took place from October 1930s until March 1933. Bernanke & James (1991) examined that mainly countries with fragile banking systems, like Austria, Germany, France, many Eastern European, South American, and Middle Eastern countries, were more vulnerable to bank panics than countries with stable banking systems with a few large, well-diversified national banks. Notably Canada and the United Kingdom are to mention here (Bernanke & James, 1991, p. 52).

The financial crisis of the Great Depression was the worst ever experienced. At the time of the Great Depression, government intervention in the economy was very high. The United States erected an artificial structure of regulation that was in effect until the late 1970s and early 1980s, at which a process of financial deregulation was initiated (Kolb, 2011, p. 4). Nevertheless, many of today's regulatory principles are based on the observed events from the Great Depression. Each crisis leads to new regulation policies with the aim that the same type of crisis might not recur.

3.4.2. Latin American Debt Crisis

The debt crisis that originated in the early 1980s in Mexico was a major economic crisis with the potential to destabilize the international financial system. Several Latin American countries reached a point where their foreign debt exceeded their earning power and were not able to serve interest payments or repayment of its debt (Katada, 2001, p. 123).

During the two decades of the 1960s and 1970s, many Latin American nations, notably Brazil, Argentina, and Mexico, were given huge sums of dollar-denominated loans, mainly for industrialization to enable them to strengthen their economies. Many Latin American countries were principally commodity-producing and had soaring economies at the time with increases in GDP growth rates. Initially, these borrowers had relied on public institutions and took advantage of IMF loans for most of their external financing. After the breakdown of

Bretton Woods in 1973, commercial banks had to deal with flush of funds from oil-rich countries and were seeking for US dollar-denominated investment opportunities. As it was believed that sovereign debt was a safe investment with modest credit risk[29], the number of lenders increased dramatically. While the IMF loans were generally subject to certain rigid prerequisites, the commercial banks had no such prerequisites, making it easier for countries to receive external funding (Kindleberger & Aliber, 2011, p. 171-172; Miller, 2001, p. 679).

Between 1975 and 1982, the external indebtedness of Mexico and other developing countries increased at a cumulative annual rate of about 20 percent (Kindleberger & Aliber, 2011, p. 172). The interest on the debt amounted to 8 percent, with an increasing trend as the world inflation rose in the 1970s. The rising interest rates made it even harder to payback their debts (Schaeffer, 2009.p. 64, 86). A decline in industrial country growth, changing terms of trade and deteriorations in the exchange rate with the US dollar led to serious consequences. In August 1982, Mexico declared that it could no longer pay the principal on its foreign debt (Pastor, 1989, p. 90). As a reaction, commercial banks significantly reduced or halted new borrowings to Latin America countries. Much of Latin Americas borrowings were refinanced short-term. As Mexico defaulted, fresh refinancing of many other Latin American debtors was prevented by commercial banks, and thus a large part of the further borrowings became due (Miller, 2001, p. 681).

A series of steps were taken by governments and the IMF to avoid further economic collapse of the lending countries as well as the banks and lending institutions themselves. This included bridge loans, numerous restructurings, securitization of loans, and the acceptation of the lending countries to an intervention of the International Monetary Fund in their domestic policy (Katada, 2001, p. 123-125).

The financial crisis that started in 1982 became one of the most serious of Latin America. The debt crisis showed that several Latin American countries were borrowing higher amounts of money than they were able to pay back. Again, there was an interaction of several factors. On the one hand, poor domestic policy, particular fiscal expansion and exchange rate overvaluation (mainly the consideration of the IMF: Wiesner, 1985; Enders &

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[29] In 1982, Walter Wriston, Chairman of Citicorp, made the famous quote: "Countries don't go out of business....The infrastructure doesn't go away, the productivity of the people doesn't go away, the natural resources don't go away. And so their assets always exceed their liabilities, which is the technical reason for bankruptcy. And that's very different from a company."

Mattione, 1984; Sachs, 1985). On the other hand, the impact of external factors including the precursor of global recession and changing terms of trade (Cline, 1984; Taylor, 1988).

3.4.3. Nordic Banking Crisis (1987-1994)

The Nordic countries experienced an intense boom in the late 1980s, followed by a sharp contraction in the early 1990s. The following financial crisis led to a decline in real output, dramatic rise in unemployment and exploding government deficits[30]

Up to the mid-1980s, the Scandinavian countries had a very strict banking regulation. Banking institutions had the primary objective to provide affordable loans to the government and the real estate sector (OECD, 1992, p. 44). Banking profitability was stable, but rather low due to stringent restrictions on competition. Banking institutions had to apply strict minimum capital requirements and lending restrictions. These restrictions led to a credit rationing, which resulted in a positive selection process with virtually risk-free loans. In addition, the domestic market was protected from foreign influences through capital controls. Due to the strict regulations banking institutions had only little interest in additional private risk provisioning (Drees & Pazargasioglu, 1998, p. 22).

Through changes in the banking environment and a growing increase in the circumvention of bank regulation a process of deregulation was initiated. Finland, Norway, and Sweden abolished the credit quotas and the access to foreign capital markets was facilitated. However, the deregulation process was carried out in haste and the regulators in the Nordic countries missed to adjust the policies or adopted changes to slowly regarding risk controlling, risk management and capital cover to avoid incentives for financial institutions to take on too much risk (Drees & Pazargasioglu, 1998, p. 8). Denmark was an exemption, here financial stability was maintained due to a much smoother deregulation process and early interventions (OECD, 2000, p. 25-32, Lybeck, 2011, p. 305)

The overhasty deregulation and the simultaneous boom in the economy of the Scandinavian countries led to a rapid increase in the volume of credit. As the economic environment changed, high inflation rates and inflationary expectations combined with changes in the tax

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[30] For a detailed comparison of the costs in terms of lost output, industrial production and employment of the six deepest crises in Finland and Sweden during the period 1870-2000 see Jonung and Hagberg (2005).

system gave rise to very low real interest rates, in many cases negative ones. The result was a "financial hothouse" that made the financial system more vulnerable to shocks (Jonung & Stymne, 1997, p. 7; Battese et al, 1991, p. 1).

The boom began with an increase in foreign trade and thus the following recession showed strong implications to changes in foreign trade. On the one hand, prices for key exports fell, i.e. oil, paper and timber. On the other hand, fewer goods and services were exported through reforms in the USSR, a major export partners for the Scandinavian countries. The economic problems spread to the banking system and created banking crises in the respective countries (Drees & Pazarbasioglu, 1998, p. 22).

Banks and Regulators recognized the problems triggered by the rapid growth of credit volume, a distorting tax system and a simultaneous economic boom too late. As mentioned in Chapter 2.5 "Specific role of finance and risk taking", deposit insurance had switched off the control mechanism through banks runs. Depositors had no incentive to liquidate insolvent banks or to price the increased risk exposure of banks in their interest receivable. When the crisis was entirely visible, rapid government intervention and far-reaching restructuring actions reduced the real effects of the banking crisis (Jonung & Hagberg, 2005, p. 16-17).

In the following chapter, the banking crisis in Japan is discussed. The origins of the crisis have a certain similarity to the developments in the Nordic countries, mainly excessive extension of lending during a boom. However, the Japanese government has not succeeded to regenerate the banking system through targeted actions and the Japanese economy still suffers from the consequences.

3.4.4. Banking Crisis in Japan (since 1989)

In Japan, the economy was very successfully government-controlled for a long time through the ministry of international trade and industry (MITI) and the ministry of finance. The MITI had the power to protect and to develop certain industries and controlled the economy through tax incentives, government contracts and licensing. The ministry of finance had the task to ensure financial stability and to provide the industry with low-cost loans. The fundamental idea was to setup a long-term and social capitalism, instead of the short-term profit orientation of Western capitalism (Itoh, 1990, p. 140).
Mid-1980s, the Japanese economy was the world's largest exporter. Japanese high-tech set global standards. Capital exports were exceptionally high and the Japanese stock and real estate market grew rapidly (Karan, 2005, p. 312–317). As a decisive cause of bubble for-

mation Wehr & Ernst (1994) see the strength of the Japanese currency and the subsequent low interest rate policy since the mid-80s.

The Japanese currency remained undervalued for a long time as a result of protracted reforms. The relative cheapening supported thereby the export sector. Only in the spring of 1984, the Japanese authorities deregulated their financial market. A year later, under pressure from Western industrialized countries[31], an appreciation of the Japanese currency was adopted. The relative increase in the price of exports triggered a decrease in investment, which was countered by a low interest rate policy. As a result, the demand for credit greatly expanded and lead to an increase in real investment, but also increased speculation in stock and property markets (Wehr & Ernst, 1994, p. 482).

A part of the far-reaching problems of banking institutions resulted from a regulation exemption. In 1987, the Japanese regulators agreed with the Bank of International Settlement that national institutions had to fulfill the international capital requirements till 1993. However, Japanese banks negotiated a significant exemption. Banks were permitted to participate in up to 5 percent of other enterprises, and could consider up to 45 percent of the value of the shares they held as part of their regulatory Tier 2 capital. As Japanese enterprises were allowed to account for shares the higher amount of book value or fair value, an increase in the stock market multiplied the possibility of lending and vice versa (Gup, 1998, p. 36).

At the End of the 1980s, the stock market and real estate bubble was massive and even became bizarre[32]. In 1989, the stock market and the property market reached their peak. It did not follow a sudden crash, but rather a steady decrease of value over a long period of time. Stock prices declined by 30 percent in 1990 and another 30 percent in 1991. Subsequently occurred the reversal of perpetual motion machine with a decennial period of deflation, accompanied by an increase in credit defaults. Simultaneously the value of the real

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[31] The "Plaza Accord" had the target to appreciate the Japanese currency. As a result, the exchange rate decreased from 260 JPY/USD in 1985 to 122 JPY/USD in 1987.
[32] The market value of the land under the Imperial palace in Tokio was greater than the overall land area of California, United States. California is seven billion times larger than the grounds of the Imperial Palace. Overall, the Japanese real estate was twice the market value of United States real estate, even though the Japanese ground is 5 percent that in the United States. (Gup, 1998, p. 36). Enterprises were increasingly valued by their real estate instead of their future cash flow from operations. The overall market value of Japanese stocks was twice the market value of US stocks, even though Japanese GDP was less than half of US GDP (Kindleberger & Aliber, 2011, p. 173). Even golf club memberships of private individuals were granted as loan security, as the owner of the membership is participating in value of the real estate of the golf club (Chancellor, 2000, p. 315).

estate collaterals declined. The decline in real estate prices and stock prices meant that banks' equity shrank. The banks had to face liquidity problems (Kindleberger & Aliber, 2011, p. 176).

There are many comparisons of the banking crisis in Japan and the one that occurred in the Nordic countries in the 1990s. But the approach to resolve these crises and the actual outcomes vary widely. The Nordic authorities reacted relative rapidly while the reaction of the Japanese authorities was considerable slow. As a result, the crises in the Scandinavian countries were resolved relatively promptly. The banking crisis in Japan continued for more than a decade with much higher cost on the restructuring of their banking system (Honohan & Klingebiel, 2000, p. 5). In the early 90s, the Japanese government had not succeeded to promptly clean up the banking system with short-term and painful actions[33], as in the United States in 1934 or in the Scandinavian countries in 1990. Therefore, the foundation for a return of confidence in the banking system was missing (De Haan et al, 2009, p. 352; Karan, 2005, p. 317).

The different resolving approaches of the banking crises of the Nordic countries and Japan showed different experiences. First, the Nordic countries governments set up restructuring agencies that were established as a clean-up mechanism. These restructuring agencies aggressively supported the process of the disposal and the restructuring of defaulted or troubled loans[34] (Klingebiel, 2000, p. 2). Second, the Nordic countries had a high willingness to reduce the banking sector. Hoshi & Kashyap (2004) show that the total domestic assets of banking institutions in Finland fell by 33 percent between 1991 and 1995 and in Sweden by 11 percent between 1991 and 1993. While in Japan the total domestic bank assets shrunk less than 1 percent between 1993 and 2003[35]. Third, during the times of downsizing and loan disposal, the Nordic countries' governments supported their banking institutions with capital and the management typically was replaced. Such a treatment was not adopted in Japan (Hoshi & Kashyap, 2004, p. 3 & 11-12).

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[33] It's also a cultural issue, as Karan (2005) pointed out. The implementation of new rules is rather complicated and change comes slowly, e.g. auditors have the perception to be more loyal to their corporate clients than to uphold accounting principles (Karan, 2005, p. 318).
[34] The percentages of troubled assets transferred to restructuring agencies in Finland were 64% and in Sweden 86% (Klingebiel, 2000, p. 22).
[35] When the problem of nonperforming loans emerged, Japan's regulatory authorities implemented lax accounting principles that allowed banks a better presentation of its portfolio than it actually was and made possible to disguise part of their losses (Karan, 2005, p. 317).

The years of recession in Japan and their negative impact on the economic environment in the countries of East and South Asia is considerd as one of the reasons for the Asian crisis of 1997/1998. The following chapter gives an overview of the Asian crisis.

3.4.5. Crisis in Asia (1997/1998)

In the 1950s, the East Asian countries Hong Kong, Singapore, Taiwan and South Korea were among the world's poorest countries. In order to increase their economic growth, they integrated their economies into global trade. This implied that import restrictions were lifted, self-production of export goods was encouraged, necessary infrastructure was created, and simultaneously international capital transfers were facilitated. Due to the economic success of this policy the Southeast Asian countries Indonesia, Thailand, Philippines and Malaysia chose a similar export-oriented growth strategy (Krueger, 1999, p. 12-16).

The countries of East and Southeast Asia achieved an above-average economic growth for more than 30 years. The so-called Asian Tigers achieved integration into world trade by opening up their markets. The above-average growth rates were accompanied by frequent crises with partly large capital outflows, however, the respective governments managed relatively quickly to resolve emerging crises without significant cuts in GDP or economic growth (Khan & Reinhart, 1995, p. 20-24). The economies were characterized by a high capacity for reform and adaptability (Hubbard, 2005, p. 527).

The ongoing liberalization in the early 1990s and the rapid economic growth attracted many foreign investors. In 1993, stock prices doubled in most of the countries and continued to increase in 1994. Real estate prices rose significantly. The majority of the capital inflow went to finance investment in the real estate sector in Indonesia, Malaysia, and Thailand and to manufacturing in South Korea (Park, 2006, p. 56). However, prior to the crisis the basic conditions of the export success were worsening and economic growth of the Asian Tigers declined. Exports to the major trading partner Japan were reduced due to a long recession in the country. Real estate prices in the East and Southeast Asian countries slowed in 1995 and then reversed (International Monetary Fund, 1999). The continuous investment boom had created strong inflationary pressures, resulting in overvalued currencies and led to current account deficits across the region (Kindleberger & Aliber, 2011, p. 179).

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From 1993 to 1997, currencies of the East and Southeast Asian countries were effectively linked to the U.S. dollar. As the U.S. dollar gained[36] against the Japanese Yen and the European currencies, the Asian Tigers had to devalue their currency in order to avoid deteriorations in their terms of trade (Lindgren et al, 1999, p. 50; Corsetti et al, 1998, p. 7). This devaluation was not conducted. Only in the course of several speculative attacks in 1997, the overvalued currencies depreciated. Foreign investors underestimated the risk of currency devaluation and hedged themselves only slightly or not at all against falling prices. This was followed by a reassessment of risk in the emerging markets. Predominant reactions of the investors were rapid withdrawals of capital, followed by several banking crises and a recession across the countries (Adams et al, 1999, p. 63). After initial financial turmoil, market overreaction and herding caused a plunge of exchange rate, asset prices and economic activity (Corsetti et al, 1998, p. 1). The International Monetary Fund intervened with financial aid and restructuring programs and tried to reduce the negative effects of the monetary and financial crisis. Finally, there was a recovery in the emerging markets in East and Southeast Asia in the first half of 1999 (Adams et al, 1999, p. 84).

3.5.   Financial Market Crisis (2007/2008)

During the summer of 2007, increasing defaults on US sub-prime mortgages triggered severe disruption in the global financial markets, accompanied by a significant reduction in market liquidity and the supply of credit. Such financial crisis had already occurred in earlier decades (e.g. the Japan and the Nordic countries in the early 1990s, the Asian crisis in the late-1990s), but the main difference this time was its global dimension (European Commission, 2009, p. 8). Initially, the crisis appeared as a contained problem of a shortfall in payment of risky borrowers. But quickly the complexity spread across other credit segments and broader financial markets, so that sizeable parts of the global financial system became largely dysfunctional (Bank for International Settlement, 2008, p. 92).

The crisis intensified in September 2008 with the collapse of Lehman Brothers and severely hit economies around the world due to global interlinkages. These developments abruptly interrupted a more than two decade long process of increasing global financial integration and capital market deregulation around the world. Mishkin (2013) identifies three key factors that have significantly contributed to this crisis: Financial integration and financial

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[36] The U.S. dollar appreciated as a result of the G7 chord in April 1995.

innovations, principal-agent problems in the mortgage markets and asymmetric information in the credit-rating process (Mishkin, 2013, p. 234-242).

3.5.1. Financial Integration and Financial Innovations

In the two decades up to the subprime crisis, world economy was experiencing an increasing financial integration. Advanced and emerging markets became more accessible to a multitude of investors through the disappearance of capital restrictions, and more interlinked due to larger cross-border financial flows (European Central Bank, 2011, p. 8). Over time, the home bias of investments had decreased continuously. (Deutsche Bundesbank, 2008, p. 20; Eisenbeis & Kaufman, 2008, p. 169 - 170). During that period, new opportunities to diversify risk internationally were offered, to a considerable extent by new approaches of credit risk transfer. Financial innovations have made credit risks more tradable. This had increased the growth of credit and security markets as well as derivative markets. According to the Deutsche Bundesbank (2008) the total global financial assets (bank assets, stocks and bonds) rose from USD 106 trillion in 2002 to USD 194 trillion in 2006. The process of financial globalization accelerated and the world financial system is thereby growing much faster than the real economy. The enormous increase in global financial assets is mainly characterized by a substantial increase in traditional bank lending in emerging markets as well as a securitization boom in industrialized countries (Deutsche Bundesbank, 2008, p. 15-31).

The focus of the innovative risk transfer instruments are derivatives[37]. The use of derivatives has proliferated and so has interconnectedness of risk through the counterparties (Blundell-Wignall, 2012, p. 6). Derivatives are traded in two forms, on regulated exchanges or over-the-counter. According to the Bank for International Settlement (2012) the share of exchange-traded derivatives alone had tenfold between 1993 and 2007, up to a nominal value of USD 80 trillion at the end of 2007. At the same time, over-the-counter trading in the G10 countries[38] amounted to 525 trillion. Derivatives are predominantly entered as interest rate contracts, followed by foreign exchange contracts and credit derivatives. Credit derivatives are mainly credit default swaps (CDS). Nominal amount of CDS securities rose

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[37] Derivatives are financial instruments whose values are *derived* from one or more underlying assets, market securities or indices. The term "Derivate" is further defined in chapter 5.2.2 Derivative financial instruments.
[38] Data for OTC derivative exposure are collected on a regular basis for major banks and dealers in the G10 countries.

strongly from USD 1 trillion in 2001 to USD 58 trillion in 2007 in the G10 countries. (BIS, 2012, p. 6-11).

The huge increase in CDS is related to another financial innovation. A long-standing national goal in the United States was to enable home ownership for low income and minorities households. Within the private sector such an objective can usually not be achieved, even at low interest rates (Gorton, 2008, p. 2). However, advances in computer technology and new statistical approaches led to the evolution for a new class of risky residential mortgages, called subprime mortgages (Mishkin & Eakins, 2012, p. 211). Basically, the term subprime refers to borrowers who are just riskier. The designation as subprime is not related to any regulatory institution or rating agency. It rather represents an industry specific description.[39] Gorton (2008) characterizes subprime borrowers by

- insufficient funds for a down payment on the real estate;
- either no credit history or prior problems repaying debts;
- an inability to document income; and
- a lack of information or erroneous information (Gorton, 2008, p. 2).

Moreover, financial institutions were enabled to bundle several loans into standard debt securities, quantify the respective default risk, and subsequently sell the securities in the market. The process of securitization allowed subprime lenders to bundle a portfolio of sub-prime loans and also to mix the portfolio with other kinds of debts into financial products or bonds, called mortgage-backed securities (Buckley, 2011, p. 68; Mishkin, 2013, p. 234; Bodie et al, 2011, p. 17 - 18). Often individual securities are not sold to any specific investor as a whole, they are split into tranches. Each tranche has a different risk characteristic and appeals to the investors' preferences. The higher tranche has priority in receiving payments over a lower tranche (De Haan, 2009, p. 207). These tranches are rated by an external rating agency. High rated securities are worth more as they carry less risk. The securitizer aims to obtain the highest possible credit rating, giving him the incentive to make use of several different techniques of credit enhancement. These enhancements include subordination of certain tranches, over-collateralization, and creation of an excess spread or insurance against defaults (Kolb, 2011, p. 34; Mishkin, 2013, p. 235). The dependence of the rating has

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[39] In general, subprime borrowers have a numerical credit score (FICO – named after its inventor, the Fair Isaac Corporation) below 640, and at some point were delinquent on debt repayments in the previous one to two years, or they have filed for bankruptcy in the last few years (Gorton, 2008, p. 2-3).

direct influence on the price of the security. Moreover, many investors are encouraged, or even required, to invest in high-rated securities by their regulator (Kolb, 2011, p. 31).

A bundling of mortgages and combining them with other debt obligations made the original mortgage or other forms of credit lending no longer recognizable and limited the investors' ability to monitor the risk. The investor had to rely on the judgment of the rating agencies (Buckley, 2011, p. 69).

The originator of the assets transferred the pool of loans off his balance sheet to a special purpose vehicle (SPV). The SPV structure is used to provide the securitization and offered the tranches to investors, normally without any recourse to the originator (Kolb, 2011, p. 26-33; De Haan et al, 2009, p. 207). Moreover, the off-balance sheet treatment allowed the issuer to hide the extend of leverage of the securitization's firm and facilitated risky capital structures and under-pricing of credit risk (Simkovic, 2009, p. 253). The securitization process made it much easier for lending institutions to transfer their credit risk and to fund additional borrowings (De Haan et al, 2009, p. 343).

The investors of the tranches in mortgage backed securities, usually banks and hedge funds, receive principal and interest payments from the underlying mortgages and other loans (Buckley, 2011, p. 68). Since 2001, the United States had experienced a housing boom. Investments in sub-prime loans became increasingly interesting as the interest rate was relatively high while the default rate was very low because of the housing boom (De Haan et al, 2009, p. 342-343). With the endeavor to international diversification and because of the attractive risk-and-return profile, many foreign banks, hedge funds, pension funds, and insurance companies invested in these financial instruments. For this purpose, many banks established structured investment vehicles, borrowing funds by issuing short-term debt on the market and investing in mortgage backed securities to obtain a profit from the interest differential. As a result, the risk of the subprime loans spread via an elaborate network to other parts of the globe (De Haan, 2009, p. 343).

Besides the increase in financial integration and capital flows, two parallel financial innova-tions have been presented, the extension of subprime lending and the development of even more sophisticated methods of securitization. The security market has changed from one with pass-through securities to a market with tranches of securities that carve up the pay-

ments from the underlying portfolio of mortgage loans in partially extremely diverse and innovative ways.[40]

3.5.2. Principal Agent Problems and Adverse Selection

The process of securitization and the sale of the tranches to external investors led to principal-agent problems[41]. The mortgage brokers had no strong effort to evaluate the default risk of the borrower, since they were able to quickly sell the loans as mortgage backed securities (Berndt & Gupta, 2008, p. 22-23). Brokers acted as agents for the investors without much incentive to monitor their risks. Adverse selection problems occurred, as the more loans the brokers distributed, the higher their fee income was. This situation created the brokers' incentive to disburse mortgages to households that they could not afford, or to commit fraud activities by "assisting" the borrower with its mortgage application (Mishkin, 2013, p. 234-235).[42]

The underwriting of mortgage backed securities and the processes of structuring were high-margin businesses and the strong growth in the US real estate market was fueling the expansion (Buckley, 2011, p. 69). Normally, creators of mortgage backed security were urged to keep at least the first loss piece of tranches. However, they had weak incentives to remain in this position and hedged themselves with financial insurance contracts, called credit default swaps (Mishkin, 2013, p. 235). The holder of the credit default swaps received the payment of the underlying asset in the event of loan default or credit event (Anderson & MacKay, 2008, p. 575-578). Due to risky insurance contracts units of insurance companies were severely involved (Mishkin, 2013, p. 235).

3.5.3. Credit-Rating Process and Asymmetric Information

Credit rating agencies are individual companies that have the task to assign credit ratings for certain types of financial instruments. The credit rating shall provide information to potential

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[40] For a more detailed description of the process of securitization of subprime loans, see Kolb (2011): p. 16–37, Buckley (2011): p. 61–88, or Boodie et al (2011): p. 17–23.
[41] Principal-agent problem is a game-theoretic description of a situation. Conflicts of interest and moral hazard issues could arise when the principal and the agent have different interests and asymmetric information (Ross et al, 2004, p. 15-17)
[42] Fraud activities that have contributed to the financial crisis are not limited to brokers and principal agent acts. In the aftermath, corporate delinquency, mismanagement, or irregularity of the management of affairs came to the fore, see Anwar (2009): p. 35-46, Black (2010): p. 1–6, Denbeaux et al (2011): p. 6–29, or Wray (2011): p. 9–19.

investors about the risk of default (Cecchetti, 2008, p. 148). On the other hand, the credit rating agencies provide advisory services on how to structure complex financial instruments to receive the best credit ratings. Simultaneously they are rating these identical products (Mishkin, 2013, p. 236). Thus, rating agencies have a trade-off. If there is no rating there is no fee (Buckley, 2011, p. 70). Moreover, earnings from advising clients on the structuring of financial products reduce their incentive to provide accurate ratings. This behavior contributed to the sale of complex financial instrument that were far riskier than investors assumed (Mishkin, 2013, p. 236).

3.5.4. Monetary Policy and the Financial Crisis

Some economist have argued that the low interest rates of the Federal Reserve at the beginning of the decade have fueled the housing price bubble, and the subsequent raise of interest that led to the house price crash (Taylor, 2007, p. 465-466; De Haan, 2009, p. 343). Furthermore, since 2002 the capital flows into the United States have increased, which led to an excess supply of credit for the purchase of private and commercial properties (Kindleberger & Aliber, 2011, p. 274; interdependence of capital flows in general during times of crisis: European Commission, 2009, p. 17; Reinhart & Rogoff, 2009a, p. 8).

Figure 4: United States Official Interest Rates 2000 - 2008
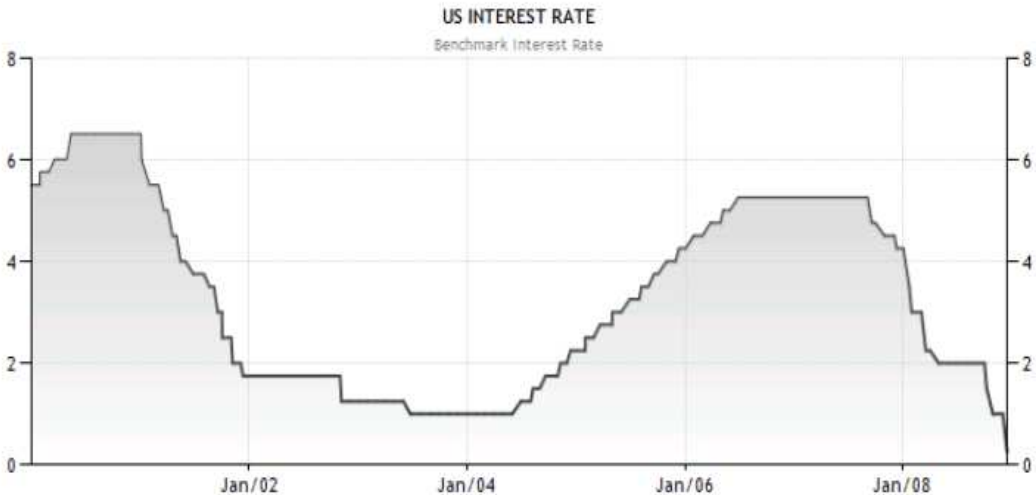
Source: Federel Reserve

After a three year period of abnormally low interest, the Federal Reserve began to raise the official interest rate from gradually 1 percent to 5.25 percent to cool down the booming economy and to keep inflation under control (Bordo, 2008, p. 3; Sinn, 2009, p. 57). The successive increase of the official interest rate since 2004 brought an increase in interest rates on loans. As a result, numerous households who received subprime loans could not pay their mortgage interest. Moreover, subprime loans were disbursed under the assumption of a steady increase of housing prices. In the second half of 2007, a massive surge of defaults occurred in the U.S. mortgage market as many subprime borrowers were unable to refinance their loans. This created a domino effect and the housing prices declined (Guse, 2009, p. 18; De Haan, 2009, p. 343). Sinn (2009) concluded that this trigger of the crisis cannot be condemned as the reason for the crisis. At some point, the structural causes had to come to the fore (Sinn, 2009, p. 57).

3.5.5. Further Development of the Crisis

The credit boom that peaked in mid-2007 was followed by a meltdown of subprime mortgages and all types of securitized products. The interbank market came to a significant slow-down. Banks had an increased risk aversion and started to be reluctant in mutual lending; as it was not clear to what extent other financial institutions were engaged in mortgage-backed securities. This led to a global liquidity crisis (De Haan, 2009, p. 344; Ivashina & Scharfstein, 2009).

The Fed and other central banks responded by flooding financial markets with liquidity. Fiscal authorities were dealing with the decline in solvency in the banking system following the template of earlier bailouts like the Reconstruction Finance Corporation in the 1930s, Sweden in 1992 and Japan in the late 1990s (Bordo, 2008, p. 2-3).

The crisis worsened in March 2008 with the rescue of the Investment bank, Bear Stearns, by JP Morgan Chase backstopped by funds from the Federal Reserve. The Fed agreed to take the losses on some of the wasted portfolio of Bear Steams (Kindleberger & Aliber, 2011, p. 263). The rescue was justified on the grounds that Bear Stearns was too-big-to-fail (Bordo, 2008, p. 4; Evans, 2011, p. 35). In July 2008, the next major event was a bailout and partial nationalization of two insolvent government-sponsored enterprises, Federal National Mortgage Association (Fannie Mae) and Federal Home Loan Mortgage Corporation (Freddie Mac). Both were institutions that facilitated the flow of funding for mortgage loans in the United States (U.S. Government, 2008, p. 2677; Congress of the United States, 2010, p. 3–9).

Subsequent problems in the US investment bank Lehman Brothers and the US mortgage lender Washington Mutual (WaMu) worsened the situation. The government felt that an example had to be set in an attempt to prevent a potential "bailout moral hazard" (De Haan, 2009, p. 344). In the absence of a private or public rescuer, Lehman Brothers filed for bankruptcy protection. The fallout of Lehman Brothers added a shock to the global financial system as the fears over counterparty risk turned into panic. The unwillingness to commit government money was perceived in the financial industry as a sign of no coherent government policy toward providing financial assistance to weakened large institutions. Moreover, the failure of Lehman Brothers turned the liquidity crisis into a massive credit crisis and resulted in a stock market crash (Kindleberger & Aliber, 2011, p. 87 and 264–271; European Commission, 2009, p. 8). Banks suffered losses on their holdings and sponsoring of mortgage backed securities. The subsequent reduction of bank capital led to capital shortfalls. In this predicament, banks could either raise new capital or reduce asset growth. Fresh capital was hard to obtain in a weakening economy, thus banks reduced their lending activities as well (Mishkin & Eakins, 2012, p. 453). The global interbank market ceased to function, and the crisis spread to Europe and to emerging countries (Bordo, 2008, p. 6; European Central Bank, 2009, p. 8 - 10). A variety of government actions was undertaken to promote liquidity and solvency in the financial sector. The United States and European authorities were eventually forced to rescue financial institutions to avoid a systemic meltdown (De Haan, 2009, p. 344 - 345; Kindleberger & Aliber, 2011, p.87 and 90-91).

The European Commission responded to the crisis with its "European Framework for Action" to coordinate the actions of the 27 member countries. The short-term plan was developed as a three-part approach to an overall European economic recovery plan. The objective was (1) a new European financial-markets architecture, (2) a framework for the recovery of the real economy, and (3) a global response to the financial crisis (European Commission, 2008, p. 2-9). In addition, several EU countries, such as France, Germany, Italy, Austria, the Netherlands, Portugal, Spain and Norway announced plans to recapitalize banks and to provide government debt guarantees (Oglu, 2011, p. 187). The crisis had also demonstrated the growing interdependence between the capital markets. The United States and Europe share common concerns and have mutual interest to solve the financial crisis and to avoid comparable future events. Major countries agreed to financial programs that counteract capital losses of banks. Governments provided their financial institutions with new capital or guarantees on toxic assets and programs to stimulate their economies (European Commission, 2009, p. 10; Oglu, 2011, p. 197).

3.6. Anatomy of a Financial Crisis in Advanced Economies

In the previous sections past financial and banking crises were discussed. They were characterized by a boom-bust-cycle. An excessive economic heyday followed a downturn in economic activity, sharp declines in asset prices and firm failures. The effects of the financial crises had a severe impact on the real economy. The crises thereby affected emerging markets as well as advanced economies.

The typical course of a crisis in advanced economies can be summarized as follows: One or more economies are experiencing an economic boom. The economic heyday is accompanied by a period of low interest and leads to an expansionary lending by the banks. At a certain point, the growth of the economy weakens. In this economic environment, a financial crisis may occur under the following conditions: (1) a previous introduction of financial innovation and liberalization of financial markets, followed by a mismanagement of the changing circumstances and conditions, (2) rise of asset prices such as equity shares and real estate above their fundamental economic values, resulting in an expansion of asset-price bubbles followed by its implosion, (3) or a general increase in uncertainty such as after the start of a recession, failure of major financial institutions or a crash in the stock market that causes an increase in financial frictions which in turn reduce lending and economic activity (Mishkin, 2013, p. 228-230; Minsky, 1982, p. 13-39).

As the business conditions are worsening, banks are facing higher loan losses by the increase in bankruptcies of borrowers. Usually, this situation is accompanied by deflation. The onset of deflation leads to two effects. On the one hand, the occurrence of deflation reduces the value of collaterals and on the other hand it reduces the value of the fixed assets. Financial institutions entering into insolvency or even rumors of a potential bankruptcy can lead to a banking crisis. If these factors are severe enough, they can lead to bank panic, in which several financial institutions fail simultaneously. Banking crisis occur mainly because of asymmetric information, which has an impact on the creditors of the banks and also the banks themselves. If investors fear the safety of their deposits, in the absence limitation of amounts of federal deposit insurance, banks are typically liquidated in bank runs. In a financial system with complete federal deposit insurance, bank runs do usually not occur. Insolvent firms are taken over by private or public authorities and are resold or liquidated. In addition, distrust among the financial institutions themselves may dry out the necessary liquidity in the market. The resulting decrease of financial institutions due to failure leads to a further decline of lending, investment spending and spiraling down the economy.

In some instances, an unanticipated decline in price levels may also lead to a further deterioration in firms' equity. As debt payments are typically fixed for long periods, a sudden decline in price levels raises the value of the borrowing firms' liabilities in real terms but simultaneously does not raise the real value of the firms' assets. In real term, the firms' equity declines (Mishkin, 2013, p. 231).

While financial crises are ultimately caused by breakdowns and exposures of structures and relationships, they can be accompanied and reinforced by "false consciousness" in the sense of missing or inadequate response to the crisis management. The strategy of the regulatory authorities mainly determines the duration of the crisis. A tough approach of the regulator, in which insolvent banks are quickly liquidated, creates new confidence and a foundation for the banking system. Generally, the damage of the crisis will be contained. If the regulator delayed its intervention or if the regulator was not yet in a position to assess the full extent or to change the situation appropriately, the crisis often got worse.

The latest financial crisis also brought back some of the ideas of Minsky (1982) into economic policy discussions (Minsky, 1982, p. 13-39; Whalen, 2007 p. 4-11; Wray, 2008, p. 2-8; Silipo, 2010, p. 443-451; Kindleberger & Aliber, 2011, p. 35-38). He argued that the financial system in a market economy is unstable, fragile, and prone to crisis. A confirmation of his theory is nowadays known as the "Minsky model": Changes in the supply of credit are pro-cyclical and increase during a boom phase and decrease when the economy turns slow. During a long, stable upswing phase, the investors become more optimistic. They raise their estimates of profitability and become too daring. While they try to achieve even higher returns, they enter higher risks without adequate safeguard. Hedging does not seem necessary, since in the past everything went well. At the same time, the lenders' assessments of the risk of individual investments and their risk averseness decline. This creates a bubble, which bursting seems inevitable. When the economy shrinks, investors and lenders become less optimistic and more cautious. Minsky believed that the pro-cyclical supply of credit leads to fragility in the financial system and increases the occurrence of a crisis. The Minsky model[43] has great explanatory power to prior crisis in the United States and in Western Europe, the asset price bubble in Japan and the latest real estate bubbles in the United States and some European countries between 2002 and 2007 (Kindleberger & Aliber, 2011, p. 26-27; Yellen, 2009, p. 1-16). However, Minsky's theory stands in

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[43] Also known as "Minsky Paradox", "Minsky-Moment", "Minsky-Collapse" or "Minsky-Meltdown".

contradiction to the neoclassical theory, and there are some critics (Kindleberger & Aliber, 2011, p. 33-34, Palley, 2010, p. 10-24)

3.7. Financial Market Crisis and Fair Value Accounting

Since 2005, the International Financial reporting standards are applicable for companies listed at European securities markets in their consolidated financial statements (see also chapter 4.8 International Financial Reporting Standards in Europe). With the application of a set of international accounting rules, European countries also created new prospects such as the accounting of financial instruments at fair value. During the latest global financial crisis, the subject of accounting for financial instruments generated an unusual amount of attention in politics and media. There has been the assertion that the current financial accounting principles had contributed to the instability in the financial markets during times of crisis. There was some evidence that the application of fair value accounting lead to inappropriate write-downs. These write-downs were the result of inactive, illiquid or irrational markets that resulted in values that did not reflect the economic value of the investment (Ernst & Young, 2012, p. 2851). In this course arguments were put forward that the fair value increases the earnings volatility and unfolds pro-cyclical effects, thus destabilizing the economy (Benston et al, 2003, p. 22-28; European Central Bank, 2004, p. 6-11; Huerta de Soto, 2009, p. 2-4; Gschrey, 2010, p. 5-10). This presentation is controversial in economics, and the proponents of fair value accounting rather insist on the usefulness and relevance of information (Barth, 2004, p. 330; Laux & Leuz, 2009, p. 8-13). However, during the last crisis in 2008 due to political pressure the rules for fair value accounting were softened (IASB, 2008b). [44]

However, before this study investigates the impact of fair value accounting to the European banking industry during the latest financial crisis, the meaning and usefulness of financial reporting is discussed in the following two chapters and subsequently the current regulations on accounting for financial instruments under the International Financial Reporting Standards are presented.

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[44] The discussion of fair value accounting is presented in more detail in chapter 4.9 "Fair value accounting", and the development of IAS 39 is illustrated in detail in chapter 5.3 "Overview and development of relevant standards".

4. Financial Accounting and Fair Value Accounting

"We must always change, renew, rejuvenate ourselves;
otherwise we harden."
Johann Wolfgang von Goethe
(Dramatist, novelist, poet, & scientist;
* 28 August 1749 – † 22 March 1832)

4.1. Introduction to Financial Accounting

The following chapter provides an overview of the general purposes and implication of financial accounting. The minimum requirements of an accounting system will be presented followed by the connection to the international standard setting body. The evolution of international standards is shown and it shall be given a better understanding of the evolution of international financial reporting standards and the objectives of the standard setting body as well as their interaction with the European Union. Moreover, an insight into the application of international financial reporting standards in Europe will be granted and the developments on a fair value measurement discussed.

4.2. General Purpose of Financial Accounting

Accounting is applied to grant the users insights into the economic situation of the company. In a more general sense, accounting provides information relating to business activities. It is customary in the literature and practice to separate accounting into two broad areas: management accounting and financial accounting. Management accounting provides information to the management and is therefore internally used by the enterprise, either for ex-post monitoring of performance or for ex-ante decision-making. The general purpose of financial accounting is the process of summarizing financial data taken from an enterprises accounting records and publishing it in the structured form of annual (or more frequent) reports for the benefit of a wide range of users outside the company (Sutton, 2000, p. 2). External users and addressees of financial accounting information could be investors, creditors, suppliers, customers, employees, competitors, financial authorities and the general

public. Between the reporting entity and the aforementioned parties exists an asymmetric information structure as the reporting entity has more knowledge about their own business activities than the outstanding parties do. The fundamental purpose of providing financial information to the external users and addressees is a necessary condition to build up rapport and confidence and relieve the asymmetric information (Pellens et al, 2011, p. 4). The external users and addressees can use the financial information about the financial position, financial performance and cash flows of an entity to make better-informed decisions in providing resources to the entity.

To achieve comparable and reliable financial information it is necessary to standardize the accounting rules. To an entity standardization usually represents a constraint, but there are certain considerations that justify the regulation. Standardized accounting rules provide economic efficiency to an economy by the impact on overall economic welfare. It reduces the possibility of market failure and therewith incorrect or poor allocation of scarce resources (Eierle, 2004, p. 21). A further reason for the standardization of accounting rules are the above mentioned asymmetric distributed information. An investor has generally inferior information to the management and is therefore particularly in need for protection. Hence the asymmetric information can be reduced by consistently applied rules.

Regulation of financial accounting principles are determined by different regulatory sources[45] and regulate, assist and inform about the prevailing purpose, the scope, the matter of detail and the interpretation of financial accounting principles. Regulatory financial reporting should ensure that all companies present similar transactions in a consistent fashion. Therefore, most of the countries have established a respective set of national financial accounting principles. They rely virtually on the same fundamentals, but significant distinct characteristics in accounting treatment exist between countries due to historical, cultural, scientific, legal and institutional factors (Choi et al, 2004, p. 48). This accounting diversity can result in significantly different amounts/figures in the company's balance sheet or income statement.[46] This results in information from different countries that are not necessarily understandable or comparable (Pellens et al, 2011, p. 37).

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[45] Regulatory resources could be distinguished between regulation by law, regulation due to the standard setter or due to recommendations. See also Ebbers, 2001, p. 29-30.
[46] Accounting diversity can cause problems when preparing consolidated financial statements, to get access to foreign capital markets, to reduce the comparability of financial statements and a lack of high-quality accounting information. See also Doupnik & Perera, 2012, p.23-55.

The globalization has paced the internationalization of trade and investments in recent years. Goods, services and capital are increasingly traded across borders. Multinational enterprises and transnational investments have led to a demand for internationally comparable financial reports. This has led to an international trend towards harmonization of accounting standards and elevated the pressure for a single set of high quality international accounting standards.[47]

4.3. Evolution of International Accounting Standards: IFRS Foundation and International Accounting Standards Board

The European Commission (EC) had the objective to harmonize financial accounting information across the member states, thus making financial statements comparable, transparent and reliable financial information. For this purpose the EC published on 25 July 1978 the fourth council directive (European Commission, 1978) regarding the treatment of annual accounts of certain types of companies and five years later the seventh council directive (European Commission, 1983) on 13 June 1983 regarding the treatment of consolidated accounts[48]. The European accounting directives provided a minimum level of harmonization to reduce differences between the respective accounting requirements to ensure a higher comparability of financial statements along the member states. However, the harmonization of accounting requirements proceeded only moderately and it could not eliminate significant differences between national accounting standards (Henrici, 2004, p. 47).

With a further increase of international interdependence there was a certain evidence for a consistent set of accounting standards. Especially large European companies were seeking capital on international capital markets and are obliged to prepare a second set of accounts for that purpose.[49] The European Commission did not make significant progress with their harmonization efforts and officially announced a change of strategy in November 1995 (European Commission, 1995, p. 2-14). The approach proposes for the first time, that the Union put their weight behind the international standardization process which is already well under way in the International Accounting Standards Committee (IASC). Five years later the

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[47] The trend toward internationalization is not only in the area of financial accounting. The development can also be seen in other laws and regulations, for example corporate governance or the Basle bank regulation.

[48] The council directives were supplemented by additional industry-specific council directives regarding banks and other financial institutions and insurance undertakings (European Commission 1986, 1991).

[49] Most often companies were seeking capital on the New York Stock Exchange and were obliged to present accounts confirming with the US Generally Accepted Accounting Policies.

European Commission announced the specific objective that all publicly traded companies had to prepare consolidated financial statements in an uniform set of international accounting standards as of 2005 (European Commission, 2000, p. 3-10). This requirement became mandatory for all member states in July 2002 (European Commission, 2002, p. L243/1). The decision to apply the accounting requirements as developed by the IASC was a paradigm shift of the EC. Previously, the EC had supported the process to harmonize equivalent accounting systems while for the future an uniform accounting system will be enforced.

The IASC (and its successor body) is a multinational cooperation with the objectives of developing a set of International Accounting Standards and promoting the use of these standards. The International Accounting Standard Committee Foundation (IASC Foundation), the predecessor body of today´s International Financial Reporting Standards Foundation (IFRS Foundation), was already formed in 1973 by professional accounting associations from nine countries – Canada, the United Kingdom, the United States, Australia, France, Germany, Japan, the Netherlands and Mexico. The IFRS Foundation is an independent, not-for-profit private sector organization working in the public interest. The main objective is to narrow the differences in financial statements by seeking to harmonize the international accounting principles (IFRS Foundation, 2011, p. 5). The general approach to the harmonization is focused on financial statements that are prepared for the purpose of providing information that is useful in making economic decisions (IFRS Foundation, 2010a, p. A24)

The International Accounting Standard Board (IASB) acts as the standard-setting body and operates under the oversight of the IFRS Foundation. The IASB develops and approves International Financial Reporting Standards (IFRSs). It was formed in 2001 to replace the International Accounting Standard Committee (IASC)[50]. Each standard issued by the IASC was called International Accounting Standard (IAS). Ever since the IASB replaced the IASC, a newly emerging standard or the replacing of an existing IAS carried out is called IFRS.[51]

The IFRS Foundation is accompanied by the IFRS Foundation Trustees and the IFRS Foundation Monitoring Board (Three tier structure). The IFRS Foundation Trustees exercises

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[50] The IASC was officially replaced by the International Accounting Standards Board (IASB) at April 1, 2001. Since July 1, 2010 the IASB operates under the legal entity of the IFRS Foundation.
[51] The same terminology is applied to the interpretation of standards. The interpretations of IAS are called Standing Interpretations Committee (SIC) while the newly added interpretations of IFRS are called International Financial Reporting Interpretations Committee (IFRIC).

governance responsibilities[52] and currently consists of 22 trustees following a professional background and geographic balance. The IFRS Foundation Monitoring Board enhances public accountability of the IFRS Foundation while not influence the independence of the standard-setting process. The Monitoring Board comprises of public authorities and provides a formal link between authorities and trustees (IFRS Foundation, 2013a, p. 6-10).

Figure 5: Three Tier Structure
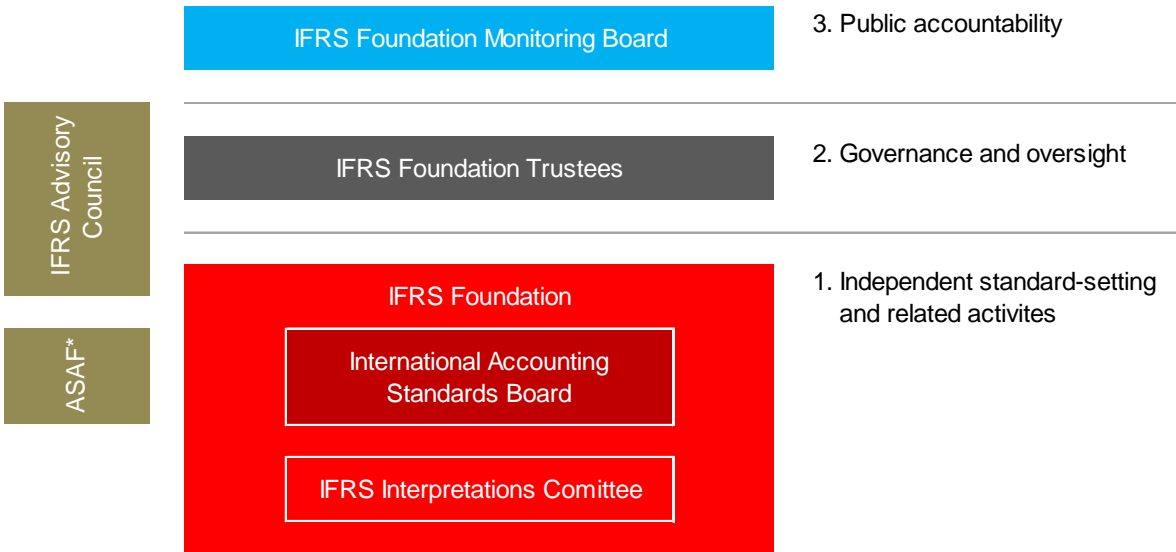
* Accounting Standards Advisory Forum (representatives of international standard-setting community)

Source: IFRS Foundation (2013b, p. 3)

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[52] The Trustees' responsibilities are primarily: (1) appointing members of the IASB, the IFRS Interpretations Committee and the IFRS Advisory Council; (2) establishing and amending the operating procedures, consultative arrangements and due process for the IASB, the Interpretations Committee and the Advisory Council; (3) reviewing annually the strategy of the IASB and assessing its effectiveness; (4) ensure the financing of the IFRS Foundation and approve annually its budget. (IFRS Foundation 2014).

4.4.   Objectives of IFRS Foundation

The IFRS Foundation operates in several accounting related areas. It defines its main objectives as follows (IFRS Foundation, 2010b, p. 5):

(a) to develop, in the public interest, a single set of high quality, understandable, enforceable and globally accepted financial reporting standards based upon clearly articulated principles. These standards should require high quality, transparent and comparable information in financial statements and other financial reporting to help investors, other participants in the world's capital markets and other users of financial information make economic decisions.
(b) to promote the use and rigorous application of those standards.
(c) in fulfilling the objectives associated with (a) and (b), to take account of, as appropriate, the needs of a range of sizes and types of entities in diverse economic settings.
(d) to promote and facilitate adoption of International Financial Reporting Standards (IFRSs), being the standards and interpretations issued by the IASB, through the convergence of national accounting standards and IFRSs.

Inside all IFRSs and Interpretations there will never be a detailed all-embracing concept. Specific issues could be in the nonattendance of a standard or interpretation while other issues require consciously the judgment of an entity in applying certain accounting policies as provided for in IAS 8 "Accounting Policies, Changes in Accounting Estimates and Errors"[53]. The basic concepts that underlie financial statements prepared in conformity with IFRSs are described in the Conceptual Framework for Financial Reporting.

4.5.   Conceptual Framework of the IFRS Foundation

The Conceptual Framework[54] was originally adopted in 1989 by the IASC and later on unmodified adopted by the transition to the IASB. It sets out the basic concepts that underlie the preparation and presentation of financial statements to external users. Beginning with the general objective of financial reporting, to provide useful financial information for economic decisions, it continues with the qualitative characteristics and provides also the basic

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[53] IAS 8.11: In making the judgment described in paragraph 10, management shall refer to, and consider the applicability of, the following sources in descending order:
(a) the requirements in IFRSs dealing with similar and related issues; and
(b) the definitions, recognition criteria and measurement concepts for assets, liabilities, income and expenses in the Conceptual Framework.
[54] At that time it was called Framework for the Preparation and Presentation of Financial Statements.

accounting principles and definitions for key elements of financial statements (IFRS Foundation 2010a, p. A27–A54).

Even if the Conceptual Framework is not a separate standard, it is relevant for the interpretation of existing IFRSs or for previously unregulated issues. On the other hand inconsistencies with individual IFRSs are the most performed criticism. These were reduced over time, but have not been completely eliminated yet (Pellens et al, 2011, p. 117).

4.6.   Provide Useful Financial Information

According to the Conceptual Framework OB12 and IAS 1.15 the general purpose of financial reports is to provide information about the financial position of a reporting entity. Financial statements shall present fairly the financial position, financial performance and cash flows of an entity. Financial reports also provide information about the effects of transactions and other events that change a reporting entity's economic resources and claims. Both types of information provide useful input for decisions about providing resources to an entity.

The provided financial information should be useful for potential and existing investors, other participants in the world's capital markets and other users of financial information who make economic decisions, but the main focus of the IFRS accounting is the information purpose of investors. It implies that financial information needs for investors covers also for the other users (Peemöller 2010, p. 12).

4.7.   Qualitative Characteristics of Useful Financial Information

The Conceptual Framework defines the qualitative characteristics as the type of information that are likely to be most useful to the existing and potential investors, lenders and other creditors for making decisions about the reporting entity on the basis of information in its financial reports. They are split into fundamental qualitative characteristics and enhancing qualitative characteristics. Fundamental qualitative characteristics for useful financial information are the relevance and the faithful representation what it purports to represent. The enhancing qualitative characteristics are described as comparability, verifiability, timeliness and understandability. These supplementary characteristics should enhance the usefulness of financial information and also assist to determine the application whether a phenomenon is considered equally relevant and faithfully represented. The application of qualitative characteristics could be partially counter and so may need to be balanced against one another by professional judgment (Alfredson et al, 2009, p. 15). The only constraint that limits

the information provided by financial reporting are the incurring costs of collecting, processing, verifying and disseminating financial information. These costs should be justified by the benefits of providing that information (IFRS Foundation 2010a, p. A38).

4.8.   International Financial Accounting Standards in Europe

The year 2005 marked the beginning of a new era and the result of over thirty years of effort for establishment of accounting rules for a global capital market by the IFRS Foundation. The European Union (EU) efforts to create a single European financial market had its impact on the Europe-wide accounting regulation. In June 2000 the European Commission officially recommended its member countries to harmonize their national regulation for consolidated financial statements to the IASs/IFRSs (European Commission, 2000, p. 3) and in 2002 the European Parliament adpted the regulation (EC) No 1606/2002 on the compulsory appli-cation of IFRS. This stated that since 2005 the IFRSs have to be applied for companies listed at European securities markets in their consolidated financial statements (European Commission, 2002, p. L243/1). Member states are allowed to extend the application of IFRS companies whose shares are not traded on the stock exchange. Many unlisted companies which are currently not obliged to comply with IFRS are already applying the international standards or have the intention to adopt what apparently will be the new worldwide standard (Peemöller, 2010, p. 3). So far, a voluntary application of IFRS has not been prohibited by any member state.

Since the IFRS Foundation is a private association, a newly issued standard or an amend-ment to an existing IAS/IFRS is not automatically adopted by the legislative body. Generally each IFRS-adopting country has to accept the respective IFRS and must legislate the IFRS to national law. In European countries, the acceptance of an IFRS as a European accounting standard is done by the adoption process[55]. After a new IFRS or an amendment to an IFRS is published by the IASB the European Commission deals with several technical expert groups and commissions[56]. They advise the European Commission in the endorsement of the standard (European Commission, 2002, p. L243/1-L243/4; IAS plus, 2011, p. 1-2). The endorsement mechanism in the EU should ensure that IFRS meet the needs of EU listed companies.

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[55] The adoption process is sometimes referred to as endorsement.
[56] Namely the European Commission deals with the European Financial Advisory Group (EFRAG), the Standard Advice Review Group (SARG) and the Accounting Regulatory Committee (ARC). For a detailed overview see also IAS plus, 2011.

4.9.   Fair Value Accounting

The international developments and the application of the International Financial Accounting Standards brought several innovations to European companies in relation to their former national accounting requirements. An essential innovation was the opportunity to report certain financial instruments at their fair value, which were until then mainly reported on a historical or amortized cost model[57]. The application of the international standards led to a so called 'mixed model' for the assessment of financial instruments. It is a mixed model because it contains both standard elements of accounting: financial instruments measured at amortized cost, as well as financial instruments at fair value. The assessment is based according to categories of balance sheet items (for more details please see chapter 5 Accounting for Financial Instruments).

The accounting of financial instruments at fair value came under criticism in recent years, particularly during and after times of the financial market crisis. Parts of the practical users, academics, and politics have called for substantial rule changes. They argue that fair value accounting creates an "artificial" volatility in financial markets and lead to downward spiral of falling prices. Furthermore, the fair value accounting has the potential of exacerbating contagion among banks (Kaufman & Scott, 2000, p. 4-14; European Central Bank, 2004, p. 6-13; Penman, 2007, p. 33-44; Johnson, 2008; Sanio, 2008; Laux & Leuz, 2009, p. 8-19; Khan, 2011, p. 1-6).

However, a simple return to historical/ amortized cost accounting does not appear appropriate. It is has to be considered that the use of financial instruments has largely increased in recent years and the presentation of financial transactions can be rather complex. Financial instruments were in previous years almost exclusively used on liquidity management; while nowadays they meet a variety of other purposes, for example:

- Larger enterprises increasingly avail international financial markets to refinance themselves,
- derivatives became increasingly being used, to hedge risk and also for speculative purposes,

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[57] Under the historical cost model, assets and liabilities are recorded at their nominal or original monetary value, which usually represents the value when first acquired. In general, these assets and liabilities are not restated for changes in value. Under the amortized cost model, assets and liabilities are recorded at their nominal or original monetary value, but are normally depreciated over their estimated lifetime.

- assets and liabilities are temporary sold to a third party or securitized in the capital market,
- an entities liquid assets are distributed to several investments under consideration of profitability and control of the overall risk profile of the entity.

Besides are certain financial instruments subject to temporal value fluctuations that require a separate accounting treatment to reflect the risk and rewards of the financial instrument more precisely (Pellens et al, 2011, p. 547).

4.9.1. Pros and Cons of Fair Value Accounting

The fair value is one way to measure financial instruments that appear in an entities statement of financial position. Proponents of fair value accounting argue that financial instruments presented at fair value reflect current market conditions and thereby increase transparency, encourage prompt corrective actions, support investors in the understanding of their risk profile, and are more relevant than historical and amortized cost accounting. But there are also some concerns and issues associated with the fair value measurement of financial instruments. The main concerns are that fair value is not relevant and potentially misleading for financial instruments held for a longer period, especially till maturity; current market prices could be distorted by market inefficiencies, investor irrationality or liquidity problems; fair values derived from valuation models are not reliable; and that fair value accounting contributes procyclicality to the financial system (for example: Barth, 2004, p. 324-327; European Central Bank, 2004, p. 6-13; Penman, 2007, p. 33-44; Benston, 2008, p. 101-104; Allen & Carletti, 2008a, p. 358-378).

4.9.2. Legal Environment of Fair Value Accounting within the EU

The decision of the EC to apply the accounting requirements as developed by the IASC brought far-reaching consequences to the EC accounting directives at that time (see chapter 4.3 Evolution of International Accounting Standards: IFRS Foundation, and International Accounting Standards Board). In order to maintain a consistency between international financial accounting standards as published by the IFRS Foundation and the accounting directives as published by the EC, it was necessary to amend the EC directives in order to allow for certain financial assets and liabilities to be valued at fair value and to eliminate other inconsistencies. For that reason, the EC published the fair value directive (European Commission, 2001, p. L283/28-L283/32) and the modernization directive (European Commission, 2003, p. L178/16-L178/22). In particular, the fair value directive established the

coherence between the EC accounting directives and the provisions of IAS 39 *Financial Instruments: Recognition and Measurement.*

The EC justified the need for the fair value directive with the dynamic nature of international financial markets that has resulted in the widespread use of not only traditional primary financial instruments such as shares and bonds, but also various forms of derivative financial instruments such as futures, options, forward contracts and swaps. Comparable financial information throughout the community can only be provided with the requirement of fair value accounting for certain financial instruments. Furthermore, the development is in line with the global community as leading accounting standard setters in the world are moving away from the historical and amortized cost model for the valuation of these financial instruments towards a model of fair value accounting (European Commission, 2011, p. 6-7, 11).

4.9.3. Evolution of a Full Fair Value Accounting Model

For many years, the IASB had the objective to require that entities shall measure all financial instruments at fair value with realized and unrealized gains and losses recognized in the respective period in which they occur (IASC, 1997, p. 1-194). However, the IASC recognized that there were significant impediments from technical and practical side that take more time to resolve. Therefore the IASC published an interim international standard IAS 39 on recognition and measurement of financial instruments in 1998.

To solve the impediments, the IASC joined the Joint Working Group of standard setters (JWG). The JWG comprises representatives from the IASC, the US FASB and eight other international bodies and was established to develop an integrated and harmonized standard on financial instruments and similar items. In December 2000 the JWG published a draft standard, which built on the theoretical approach of the IASC Discussion paper from 1997. It uses the fair value as the most useful measure of financial instruments. Subsequent all financial instruments, with only minor exceptions, would be recognized at fair value with corresponding gains and losses reported in profit or loss (Joint Working Group of Standard Setters, 2000, p. 150).

Among the major standard setters and their JWG representatives was a high degree of consensus that measuring all financial instruments at fair value is the ultimate solution. Until the beginning of the financial market crisis, the IASB continued to move towards their long-term objective of measuring all financial instruments at fair value with realized and unrealized gains and losses recognized in the period in which they occur (for example: IASB 2005,

p. 5-6; IASB 2006, p. 2-3, IASB 2008a, p. 43-65; IASB 2008e, p. 1.3). Also in other standards than those dealing with accounting requirements of financial instruments was an increasing trend towards a full fair value measurement noted, while for others seems a full fair value model impossible (Pellens et al, 2011, p. 553). However, the latest requirements and proposals of the IASB regarding this topic have been developed under significant political pressure and envisage retaining a mixed model with measurements at amortized cost and at fair value as currently used under IAS 39, but one that is rather simpler (Ernst & Young, 2012, p. 2847). The resulting mixed model may not be theoretically convincing, but is at least as a result of decades of discussion and has therefore a certain degree of stability (Pellens et al, 2011, p. 553).

5. Accounting for Financial Instruments

"If you understand IAS 39,
you haven´t read it properly."
Sir David Tweedie
(Chairman of the IASB from 2001 until June 2011;
* 7 September 1944 -)

5.1. Introduction to Financial Instruments

The accounting for financial instruments is rather complex. The basic idea, an illustration of a true and fair view of a company's value, is a desirable approach. But with an increase of complex financial instruments and the desire of a presentation as effective as possible, become the accounting rules also more complex. The accounting rules for financial instruments under International Financial Accounting Standards and their respective measurement requirements are one of the main constitutes and as well one of the most discussed sections of the IFRS.

In the previous chapter were discussed the necessity of financial accounting, the developments and trends in international accounting, and the general characteristics regarding fair value accounting presented. In the following section, the accounting rules regarding accounting of financial instruments are discussed in more detail. In the first section, financial instruments are defined between primary financial instruments and derivative financial instruments. The following is an overview of the development of the relevant standards and the definition of the IASBs view of financial assets, financial liabilities, and equity instruments as well as derivatives and embedded derivatives. Moreover, the classification scheme of the applicable standard IAS 39 "*Financial Instruments: Recognition and Measurement*" is presented. According to these principles, the rules of IAS 39 regarding recognition, subsequent measurement, and derecognition are discussed.

Subsequent the rules for hedge accounting under IAS 39 will be introduced. Hedge accounting is defined as the (at least net effect on income) accounting for offsetting changes

in value of the hedged item and the hedging instrument. The hedging instrument is typically a derivative financial instrument used for hedging purposes. In conclusion of this chapter, the rules of presentation and disclosure of financial instruments are discussed.

5.2.   Financial Instruments

The term "Financial Instrument" includes a wide range of different financial structures. In this context, the literature distinguishes between two basic types of financial instruments: primary financial instruments and derivative financial instruments.

5.2.1.   Primary Financial Instruments

A primary financial instrument means a financial investment whose value is based directly on its market value. The value is not derived from another instrument. Examples of primary financial instruments are stocks, participation rights, bonds, receivables, payables, certificates of deposit, bills and anything else that has its own value.

5.2.2.   Derivative Financial Instruments

Non-primary financial instruments are called derivate financial instruments or just derivatives. The main characteristic is that the value of a derivate financial instrument is linked to some other financial instrument, called underlying. The value of the derivative varies in relation to the underlying. The value is entirely derived from the underlying asset and as the value of the derivative is based on the value of the underlying it is not a primary instrument. In general the underlying has a financial character and represents e.g. an index, interest rate or exchange rate (Stauber 2009, p. 57). All derivatives are contracts where the conclusion and the fulfillment fall apart. Derivatives include e.g. option contracts, interest rate caps, interest rate floors, fixed-rate loan agreements, forward contracts, interest rate collars, futures, swaps, mortgage-backed securities, indexed debt and other types that are direct integrated in assets and liabilities (embedded derivatives), generally linked for the purpose of contract fulfillment to the value of a real or financial asset or to an index of securities. They are either standardized contracts traded on organized futures exchanges or over the counter.[58]

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[58] Further recommendable reading on the subject of derivatives offer Hull (2011) or Chance & Brooks (2010).

The number and diversity of financial instruments has grown exponentially in recent years (Beine & Meyer 2010, p. 228). Because of the complexity and the constant innovation of derivatives, an all-encompassing definition of derivatives is not found in the literature. In many cases derivative financial instruments are derived from primary financial instruments, while the recombination of derivative instruments to new innovative products increased lately.

The usage of derivatives can be done from a backup, speculative or trading perspective. In particular, the hedging of risky positions in the operational and financial sector has a great importance for private companies. They use derivatives to minimize or prevent against an unfavorable development. Since the holder of a financial derivative does not directly hold the underlying, it enables him to participate with relatively little investment in the performance of the underlying (Pellens et al, 2011, p. 557).

The following overview shows the separation between three types of derivative financial instruments. The split is also used for the classification of financial instruments into the respective IFRS categories.

Figure 6: Derivative Financial Instruments
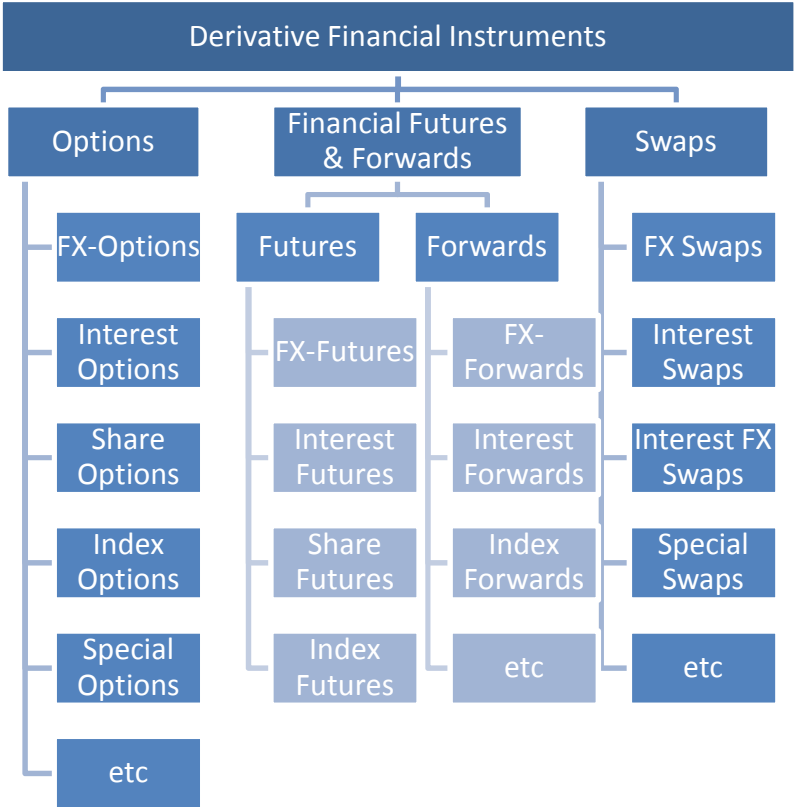
Source: compiled by the author

5.3. Overview and Development of Relevant Standards

The following section provides an overview of the relevant IFRS standards for financial instruments and allows insights into the historical development. In addition, an outlook is given regarding the proposed replacement of the current standard.

5.3.1. Development of Relevant Standards

The accounting for financial instruments is governed in IAS 32 *Financial Instruments: Presentation*, IAS 39 *Financial Instruments: Recognition and Measurement* and respectively in IFRS 9 *Financial Instruments;* IFRS 7 *Financial Instruments: Disclosures* puts all of the financial instruments disclosures together. Since the 1980s the IASC is engaged to regulate the accounting for financial instruments. In the first instance IAS 25 *Accounting for Investments* was adopted in 1985. The standard applies in principle the definition and classification of financial investments. It was later replaced by IAS 39. In 1995 IAS 32 was published and henceforth established principles in presenting and disclosing information of financial instruments. In 2005 it was revised and the disclosures initially stipulated in IAS 32 have been moved to IFRS 7.

Figure 7: Overview of the Essential Requirements for Financial Instruments under IFRS
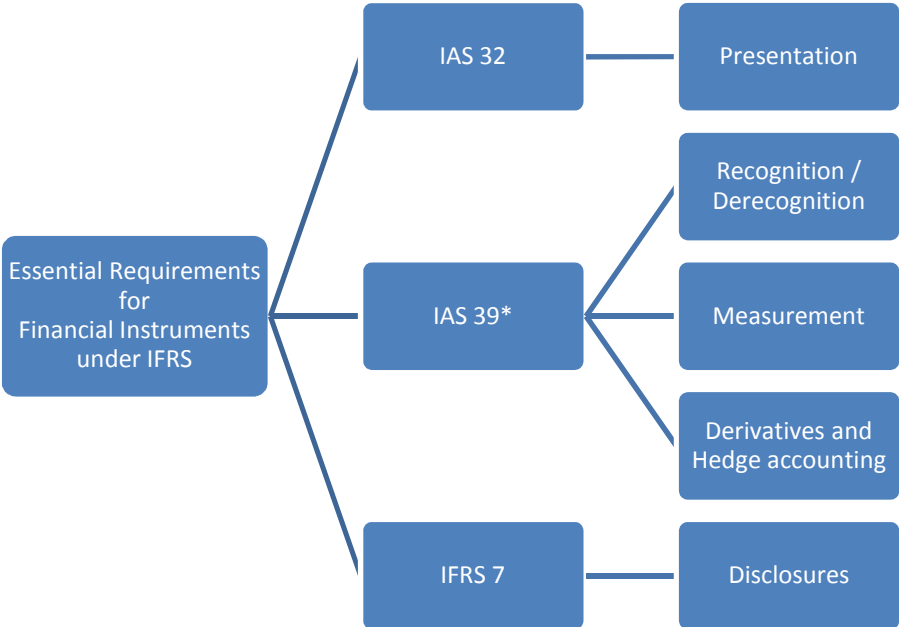
*IAS 39 is expected to be replaced by IFRS 9; current version of IFRS 9 does not include a mandatory effective date but is available for adoption

Source: compiled by the author

In 1998, the first edition of IAS 39 was published, which has been revised in the meantime. IAS 39 applies the recognition and measurement of financial instruments. Furthermore it regulates hedge accounting. Already in the adoption of IAS 39, the former IASC described the standard only as an interim solution, because the proposed solution of the full assessment of all financial instruments at fair value could not be enforced. Also the proposal to account financial instruments in accordance with U.S. GAAP (in particular SFAS 115, 133 and 140) was unable to adopt. A final solution should be found in consensus with the Joint Working Group of Standard Setters of Financial Instruments (JWG) (Joint Working Group of Standard Setters 2000, p. 3-5).[59] Prior to the financial market crisis, it was commonly agreed that fair value accounting will become the main criteria to measure financial instruments. However, there were some concerns raised regarding the fair value accounting (e.g. ECB 2004, p. 6-13), but in general it was believed that the benefits dominate and the fair value approach will improve transparency, supported investors in the understanding of their risk profile and is more relevant than historical and amortized cost accounting (IASC, 1997; Hitz, 2007, p. 323–362; Allen & Carletti 2008a, p. 358-378). Accordingly the objectives of the JWG went in the same direction and were essentially a full fair value accounting approach (Niemeyer 2003, p. 10-12). The developed proposals of the working group have not lead to a complete revision of IAS 39 so far.

In March 2008, the IASB has published a discussion paper with the aim of a reduction of complexity in reporting financial instruments (IASB 2008a, p. 14-66). The project was a joint project with the US-American standard-setter FASB. Thus the FASB published in March 2008 the adopted discussion paper for comment by its constituents (FASB 2008). The paper was designed to gather information to assist the boards in developing new standards that are principle-based and less complex than the requirements at that time. It proposed a single method for measuring financial instruments while fair value measurement seemed to be the preferred method. The paper discussed an intermediate and a long-term approach. The intermediate objectives can be separated into three basic approaches:

(a)   to amend measurement requirements,

(b)   to replace the existing requirements with a fair value measurement principle and some optional exceptions to fair value measurement; and/or

(c)   to simplify hedge accounting.

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[59] After the IAS 39 was published, the IASC and the other standard setters participated in a „Joint Working Group of Standard Setters on Financial Instruments". The working group analyzed the possibilities of a full fair value measurement of nearly all financial instruments for companies in all industries and size classes.

The long-term approach had the effort to measure all types of financial instruments in the same way, by using the fair value as only measurement attribute (IASB 2008a, p. 43-66).

In general the full fair value accounting approach has always been a controversial one that was met with considerable resistance - and the beginning of the financial market crisis has encouraged the opposition in their view. Consequently, the IASB's proposal towards a full fair value accounting has decreased significantly (Ernst & Young 2012, p. 2847).

All of the efforts have had a very long-term implementation period. Before the IASB could pursue further discussion on this project, the effects of the financial crisis[60] had led to changes in IAS 39. Finally the long-term project of reducing complexity in reporting financial instruments was fully replaced by the project of the *Replacement of IAS 39,* which is partly based on the proposals of the discussion paper.

As a quick response to the financial crisis – also under pressure of the European Union - some short-term changes in IAS 39 have taken place. IAS 39 was amended to provide that the restrictions were relaxed for reclassification of financial instruments. In October 2008 the *Amendment to IAS 39 for reclassification of financial assets* was published by the IASB and almost at the same time endorsed by the EU[61]. The amendments were retrospective effective at the 01. July 2008. The changes to IAS 39 permit for the first time a reclassification of financial instruments from fair value categories to categories measured at cost or amortized cost. The amendment was implemented in order to prevent entities against further asset write-offs.[62]

The disclosures about financial instruments in IFRS 7 should be improved, resulting in an additional exposure draft in December 2008 (IASB 2008c). This draft had mainly to cope with fair value measurements and amplify existing principles for liquidity risk disclosures (IASB 2009a). In particular, the fair-value hierarchy has been adopted from the corresponding U.S. standard setter (SFAS 157.22-31). The fair value hierarchy should reflect the level of judgment involved in estimating fair values. It also includes the exposure draft additional amendments for disclosures about liquidity risk associated with financial instruments. Finally the

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[60] For detailed overview of the financial crisis see also chapter 3.
[61] The exposure draft „Amendments to IAS 39 and IFRS 7: Reclassification of Financial Instruments" was published by the IASB at 13 October 2008 and the endorsement by the EU was at 15 October 2008. In general the endorsement process takes a significant longer period. The amendment was introduced in very short notice and without the regular process of consideration. This shows also the political urgency and the pressure the European Union put on the standard setter. See also IASB (2008b), EFRAG (2011) and Fiechter (2009).
[62] For a detailed description see also chapter 5.6.6.

amendments were adopted in March 2009 and became effective for annual periods beginning on or after January 1, 2009 (EFRAG 2011).

In December 2008 another exposure draft was published regarding embedded derivatives on reclassifications of financial assets. The amendments clarify the requirements in IAS 39 *Financial Instruments: Recognition and Measurement* and IFRIC 9 *Reassessment of Embedded Derivatives*. In March 2009 the amendments were issued by the IASB and have been applicable since July 2009 (IASB 2008d, EFRAG 2011).

In April 2009 the IASB had published the exposure draft *Derecognition* to replace the existing derecognition model in IAS 39 and the associated disclosure requirements in IFRS 7. In response to the feedback received, the IASB decided to retain existing derecognition require-ments (IAS 39) and to finalize improved disclosure requirements (IFRS 7). It is planned to replace the existing derecognition model in the course of the replacement by IFRS 9. The issued requirements regarding IFRS 7 are included in the amendments *Disclosures—Transfers of Financial Assets* (IASB 2010a). They have been issued by the IASB in October 2010 and became effective for periods beginning on or after July 2011.

All of the above mentioned amendments were issued as part of the IASB's response to the global financial crisis. An overview of the various exposure drafts that have been converted into valid law is given in Table 1.

Table 1: EU-enforced Exposure Drafts as part of the IASB´s Response to the Global Financial Crisis.

Enforced exposure drafts (since October 2008)	Concerning Standard	Essential content	Endorsed by the EU
October 2008 Reclassification of Financial Assets	IAS 39 / IFRS 7	Extension of reclassification options	Oct 2008
December 2008/ March 2009 Improving Financial Instrument Disclosures	IFRS 7	Enhancing disclosures about fair value and liquidity risk	Nov 2009
December 2008 Embedded Derivatives	IAS 39 (IFRIC 9)	Embedded derivatives on reclassifications of financial assets	Nov 2009
April 2009/ reissued in October 2010 Derecognition	IFRS 7 (IAS 39)	Enhanced derecognition disclosure requirements for transfer transactions of financial assets	Nov 2011

Source: EFRAG; www.efrag.org/Front/pl0-272/all.aspx, retrieved: 24 August 2012

5.3.2. Project Replacement of IAS 39

The IASB is in the process of replacing the current IAS 39. The project is split into several phases. IFRS 9 *Financial Instruments* shall primarily replace the accounting requirements relating to classification and measuring of financial assets and financial liabilities. Furthermore, the IASB has published IFRS 13 dealing with the measurement of fair values. The guidance on fair value measurement is currently spread over various IFRSs. IFRS 13 is effective for annual periods on or after 1 January 2013. IFRS 9 was originally intended to apply at the same date. However, the endorsement process of IFRS 9 was postponed till the IFRS 9 project is closer to completion. IFRS users shall have sufficient time to prepare to apply the new standard (IASB, 2013c). Early application is permitted. The empirical part of this analysis is done retrospectively; so the reporting requirements are derived from IAS 39. Nevertheless, the forthcoming requirements related to this topic are shown for a better understanding and observation of the development.

In November 2008, the IASB added the project of replacing the existing IAS 39 by the newly issued IFRS 9 *Financial Instruments* to their active agenda. The objective of the replacement is to improve the usefulness of financial statements for users by simplifying the classification and measurement requirements for financial instruments (IASB 2008a). The IASB was generally interested in replacing the existing "interim solution" of IAS 39, but in this case the motivation came also from the political side. The G20 called upon the standard setters[63] to review and align global accounting standards and to reduce the complexity of accounting for financial instruments. The existing practices were considered too nontransparent (G20, 2009). In response, the IASB had decided to no longer make temporary changes to IAS 39. Instead, the accounting for financial instruments should be fully replaced by the new project (IASB, 2009b). The project plan for the replacement of IAS 39 consists of three main phases, determined by the IASB:

Phase 1: Classification and Measurement
Phase 2: Impairment
Phase 3: Hedge Accounting

In November 2009 the IASB launched the first phase of IFRS 9: Classification and Measurement. The requirements will supersede the provisions of IFRS 39 regarding classification and measuring of financial assets (IFRS 9.IN5). In October 2010 the IASB continued the first phase of IFRS 9 by publishing requirements dealing with the classification and measurement of financial liabilities, the derecognition of financial assets and financial liabilities and how to measure fair value (IFRS 9.IN6, IN7). Most of these requirements are similar or unchanged IAS 39 requirements and have been carried forward without substantive amendment.

IFRS 9 uses a mixed attribute model, as in the previous IAS 39. But there are only two primary measurement categories for financial assets: amortized cost and fair value. The four categories and the tainting provisions of IAS 39 are eliminated. IFRS 9 classification requirements for financial liabilities are similar to those in IAS 39.

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[63] The project became a joint project by the IASB and the FASB. The FASB also added the project "Accounting to financial instruments" to their agenda in December 2008 (FASB 2011).

The first phase of IFRS 9 contained requirements for the classification and measurement of financial instruments. It was initially published in November 2009 and contained requirements for financial assets (IASB, 2009c). Subsequent, requirements for financially liabilities were added in October 2010 (IASB, 2010b). Financial assets shall be classified according to two categories: those measured at amortized cost and those at fair value. The requirements for financial liabilities were carried forward mainly unchanged[64] from IAS 39, containing two measurements categories: those at amortized cost and those at fair value. The first phase is almost completed. It was subject to limited modifications in November 2012 (IASB, 2012) and is currently in jointly discussions between the IASB and the FASB about the feedback received on these proposals.

The objective of the second phase is to improve the amortized cost measurement, in particular provisioning for losses on loans and the credit quality of financial assets. It is not yet finalized. The current IAS 39 stipulates an incurred loss model. Only after a loss event has occurred, an entity can made a provision. During the financial crisis, the incurred loss model was criticized for delaying the recognition of losses and for not reflecting the economic conditions promptly, mainly the credit losses that were expected to occur.

The current development stipulates that the former impairment trigger is abolished and will be replaced by a more forward looking provisioning model based on expected losses ("expected loss model"). This model is expected to consider credit losses more promptly and that the economic circumstances of credit lending are better reflected. It provides a significantly lower threshold, wherein all expected credit losses shall be recognized at the time the financial instrument is considered in the entities' financial statements and not only when financial instruments are close to default. The amount of the provision depends on the change in credit quality since initial recognition. The exposure draft regarding the expected credit loss model was published in March 2013. Currently, the IASB discusses the feedback received to complete the second phase of the replacement (IASB, 2013a).

The third phase of IFRS 9 is concerned about the hedge accounting requirements. It is not yet finalized. The incentive is to align accounting and risk management activities and to improve the ability of investors to understand risk management activities. IASBs' deliberations were finalized in April 2013. It is expected that the revised hedge accounting

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[64] Except for some minor changes regarding the fair value option for financial liabilities to address the issue of own credit risk.

requirements will be finalized in mid-2013 and will be included in a new draft version of IFRS 9 (IASB, 2013b).

5.4. Financial Instruments under IFRS

Various terminological principles are initially clarified to assess the scope of IAS 32/39 and IFRS 7/9. According to IAS 32.11 a financial instrument is defined as "any contract that gives rise to a financial asset of one entity and a financial liability or equity instrument of another entity". The contract needs not to be written. The criterion of a contract refers to the economic consequences that the parties have, usually enforceable by law (IAS 32.13).

Figure 8: Financial Instruments according to IFRS
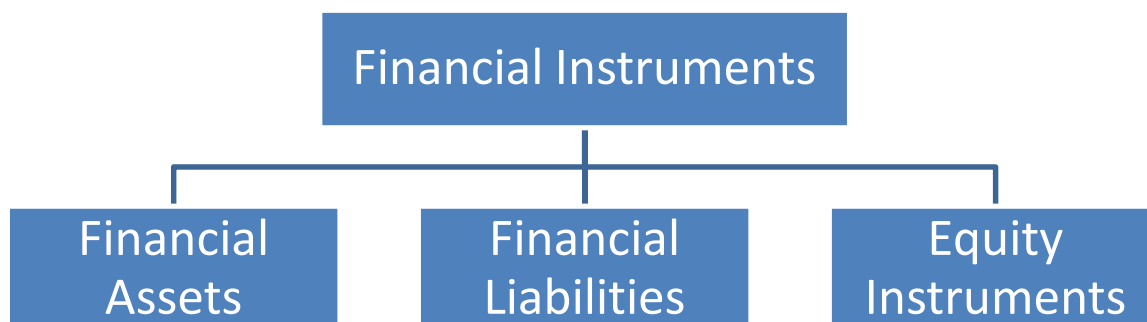
Source: compiled by the author

Financial assets and financial liabilities are terms defined by three standards: IAS 32 *Financial Instruments: Presentation* (Disclosure provisions superseded by IFRS 7 effective 2007), IAS 39 *Financial Instruments: Recognition and Measurement* (Superseded by IFRS 9 *Financial Instruments* effective 2015) and IFRS 7 *Financial Instruments: Disclosures*. Financial assets are defined from the perspective of the holder of the instrument, whereas financial liabilities and equity instruments are defined from the perspective of the issuer of the respective instrument. An equity instrument is defined as any contract that evidences a residual interest in the assets of an entity after deducting all of its liabilities. The requirements related to this topic are mainly derived from IAS 39 Financial Instruments: Recognition and Measurement.

The definition of a financial instrument is constantly two-sided: the contract must rise to a financial asset of one party, with a corresponding financial liability or equity instrument of another party. In total financial instruments are as such a zero sum game.

5.4.1. Financial Assets

Financial assets under IFRS include cash, other cash equivalents or equity instruments held of another entity. Also contractual rights to receive cash or another financial asset from another entity (e.g. bonds held of another entity) and contracts that will or may be settled in the entity's own equity instruments (e.g. stock options) are classified as financial asset. Likewise are contractual rights that are potentially favorable to the entity.

A financial asset is defined in IAS 32.11 as follows:

(a) cash;

(b) an equity instrument of another entity;

(c) a contractual right:

> (i) to receive cash or another financial asset from another entity; or

> (ii) to exchange financial assets or financial liabilities with another entity under conditions that are potentially favourable to the entity; or

(d) a contract that will or may be settled in the entity's own equity instruments and is:

> (i) a non-derivative for which the entity is or may be obliged to receive a variable number of the entity's own equity instruments; or

> (ii) a derivative that will or may be settled other than by the exchange of a fixed amount of cash or another financial asset for a fixed number of the entity's own equity instruments. For this purpose the entity's own equity instruments do not include puttable financial instruments classified as equity instruments in accordance with paragraphs 16A and 16B, instruments that impose on the entity an obligation to deliver to another party a pro rata share of the net assets of the entity only on liquidation and are classified as equity instruments in accordance with paragraphs 16C and 16D, or instruments that are contracts for the future receipt or delivery of the entity's own equity instruments.

5.4.2. Financial Liabilities

A financial liability incurred from an obligation either to deliver cash to an external entity (e.g. a bond issued) or to exchange financial instruments with this party under unfavorable conditions (e.g. written obligation of an option)

A financial liability is defined in paragraph 11 of IAS 32 as follows:

(a) a contractual obligation :

      (i) to deliver cash or another financial asset to another entity; or

      (ii) to exchange financial assets or financial liabilities with another entity under conditions that are potentially unfavourable to the entity; or

(b) a contract that will or may be settled in the entity's own equity instruments and is:

      (i) a non-derivative for which the entity is or may be obliged to deliver a variable number of the entity's own equity instruments; or

      (ii) a derivative that will or may be settled other than by the exchange of a fixed amount of cash or another financial asset for a fixed number of the entity's own equity instruments. For this purpose, rights, options or warrants to acquire a fixed number of the entity's own equity instruments for a fixed amount of any currency are equity instruments if the entity offers the rights, options or warrants pro rata to all of its existing owners of the same class of its own non-derivative equity instruments. Also, for these purposes the entity's own equity instruments do not include puttable financial instruments that are classified as equity instruments in accordance with paragraphs 16A and 16B, instruments that impose on the entity an obligation to deliver to another party a pro rata share of the net assets of the entity only on liquidation and are classified as equity instruments in accordance with paragraphs 16C and 16D, or instruments that are contracts for the future receipt or delivery of the entity's own equity instruments.

5.4.3. Equity Instruments

An equity instrument (e.g. company share) serves as any legally enforceable evidence of the right of participation in the residual value of an entity. The residual value of an entity is defined by the assets after deducting all of its liabilities [IAS 32.11]. This definition contains not only "normal" shares; also e.g. short positions to purchase shares of the reporting entity are included. The determination whether a financial instrument is a financial liability or an equity instrument is defined in IAS 32.IN6.

A financial instrument can only be recognized as equity instrument if both conditions (a) and (b) are met:

(a) The instrument includes no contractual obligation:
  (i) to deliver cash or another financial asset to another entity; or
  (ii) to exchange financial assets or financial liabilities with another entity under conditions that are potentially unfavourable to the issuer.
(b) If the instrument will or may be settled in the issuer's own equity instruments, it is:
  (i) a non-derivative that includes no contractual obligation for the issuer to deliver a variable number of its own equity instruments; or
  (ii) a derivative that will be settled by the issuer exchanging a fixed amount of cash or another financial asset for a fixed number of its own equity instruments. For this purpose, the issuer's own equity instruments do not include instruments that are themselves contracts for the future receipt or delivery of the issuer's own equity instruments.

In summary financial instruments are any forms of contract that leads directly or indirectly to the inflow or outflow of cash or equity securities.[65] The terms of 'contract' and 'contractual' are quite important for the definition and refer to an agreement between two or more parties that has clear economic consequences that the parties have little, if any, discretion to avoid, usually because the agreement is enforceable by law. Contracts, and thus financial instruments, may take a variety of forms and need not be in writing (IAS 32.13). As well as non-derivative financial instruments such as receivables, payables and equity instruments, financial instruments also include derivative financial instruments such as financial options, forwards, futures, interest rate and currency swaps.

5.5.   Derivatives and Embedded Derivatives under IFRS

A derivate is a financial instrument or other contract within the scope of IAS 39. It could be distinguished between derivatives in a general sense and embedded derivatives that are part of a hybrid contract or combined instrument.

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[65] The application guidance of IAS 32 – Financial Instruments: Presentations gives simple examples of financial assets, financial liabilities and equity instruments.

5.5.1. Derivatives

Central characteristic of derivative financial instruments is that their performance depends on a so-called base object or underlying. All derivatives simply derive their value from another underlying item. A derivative will always have at least one or more underlying items, for example, specified interest rate, financial instrument price, commodity price or foreign exchange rate (IAS 39.9, IFRS 9 Appendix A). The holder of a financial derivative has no need of holding the underlying itself. Derivative financial instruments create rights and obligations to transfer one or more financial risks inherent in an underlying between the contracting parties without any need to transfer the underlying instrument themselves (IAS 32.AG15, AG16).

A derivative financial instrument gives a contractual right to exchange financial assets of financial liabilities with another party under potentially favorable conditions (recognized as financial asset), while the other party has a contractual obligation to exchange under potentially unfavorable conditions (recognized as a financial liability) (IAS 32.AG16).

A derivative within the scope of IAS 39 (IFRS 9) has to fulfill all three of the following characteristics (IAS 32.12, IAS 39.9, IFRS 9. Appendix A):

(a) Its value changes in response to the change in a specified interest rate, financial instrument price, commodity price, foreign exchange rate, index of prices or rates, credit rating or credit index, or other variable, provided in the case of a non-financial variable that the variable is not specific to a party to the contract (sometimes called the 'underlying').

(b) It requires no initial net investment or an initial net investment that is smaller than would be required for other types of contracts that would be expected to have a similar response to changes in market factors.

(c) It is settled at a future date.

The following table provides an overview of type of contracts and their main-pricing settlement underlying variable, but this is not an exhaustive list:

Table 2: Financial Derivatives and Underlying Variables

Type of contract	Main pricing-settlement underlying variable
Interest rate swap	Interest rates
Currency swap	Currency rates
Commodity swap	Commodity prices
Equity swap	Equity prices (equity of another entity)
Credit swap	Credit ratings, credit index, or credit price
Total return swap	Total fair value of the reference asset and interest rates
Purchased or written bond option (call or put)	Interest rates
Purchased or written currency option (call or put)	Currency rates
Purchased or written commodity option (call or put)	Commodity prices
Purchased or written stock option (call or put)	Equity prices (equity of another entitiy)
Interest rates futures linked to government debt (treasury futures)	Interest rates
Currency futures	Currency rates
Commodity futures	Commodity prices
Interest rates forwards linked to government debt (treasury forward)	Interest rates
Currency forward	Currency rates
Commodity forward	Commodity prices
Equity forward	Equity prices (equity of another entity)

Source: Ernst & Young, 2012, p. 2904

5.5.2. Embedded Derivatives

An embedded derivative is a component of a hybrid contract or combined instrument that also includes a non-derivative host with the effect that some of the cash flows of the combined instrument vary in a similar way to a stand-alone derivative. When a contract contains an embedded derivative, some or all of the cash flows that otherwise would be required by the contract to be modified according to a specified interest rate, financial instrument price, commodity price, foreign exchange rate, index of prices or rates, credit rating or credit index, or other variable, provided in the case of a non-financial variable that the variable is not specific to a party to the contract (IAS 39.10, IFRS 9.4.3.1).

In principle, an embedded derivate is not separated from the host contract. An entity shall apply the IFRS 9 requirements to the entire hybrid contract (IFRS 9.4.3.2). However, an attached derivative to a financial instrument that is contractually transferable, independently of that instrument, or has a different counterparty, is not an embedded derivative, but a separate financial instrument (IAS 39.10, IFRS 9.4.3.1).

An embedded derivative shall only be separated from the host contract and accounted for as a stand-alone derivative if, the following conditions are commonly met:

(d) the economic characteristics and risks of the embedded derivative are not closely related to those of the host contract;

(e) a separate instrument with the same terms as the embedded derivate would meet the definition of a derivative; and

(f) the hybrid instrument is not measured at fair value with changes in fair value recognized in profit or loss (IAS 39.11, IFRS 9.4.3.3).[66]

If any of these conditions are not met, the embedded derivative should not be separated. (IAS 39.11, AG33, IFRS 9.4.3.3, IFRS 9.B4.3.8)

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[66] The conditions under IFRS 9 are slightly adjusted for clarification:
(a) the economic characteristics and risks of the embedded derivative are not closely related to the economic characteristics and risks of the host (see paragraphs B4.3.5 and B4.3.8);
(b) a separate instrument with the same terms as the embedded derivative would meet the definition of a derivative; and
(c) the hybrid contract is not measured at fair value with changes in fair value recognized in profit or loss (ie a derivative that is embedded in a financial liability at fair value through profit or loss is not separated).

5.6. Classification of Financial Instruments

The most important issue of accounting for financial instruments is the classification of financial instruments (and their components). The accounting treatment can depend partly or fully on the following factors (Ernst & Young, 2012, p. 3037):

- Purpose for which the financial instrument is held
- Contractual characteristics
- Listed or non-listed instrument
- Industry or type of operations of the reporting entity
- Accounting policy choice of the reporting entity.

The accounting treatment for each particular financial asset within the scope of IAS 39 depends on its classification which is determined by using the above mentioned factors. The basic idea of IFRS accounting for financial instruments was to create a full fair value accounting model. After initial recognition, all financial assets and financial liabilities should be stated at fair value in the balance sheet (IASC 1997, Chapter 4, para. 2.1 and Chapter 5, para 3.1). All movements in fair value should be reported in profit and loss (IASC 1997, Chapter 6, para. 5.1). At the time of developing the standard, there were a lot of concerns from the users regarding the recognition and measurement at fair value for all financial instruments. Their doubt was that a full fair value model could have significant influence on the respective internal profit of the period and the balance sheet items due to external fluctuations in the capital markets (Pellens et al, 2011, p. 547). However, the IASC recognized that a short-term completion of the standard was not possible. As a result, a compromise was found with a mixed model. The IASC published an interim international standard on recognition and measurement in 1998. IAS 39 distinguishes the subsequent measurement of financial instruments between various categories (IAS 39.45).

The standard differentiates financial instruments between financial assets and financial liabilities. There are four types of financial assets and two types of financial liabilities defined by IAS 39.

At initial recognition, a financial asset is classified into one of the following four types of categories as defined by IAS 39:

(a) Financial assets at fair value through profit and loss;

(b) Held-to-maturity investments;

(c) Loans and receivables; and

(d) Available-for-sale financial assets (IAS 39.45).[67]

Financial liabilities have to be classified into:

(a) Financial liabilities at fair value through profit and loss; and

(b) Other financial liabilities (IAS 39.47).[68]

The different measurement categories under IAS 39 are presented in the following overview:

Figure 9: Classification of Financial Assets and Financial Liabilities under IAS 39
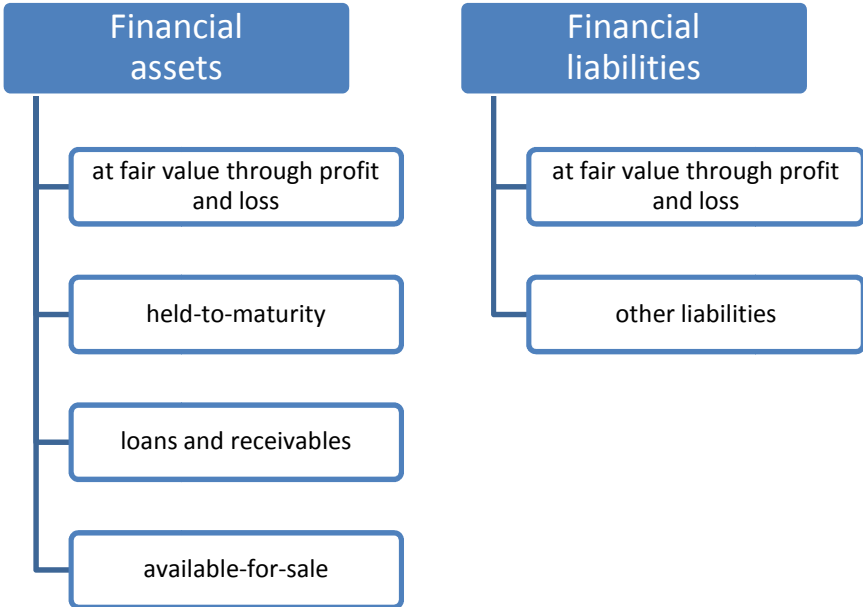
Source: compiled by the author

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[67] Under IFRS 9 the here presented classification is superseded and will be replaced by three measuring categories: financial assets measured at fair value through profit and loss; investments in equity instruments designated at fair value through other comprehensive income; and financial assets measured at amortized cost. IFRS 9 takes also the business model of the entity and the contractual cash flow characteristics into consideration (IFRS 9.4.1).

[68] Under IFRS 9 the classification of financial liabilities distinguish between measured at fair value through profit or loss or at amortized cost (IFRS 9.4.2.1).

Each respective category applies to divergent subsequent measurement and profit and loss recognition. The classification rules for each category are covered in more detail below:

5.6.1. Financial Assets and Liabilities at Fair Value through Profit and Loss

This category includes financial instruments that are either held for trading, or are designated as at fair value through profit or loss such on initial recognition. The designation to place on initial recognition of the respective instrument and is irrevocable until it is derecognized. All instruments in this category are recorded in the balance sheet at fair value and any changes in value are directly reported in the profit and loss.[69]

5.6.1.1. Financial Assets and Liabilities Held for Trading

Held for trading assets and liabilities at fair value through profit and loss have to meet the following conditions:

- Acquired or incurred principally for the purpose of selling or repurchasing it in the near term[70];
- Part of a portfolio of identified financial instruments that are managed together and for which there is evidence of a recent actual pattern of short-term profit taking; or
- A derivative (except for a derivative that is a financial guarantee contract or a designated and effective hedging instrument) (IAS 39.9)

IAS 39.AG14 states that trading generally reflects active and frequent buying and selling, and financial instruments held for trading generally are used with the objective of generating a profit from short-term fluctuations in price or dealer's margin.[71]

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[69] As an exemption, equity instruments (equity or equity derivatives), could be measured at cost in the rare circumstances that the fair value is not reliably measureable. Fair value gains and losses are not recognized in this particular case.

[70] The term "near term" is not explicitly defined by IAS 39. KPMG (2011) suggested that an entity should adopt an own definition and apply a consistent approach to the definition used. The intention of generating a profit from short-term fluctuations should be the determining criteria (KPMG 2011, p. 1338).

[71] The definition is not exhaustive as, for example, many derivatives are held for risk management purposes. Unless the entity is not successfully applying hedge accounting, they are included in this category.

In addition, financial liabilities held for trading include:

- Derivative liabilities (negative fair value) that are not accounted for as hedging instruments;
- Obligations to deliver financial assets borrowed by a short seller (i.e. an entity that sells financial assets it has borrowed and does not yet own);
- Financial liabilities that are incurred with an intention to repurchase them in the near term, such as quoted debt instrument that the issuer may buy back in the near term depending on changes in its fair value; and
- Financial liabilities that are part of a portfolio[72] of identified financial instruments that are managed together and for which there is evidence of a recent pattern of short-term profit-taking (IAS 39.AG15).

The standard intentionally mentioned that a liability which is used to fund trading activities does not in itself make that liability one that is held for trading (IAS 39.AG15).

5.6.1.2. Financial Assets and Liabilities Designated at Fair Value through Profit or Loss

Besides the financial assets and liabilities held for trading, this category comprises of financial instruments that are designated at fair value through profit and loss. This subcategory is also well-known as the `fair value option´ (IAS 39.BC71). The intention is to eliminate or at least significantly reduce accounting anomalies that result from its mixed model approach. Therefore a financial instrument can only be designated at fair value through profit or loss because:

- It eliminates the burden of separating embedded derivatives (IAS 39.9, 11A, BC75);
- It eliminates or significantly reduces a measurement or recognition inconsistency that would arise from measuring assets or liabilities or recognizing the gains and losses on them on different bases; or
- A group of financial assets, financial liabilities or both is managed and its performance is evaluated on a fair value basis, in accordance with a documented risk management or investment strategy, and information about the group is provided internally on that basis to the entity's key management personnel (IAS 39.9, BC74)

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[72] The term „portfolio" is not explicitly defined by IAS 39. Ernst & Young (2012) suggested that a portfolio is a group of financial assets or liabilities that are managed as a part of that group (Ernst & Young 2012, p. 3039).

The intention is to eliminate volatility in profit or loss and equity that would result if matched positions of assets and liabilities are not measured consistently. In addition it de-emphasis interpretative issues around what constitutes trading (IAS 39.BC74A).[73]

5.6.2. Held-to-Maturity Investments

Held-to-maturity investments are non-derivative financial assets with fixed or determinable payments and fixed maturity that an entity has the positive intention and ability to hold to maturity, other than:

- Those that the entity on initial recognition designates as at fair value through profit or loss;
- Those that the entity designates as available-for-sale; and
- Those that meet the definition of loans and receivables (IAS 39.9).

The category held-to-maturity can only be used in limited circumstances and its use is restricted by a number of detailed conditions[74]. Therefore it is treated like an exception (IAS 39.AG20).

By some means investments in held-to-maturity are not designated in this category, they must be designated in this category if they meet the respective conditions. As it is relatively easy for an entity to offend against the detailed conditions, in practice it becomes an exclusively voluntary classification (Ernst & Young, 2012, p. 3046).

The effect of using the held-to-maturity category is that the investments will be measured at amortized cost. Investments should have a contractual agreement that defines a fixed maturity and fixed or determinable payments. For that reason mainly debt contracts are classified as held-to-maturity investments because of the existing determination of maturity and interest and principal payments (KPMG, 2011, p. 1343). On the other hand, the premature sale of held-to-maturity investments is "punished" with the restriction not to use

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[73] Further readings regarding derecognition as at fair value through profit or loss eliminates or significantly reduces a measurement or recognition inconsistency, a group of financial assets, financial liabilities or both is managed and its performance is evaluated on a fair value basis, in accordance with a documented risk management or investment strategy and regarding instruments that contain an embedded derivative that meets particular conditions can be found, for example, at IAS 39.BC75-94, KPMG (2011): p. 1339-1341.

[74] Financial instruments that may or may not be classified as held to maturity are mentioned in IAS 39.AG16-AG19, AG 23.

the held-to-maturity category at all. The restriction is valid for the current and the two following periods (Pellens et al, 2011, p. 567).

5.6.3. Loans and Receivables

Loans and receivables are non-derivative financial assets with fixed or determinable payments that are not quoted in an active market, other than:

- Those that the entity intends to sell immediately or within a short term, which shall be classified as held for trading, and those that the entity upon initial recognition designates as at fair value through profit or loss;
- Those that the entity upon initial recognition designates as available-for-sale; or
- Those for which the holder may not recover substantially all of its initial investment, other than because of credit deterioration, which shall be classified as available-for-sale (IAS 39.9).

The main requirements to qualify as a loan and receivable financial asset are the existence of fixed or determinable payments and that the asset is not a derivative. Additionally the financial asset should not be quoted in an active market[75]. If a financial asset does not qualify for classification as loans and receivables, it may be classified as held-to-maturity investment if it meets the condition for that classification (IAS 39.AG26). In addition, each loan and receivable could also be classified as available-for-sale financial asset on initial recognition.

5.6.4. Available-for-Sale Financial Assets

Available-for-sale financial assets are those non-derivative financial assets that are designated as available-for-sale or are not classified in one of the three other categories of financial assets as (a) loans and receivables, (b) held-to-maturity or (c) financial assets at fair value through profit and loss (IAS 39.9).

An entity may also voluntary classify financial assets that fulfill the classification of (a) loans and receivables, (b) held-to-maturity or (c) financial assets at fair value through profit and

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[75] The meaning of „quoted in an active market" is discussed in more detail in Chapter 5.8.1.1.

loss designate as available-for-sale on initial recognition. Only financial assets held for trading cannot be designated as available-for-sale. [76]

5.6.5. Other Financial Liabilities

Other financial liabilities are not explicitly defined by the IAS 39.9. Financial liabilities that are not held for trading and not designated as at fair value through profit and loss are not included in the four categories. Pellens et al. (2011) suggested considering the other financial liabilities as a fifth category of financial instruments under IAS 39 (Pellens et al, 2006, p. 565).

5.6.6. Reclassification

Financial instruments should or may be reclassified from one category to another subsequent to its initial recognition. However, reclassifications are restricted by a number of detailed conditions that have to be met to impose discipline and avoid tainting implications (IAS 39.50-54, BC73). Therefore the asset to reclassification has to fulfill the definition of the new category into which it is proposed to be reclassified at the time of reclassification (KPMG, 2011, p. 1349).

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[76] As an exemption, equity instruments (equity or equity derivatives), could be measured at cost in the rare circumstances that the fair value is not reliably measureable. Fair value gains and losses are not recognized in this particular case.

Table 3 provides an overview of possible reclassifications of financial assets:

Table 3: Possible Reclassifications of Financial Assets under IAS 39

To: From:	Fair value through profit or loss	Available-for-sale	Held-to-maturity	Loans and receivables
Fair value through profit or loss (non-derivatives held for trading)	N/A	P	P	P
Fair value through profit or loss (derivatives or designated)	N/A	X	X	X
Available-for-sale	X	N/A	P	P
Held-to-maturity	X	R	N/A	X
Loans and receivables	X	P	X	N/A

P – Permitted in certain circumstances

R – Required in certain circumstances

X – Not allowed   Source: IAS 39.50-54, compiled by the author

5.6.6.1.   Reclassifications from the Fair Value through Profit or Loss Category

Financial instruments at fair value through profit or loss can generally not be classified into or out of this category subsequent on initial recognition (IAS 39.50, BC73). However there are a limited number of exemptions mainly caused by the rare circumstances of the financial market crisis. In October 2008, the IASB amended IAS 39 to allow reclassifications of held for trading financial instruments out of the fair value through profit or loss category (IASB 2008b). These amendments permit non-derivative financial assets held for trading to be reclassified (a) as either available-for-sale or held-to-maturity in rare circumstances, and (b) as loans and receivables if they would have met the definition of loans and receivables[77] and if the entity has the intention and ability to hold the financial asset for the foreseeable future

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[77] It is not clearly stated whether the definition should have been met at initial recognition or at the time of reclassification. Both have been seen in practice and are acceptable in the opinion of Ernst & Young (Ernst & Young, 2012, p. 3054).

or until maturity (Fiechter, 2009, p. 2). Reclassification is conditional to the changed purpose of losing the intention to sell or repurchase the financial instrument any longer in the near term. Effects from reclassification can take effect only from the date of reclassification, previous recognized gains or losses are not reversed (IAS 39.103H, 103I).[78]

A reclassification of derivatives and financial instruments designated at fair value through profit or loss on initial recognition is not allowed.

5.6.6.2. Reclassifications from Available-for-Sale Financial Assets

A reclassification from available-for-sale financial assets is permitted (a) to held-to-maturity and (b) to loans and receivables.

a) Once any tainting period ("two preceding financial years") has lapsed, a reclassification from the available-for-sale category to held-to-maturity is permitted or as a result of change in intention or ability (IAS 39.54).

b) The October 2008 amendment to IAS 39 permits financial assets that would have met the definition of loans and receivables (if it had not been classified as available-for-sale) may be reclassified out of the available-for-sale to the loans and receivables category if the entity has the intention and ability to hold the financial asset for the foreseeable future or until maturity (IAS 39.50E).

5.6.6.3. Reclassifications from Held-to-Maturity

In case of the restriction not to use the held-to-maturity category, all financial instruments classified as held-to-maturity are required to be reclassified to the available-for-sale category.

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[78] Certain studies investigate the effects from reclassification out of the held for trading and available-for-sale category to categories measured at cost or amortized cost. For instance, Fiechter (2009) came to the conclusion that European banks extensively used the opportunities to reclassify as provided by the amendments. Reclassifying banks avoid substantial fair value losses and with the result of a statistically positive impact on the key financial indicators. Kholmy and Ernstberger (2010) pointed out that reclassifying European banks vary between banks' size, profitability, analyst coverage and by the law tradition of their home country.

5.6.6.4.   Reclassifications from Loans and Receivables

In case financial assets classified as loans and receivables become quoted in an active market, the respective instruments may be reclassified as available-for-sale. IAS 39 does not comprise a precise definition. A reclassification seems to be acceptable, but is not required. (Ernst & Young, 2012, p. 3057). A subsequent reclassification of loans and receivables to fair value of profit and loss is prohibited (IAS 39.9, 50).

5.6.6.5.   Reclassification of Financial Liabilities

A reclassification of financial liabilities out of or into the fair value through profit or loss after initial recognition is not allowed.

5.7.   Recognition and Initial Measurement of Financial Instruments

This chapter describes the recognition and initial measurement of financial instruments within the scope of IAS 39.

5.7.1. Recognition

Generally an entity must recognize a financial asset or financial liability on its balance sheet when, and only when, the entity becomes a party to the contractual provisions of the instrument (IAS 39.14; IFRS 9.3.1.1). This definition is applicable for common financial instruments and derivate financial instruments.

A regular way purchase or sale of a non-derivative financial instrument that occurs within the time frame established by regulation or convention in the market is accounted at the trade date (when the entity becomes party to the contract) (IAS 39.9, AG45, IFRS 9 Appendix A). A contract that must or can be settled by net settlement is not a regular way contract. Such a contract is accounted for as a derivative by applying settlement date accounting (IAS 39.AG54, IFRS 9.B3.1.4).

5.7.2. Initial Measurement

Financial assets and liabilities at fair value through profit or loss are measured at their fair value on initial recognition. All other financial assets and liabilities are also measured at fair

value, but are adjusted by directly attributable transaction costs or issue of the financial asset or financial liability (IAS 39.43, IFRS 9.5.1.1).

The initial fair value is the amount for which an asset could be exchanged, or a liability settled, between knowledgeable, willing parties in an arm's length transaction (IAS 39.9).[79] In practice, the initial fair value will normally be the transaction price. IAS 39 (IFRS 9) assumes that the transaction price is the best evidence of fair value. In case the fair value could not be obtained by the transaction price, a valuation technique has to be applied (IAS 39.AG64, IFRS 9.B5.1.1).

Transaction costs are incremental costs that are directly attributable to the acquisition, issue or disposal of a financial asset or financial liability. An incremental cost is one that only incurred because an entity acquired, issued or disposed the respective financial instrument (IAS 39.9, IFRS 9 Appendix A). The fair value of financial assets and liabilities not at fair value through profit or loss has to be reduced by the transaction costs. Transaction costs that occur for financial assets and liabilities at fair value through profit or loss are directly recognized in the profit or loss (IAS 39.E.1.1, IFRS 9.E.1.1).

5.8. Subsequent Measurement of Financial Instruments

At initial recognition, financial assets and financial liabilities have to be classified into the categories as defined by IAS 39 (see also chapter 0 Classification of Financial Instruments). Following the initial recognition, each respective category applies to divergent subsequent measurement and profit and loss recognition:

- Held-to-maturity investments and loans and receivables shall be measured at amortized cost using the effective interest method, although they are subject to review for impairment. Gains and losses from impairment or derecognition are considered in the profit or loss at the time of occurrence, as well as through the amortization process;

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[79] The definition of fair value and the IFRS fair value guidance is already adjusted and will be forthcoming regulated by IFRS 13 "Fair Value Measurement". The new standard will be applicable for annual periods beginning on or after 1 January 2013, however earlier application is permitted (IFRS 13.C1). Until IFRS 13 "Fair value measurement" was issued, guidance on how to measure fair value was included in the various IFRS that require or permits its use. The development of IFRS 13 was a convergence project between the IASB and the US Financial Accounting Standards Board (FASB) to have a consistent definition of fair value and provides a coherent framework for measuring fair value.

- Financial assets at fair value through profit or loss (including derivatives that are not designated in effective hedging relationships) and available-for-sale financial assets are measured at fair value. The fair value changes of financial assets at fair value through profit or loss are directly included in the profit or loss, for available-for-sale assets, initially in other comprehensive income. When the available-for-sale asset is derecognized or impaired, the cumulative gain or loss in other comprehensive income is reclassified from equity to profit or loss;
- Financial liabilities at fair value through profit or loss, including derivatives, shall be measured at fair value with changes therein included in profit or loss and other financial liabilities are measured at amortized cost using the effective interest method. Gains and losses from derecognition of other financial liabilities are considered in the profit and loss at the time of occurrence, as well as through the amortization process (IAS 39.43, 46, 47, 55b, 56).

Financial instruments that are designated as hedged items are subject to further hedge accounting requirements (see also chapter 5.10 Hedge Accounting of Financial Instruments).

The requirements for the categories are summarized in the following table:

Table 4: Subsequent Measurement and Recognition of Gains and Losses

Classification	Instrument type	Balance sheet	Fair value gains and losses	Interest and dividends	Impairment	Foreign exchange
At fair value through profit and loss*	Debt, Equity or Derivative	Fair value	Profit or loss	Profit or loss	Profit or loss (assets)	Profit or loss
Held-to-maturity	Debt	Amortized cost	-	Profit or loss: effective interest rate	Profit or loss	Profit or loss
Loans and receivables	Debt	Amortized cost	-	Profit or loss: effective interest rate	Profit or loss	Profit or loss
Available-for-sale*	Debt	Fair value	Other comprehensive income	Profit or loss: effective interest rate	Profit or loss	Profit or loss
	Equity	Fair value	Other comprehensive income	Profit or loss: dividends receivable	Profit or loss	Other comprehensive income
Other financial liabilites	Debt	Amortized cost	-	Profit or loss: effective interest rate	-	Profit or loss

*As an exemption, equity instruments (and derivatives that are linked to these instruments) that do not have a quoted market price and whose fair value cannot be relibly measured shall therefore be measured at cost.

Source: IAS 39.45-47, compiled by the author

5.8.1. Fair Value

The fair value is defined in IAS 39 as the amount, for which an asset could be exchanged, or a liability settled, between knowledgeable and willing parties in an arm's length transaction. Transaction costs expected to be incurred on transfer or disposal of the financial instrument are not taken into account by determining the fair value (IAS 32.11, 39.9, IFRS 9.A).

Underlying the definition of fair value is a presumption that the entity is a going concern without any intention or need neither to liquidate instruments nor to undertake a transaction on adverse terms. In general the fair value is not the amount an entity would receive or pay in a forced transaction [80], involuntary liquidation or distress sale (IAS 39.AG69, IFRS 9.B.5.4.1).

The IASB's objective in determining the fair value could be summarized as the price at which an orderly (not forced) transaction would take place between market participants at the transaction date.

The fair value should be reliably measureable. IAS 39 and its application guidance provide detailed advice on how the fair value of financial assets and liabilities should be measured. In particular, it requires a hierarchical approach to fair value measurement.

An entity should use the best available fair value that is closest to a market transaction. If a market for a financial instrument is not active, meaning observable market prices could not be obtained; an entity has to determine the fair value by using a valuation technique. This concept leads to the three-level measurement hierarchy implicit in IAS 39[81]:

   a) Fair value of financial instruments for which there exist quoted market prices in an active market (Level 1); or, if not available
   b) Fair value is evidenced by comparison with other observable current market data of transactions in the identical instrument (i.e. without modification or repackaging)

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[80] Indicators of a forced transaction may include:
A legal requirement to transact;
A necessity to dispose of an asset immediately without sufficient time to market or price the asset;
The existence of a single potential buyer imposed by legal or time restrictions; or
A seller that needs to sell where there is only one or very few buyers (GPPC 2007; IASB 2008f).
[81] The three-level-hierarchy in IFRS 7 is expressed differently from the one in IAS 39. In the interest of convergence, the IASB already adopted in IFRS 7 the same hierarchy according to US GAAP pending completion of their accommodating fair value measurement project.

or based on a valuation technique or model fully reflected by using data from observable markets (Level 2); or, if not available

c) Fair value is determined in whole or in part using a valuation technique or model that best reflects observable market data. The data may be based on assumptions that are not supported by observable current market data of transactions in the identical instrument (i.e. without modification or repackaging) and not based on observable market data (Level 3) (IAS 39.48A, AG69-AG 82, IFRS 9.5.4.2, B5.4.1-B5.4.13).

5.8.1.1. Quoted Market Prices in an Active Market

A published price quotation in an active market is the best evidence of fair value (IAS 39.48A, AG71, BC97, IFRS 9.5.4.2, B5.4.3). A financial instrument is quoted in an active market if quoted prices are readily and regularly available from an exchange, dealer, broker, industry group, pricing service or regulatory agency, and those prices represent actual and regularly occurring market transaction on an arm's length basis (IAS 39.AG71, IFRS 9.B5.4.3). The IASB argues that quoted prices in an active market are the best indicator of fair value because:

a) In an active market, the best evidence of fair value is the quoted price, given that fair value is defined in terms of price agreed by knowledgeable, willing buyer and a knowledgeable, willing seller;

b) It results in a consistent measurement across entities; and

c) Fair value as defined does not depend on entity-specific factors (IAS 39.BC97, IFRS 9.BCZ5.2-BCZ5.3).

Subsequently the objective in determining the fair value for a financial instrument that is traded in an active market is to arrive at the price at which a transaction would occur in the entities most advantageous[82] market at the transaction date in a particular instrument (IAS 39.AG71). However, IAS 39 gives no further detailed guidance of an active market. Ernst & Young (2012) mentioned that in practice, quoted market prices in an active market generally include most financial instruments traded on regulated exchanges, but also stated out, that a

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[82] The most advantageous active market is the one to which the entity has immediate access. However, the entity adjusts the price in the more advantageous market to reflect any differences in counterparty credit risk between instruments traded in that market and the one being valued (IAS 39.AG71).

quoted price does not automatically mean there is an active market in a particular financial instrument. For instance, rarely traded debt securities may have a "technical" listing on an exchange for credit rating purposes. On the other hand, the existence of a regulated exchange is not always necessarily required (Ernst & Young, 2012, p. 3142). KPMG (2011) suggested the following indicators as characteristics of an inactive market:

a) A significant decline in trading volume and level of trading activity;
b) A significant variation in available prices over time or between market participants;
c) No current available prices;
d) Significant trading volume between related parties (IASB 2008f, KPMG, 2011, p. 1399).

As a response to the financial market crisis, the Committee of European Banking Supervisors published a statement "Fair value measurement and related disclosures of financial instruments in illiquid markets" (based on the consultation paper "Determining Fair Value of Financial Instruments under IFRS in Current Market Conditions" developed by the Global Public Policy Committee of the six largest international accounting networks in December 2007) in June 2008. The significant reduction in the liquidity market and the shrinking availability of credit resulted in a dry out of particular active markets. Therefore the committee provides guidance how to handle financial instruments previously considered to be quoted in active markets. It also determines whether a financial instrument should be further considered at fair value or instead be estimated using a valuation technique (Committee of European Banking Supervisors, 2008, IASB 2008f).

The existence of an active market is a matter of judgment and depends on several facts and circumstances of the respective market. However this characterization is not linked to a consistent number of transactions in a defined period. If enough transactions occur frequently to obtain reliable pricing information on an ongoing basis, then the market remains to be considered active (GPPC, 2007; IASB 2008f). If arm's length transactions are no longer regularly occurring (even if prices are available) or only forced transactions or distressed sales are observable, then the market would be considered as inactive (GPPC, 2007). If the market for financial instruments is not active, an entity shall establish a valuation technique to obtain the fair value (IAS 39.48A). But, the best evidence of determining the fair value should

be an active market. Even if an entity believes that valuation models are more appropriate[83], they still have to use the price quotation in an active market.

The best evidence to determine the fair value of a financial instrument is a quoted price in an active market (IAS 39.48A). If a quoted price in an active market is not available, the entity generally has to establish the fair value by using a valuation technique (IAS 39.48A, AG 74). As an exemption, investments in equity instruments that do not have a quoted market price in an active market and whose fair value cannot be reliably measured and derivatives that are linked to and must be settled by delivery of such unquoted equity instruments, which shall be measured at cost (IAS 39.46c). The following overview summaries the determination of fair value.

Figure 10: Determination of Fair value

Financial instrument has a quoted price in an active market	Use quoted price
Financial instrument is an equity investment or connected derivative, whose fair value can not reliably measured	Measurement at cost
All other financial instruments	Use a valuation technique
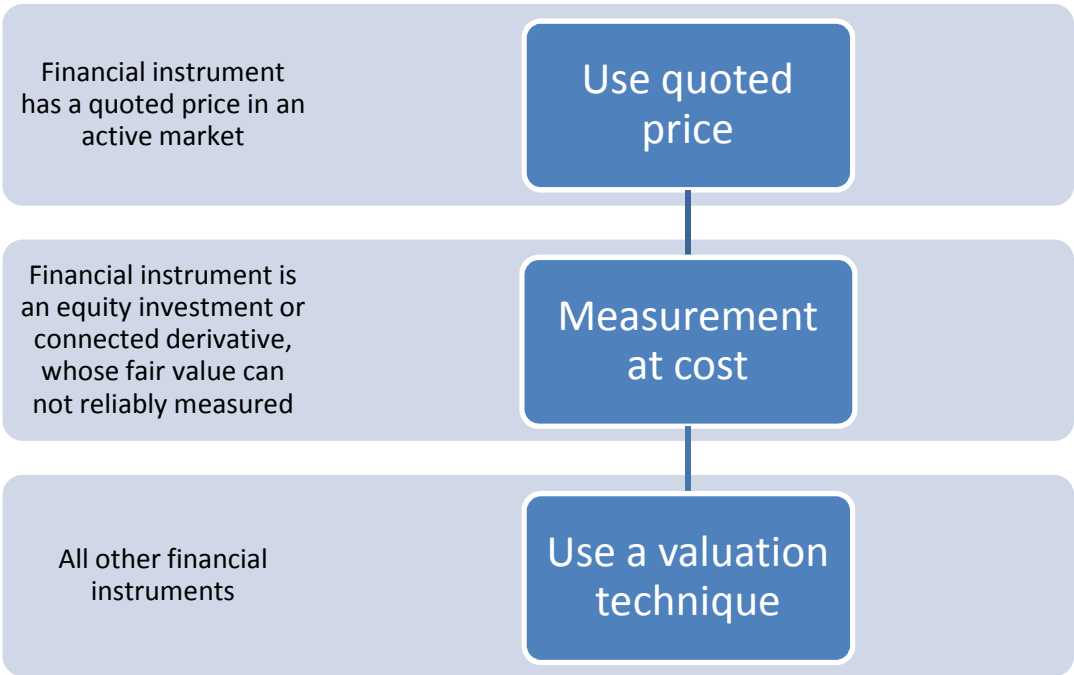
Source: IAS 39.48A, AG74, compiled by the author

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[83] This includes valuation models that are consistent with industry best practice and even where they are accepted for regulatory purposes (IAS 39.BC96-97).

5.8.1.2. Valuation Technique

The objective of using a valuation technique is to determine what the transaction price would have been on the transaction date on an arm´s length basis (IAS 39.48A, AG74, IFRS 9.B5.4.6). Valuation techniques include using recent arm's length transactions by normal business considerations, reference to the current fair value of another instrument that is substantially the same, discounted cash flow analysis and option pricing models. If there exists a commonly used valuation technique and that technique has been demonstrated to provide reliable estimates[84] of prices obtained in actual market transactions, that technique should be used (IAS 39.48A, AG74, IFRS 9.B5.4.6). The chosen valuation technique should make maximum use of market inputs and relies as little as possible on entity-specific inputs. It should reflect current market conditions that market participants would consider in setting a price and be consistent with the accepted economic methodologies for pricing financial instruments and other factors that are likely to affect the fair value (IAS 39.AG75, IFRS 9.B5.4.8).

The fair value at initial recognition is best reflected by the transaction price unless fair value is evidenced by comparison with other observable current market transactions in the same instrument or based on a valuation technique whose variables include only data from observable markets (IAS 39.AG76, IFRS 9.B5.4.8). Thus a profit or loss should only be recognized up to a certain extent on initial recognition of a financial instrument (IAS 39.AG76, IFRS 9.B.5.4.9)[85].

If more than one valuation model is used and various significant different outcomes are obtained, than judgment should be used in determining which outcome is likely to be the most reliable (IAS 39.AG81).

5.8.1.3. Inputs to Valuation Techniques

While using appropriate valuation techniques to determine the fair value of a financial instrument, incorporate observable market data about the market conditions and other factors that are likely to affect the fair value of a financial instrument have to be considered. IAS 39.AG82

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[84] The valuation technique should be tested for validity regularly so that the technique can be recalibrated as required (IAS 39.AG76, IFRS 9.B5.4.8).
[85] IAS 39.AG76A (IFRS 9.B5.4.9) pointed out that in such a case, it is requires that a gain or loss shall be recognized after initial recognition only to the extent that it arises from a change in a factor (including time) that market participants would consider in setting a price.

(IFRS 9. B5.4.13) defines that the fair value of a financial instrument will be based on one or more of the following factors (or perhaps others):

a) Time value of money (i.e. interest at the basic or risk-free rate): Risk-free interest rates may be derived from observable government bond prices (alternative from higher rated corporate bonds if government bonds have a lower credit rating and a higher borrowing rate than these corporate bonds) and are often quoted in financial publications. For practical reasons, an entity may use a well-accepted and readily observable general rate, such as LIBOR or a swap rate, as the benchmark rate.

b) Credit risk (i.e. the premium over the basic interest rate for credit risk): An appropriate credit spread may be derived from observable market prices for corporate bonds of similar credit quality or from observable interest rates charged by lenders for loans of various credit ratings.

c) Foreign currency exchange prices: Active currency exchange prices may be derived from published financial publications or databases that exist for most major currencies, and are normally quoted daily.

d) Commodity prices: For many commodities are observable market prices available.

e) Equity prices: Many traded equity instruments have observable market prices. If not available, a present value based technique may be used to estimate the current market price of equity instruments for which there are no observable prices.

f) Volatility (i.e. magnitude of future changes in price of the financial instrument or other item): Measures of the volatility of actively traded items may be reasonably estimated on the basis of historical market data or by using volatilities implied in current market prices.

g) Prepayment risk and surrender risk: Expected prepayment patterns for financial assets and expected surrender patterns for financial liabilities can be estimated on the basis of historical data.

h) Servicing costs for a financial asset or a financial liability: Costs of servicing can be estimated using comparisons with current fees charged by other market participants. If the costs of servicing a financial asset or financial liability are significant and other market participants would face comparable costs, the issuer would consider them in determining the fair value of that financial asset or financial liability.

5.8.2. Amortized Cost and the Effective Interest Method

The amortized cost is defined as the amount of a financial asset or financial liability at which the financial asset or financial liability is measured at initial recognition minus principal repay-

ments, plus or minus the cumulative amortization using the effective interest method of any difference between that initial amount and the maturity amount, and minus any reduction (directly or through the use of an allowance account) for impairment or non-collectability. The effective interest method is used for amortizing premiums, discounts and transaction costs over the relevant period of the financial asset or financial liability (IAS 39.9).

The effective interest rate is the rate that exactly discounts the estimated future cash flows over the expected life of the financial instrument or, when appropriate, a shorter period of the net carrying amount of the financial instrument. It allocates the interest income or expense over the expected lifetime. The calculation of the effective interest rate should consider all contractual terms, i.e. all fees and points paid or received between parties to the contract that are integral, transaction costs, embedded derivatives, and all other premiums or discounts, but without inclusion of future credit losses or expected future defaults[86]. The effective interest method is normally based on estimated, not contractual, cash flows of a group of similar financial instruments and that these cash flows and the expected life of a financial instrument can be estimated reliably. In the rare case that the cash flow cannot be estimated reliably, the contractual cash flows over the full contractual term are used (IAS 39.9, BC30-32).

5.8.3. Foreign Currency

An entity may have foreign currency exposure from transactions in foreign currencies or from investments in foreign operations. The principles for foreign currency transactions as applied in IAS 21 "The Effects of Changes in Foreign Exchange Rates" are also valid for financial instruments. Therefore, an entity has to consider all financial instruments in the foreign currency in which it is denominated, independent from its classification or measurement. After that, the entity has to translate all foreign currency items into its functional currency[87] and has to report the translation effects (IAS 21.8, 17).

Changes in the carrying amount of a financial instrument are reported either in profit or loss or in other comprehensive income. The handling depends on several factors, whether the translation effect is an exchange difference or other change in carrying value, whether the

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[86] Future credit losses are not considered as this would be a departure from the incurred loss model for impairment.
[87] Functional currency is the currency of the primary economic environment in which the entity operates (IAS 21.8)

financial instrument is a monetary or non-monetary item[88] and whether it is designated as part of a foreign currency cash flow hedge or hedge of a net investment.[89]

5.8.4. Impairment

All financial assets except those measured at fair value through profit or loss are subject to impairment (IAS 39.46). At least at each balance sheet date an entity has to assess whether there is objective evidence that impairment exists for a financial asset or a group of financial assets. If there is no objective evidence of impairment need, normally no further steps have to be taken into account. On the other hand, if any such evidence of impairment exists, the entity shall determine and recognize the amount of impairment loss (IAS 39.58).

5.8.4.1.   Objective Evidence of Impairment

The definition of objective evidence requires one or more events that occurred after the initial recognition of the asset (a loss event) and that this loss event has an impact on the estimated future cash flows of the financial asset or group of financial assets that can be reliably estimated. Expected losses caused by future events are generally not recognized, no matter how likely (incurred loss model). But the combined effect of several loss events could result in objective evidence of impairment (IAS 39.59).

It is not possible to pinpoint one[90] single, discrete event that caused the impairment. Rather the combined effect of several events may have caused the impairment (IAS 39.59, IFRIC 2004). Indicators for loss events that may result in a need for impairment are:

a) Significant financial difficulty of the issuer or obligor;
b) A breach of contract, such as a default or delinquency in interest or principal payments;
c) Renegotiation of the terms of an asset because of financial difficulty;
d) Probability that the borrower will enter bankruptcy or other financial reorganization;
e) The disappearance of an active market for that asset because of financial difficulties; or

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[88] Monetary items are units of currency held and assets and liabilities to be received or paid in a fixed or determinable number of units of currency; and vice versa for non-monetary items (IAS 21.8).
[89] For a more detailed guidance see for example KPMG (2011): p. 1418-1422.

f) Observable data indicating that there is a measurable decrease in the estimated future cash flows from a group of financial assets since their initial recognition, although the decrease cannot yet be identified with the individual assets in the group (IAS 39.59).

Especially for equity instruments, an entity should also take into consideration:

a) The information about significant changes with an adverse effect that have taken place in the technological, market, economic or legal environment in which an issuer operates; and

b) A permanent and significant decrease in the fair value of a financial asset below its amortized cost (IAS 39.61).

A delisting of a financial instrument, a downgrade of an entities credit rating or a decline in the fair value of a financial asset below its amortized cost are not necessarily indicators for evidence of impairment (IAS 39.60).

5.8.4.2. Impairment Loss Calculation

If there is objective evidence of impairment for a financial asset, the amount of any impairment loss has to be determined. The measurement of the impairment depends on the respective classification of financial asset. It differs for assets measured at amortized cost and available-for-sale assets.

An impairment loss for assets carried at amortized cost is measured as the difference between the asset's carrying amount and the present value of estimated future cash flows[91] discounted at the financial asset's original effective interest rate[92]. If any collateral is held for the financial asset, it should be reflected in the calculation of the present value. The carrying amount shall be reduced either directly or through use of an allowance account and the loss amount shall be recognized in profit or loss (IAS 39.63, AG84).

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[91] Future cash flows include only those losses that have been incurred before the reporting date (incurred loss model). See also chapter 5.8.4.1. and IAS 39.59, 63.
[92] The effective interest rate computed at initial recognition is used in calculating the impairment loss because discounting at the current market rate would impose fair value measurement on financial assets measured at amortized cost (IAS 39.63, AG84).

Common fair value changes of an available-for-sale financial asset are recognized directly in equity (in other comprehensive income) rather than in profit or loss. When there is objective evidence of impairment, the cumulative loss [93] in the other comprehensive income is reclassified from equity to profit and loss. Once an available-for-sale asset has been impaired, all subsequent losses of this particular asset are recognized in profit or loss until it is derecognized (IAS 39.67, IGE.4.9).

5.9. Derecognition of Financial Instruments

This chapter deals with the specific provisions for derecognition of financial assets and liabilities. The requirements are designed to deal with derecognition of financial assets, but in practice many of the rules for derecognition are also rules to recognize a liability. This is because the derecognition rules of IAS 39 (IFRS 9) had to deal with various types of off-balance sheet items (Ernst & Young 2012: p. 3210).

5.9.1. Derecognition of Financial Assets

The following flow chart summarizes the derecognition of financial assets:

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[93] The cumulative loss shall be the difference between the acquisition cost (equity instrument) or amortized cost (debt instrument) and current fair value, less any impairment loss on that financial asset previously recognized in profit or loss (IAS 39.68).

Figure 11: Derecognition of Financial Assets
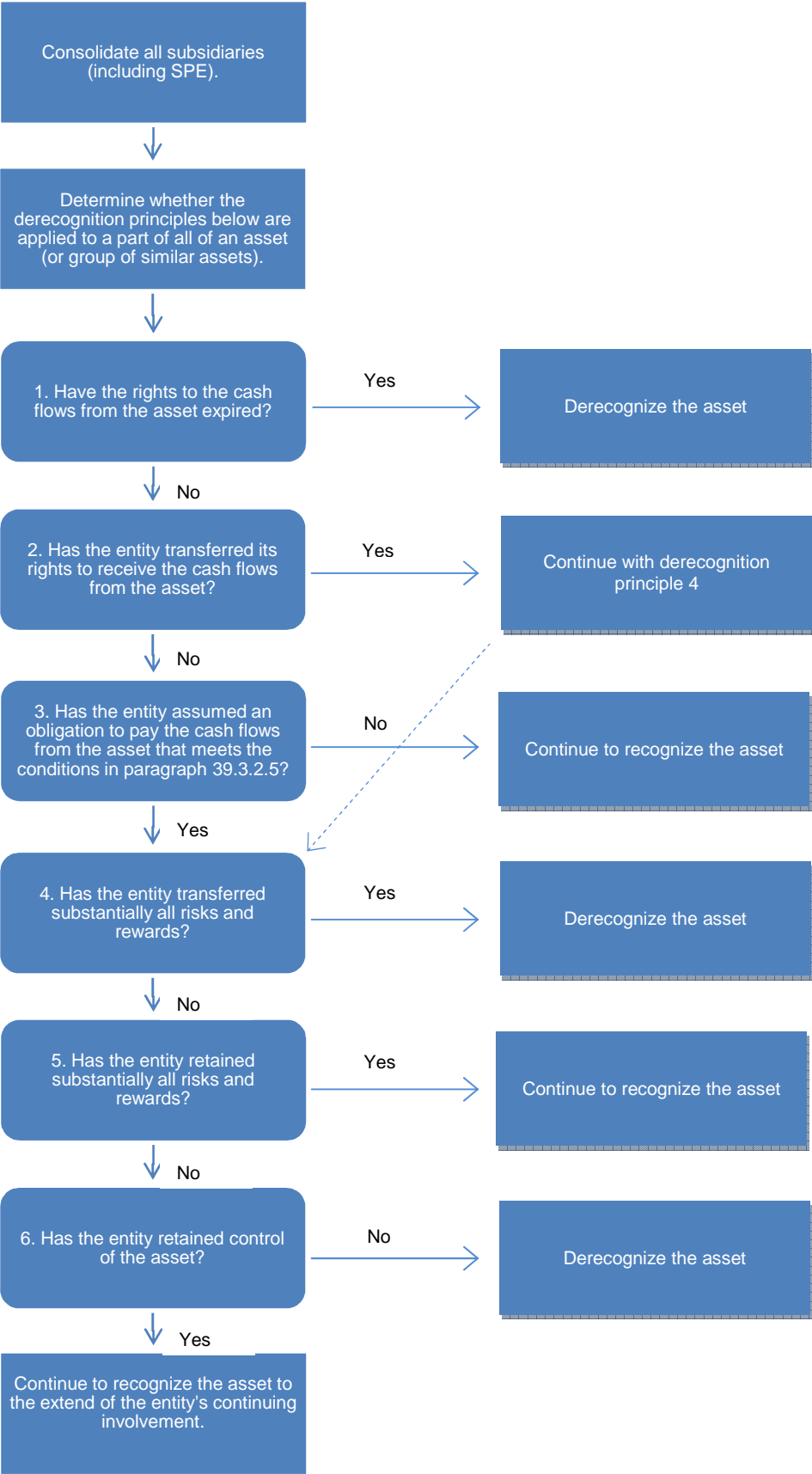
Derecognition requirements of IAS 39 (IFRS 9) are mainly based on two accounting concepts, the "risk and rewards" model and the "control" model[94]. After consolidation of all subsidiaries an entity shall analyze whether the contractual rights to the cash flows from the financial asset have expired or been transferred. If they have, the asset is derecognized. The contractual right to receive cash flows may be expired when, for example, a loan receivable is repaid or a purchased option expired unexercised. (IAS 39.17, 18, IFRS 9.3.2.3). A financial asset is transferred if it either:

a) Transfers the contractual rights to receive the cash flow of the financial asset; or
b) Retains the contractual rights to receive the cash flows of the financial asset, but assumes a contractual obligation to pay the cash flows to one or more recipients in an arrangement that meet the following conditions:
   a. The entity has no obligation to pay amounts to the eventual recipients unless it collects equivalent amounts from the original asset. Short-term advances by the entity with the right of full recovery of the amount lent plus accrued interest at market rates do not violate this condition.
   b. The entity is prohibited by the terms of the transfer contract from selling or pledging the original asset other than as security to the eventual recipients for the obligation to pay them cash flows.
   c. The entity has an obligation to remit any cash flows it collects on behalf of the eventual recipients without material delay. In addition, the entity is not entitled to reinvest such cash flows, except for investments in cash or cash equivalents during the short settlement period from the collection date to the date of required remittance to the eventual recipients, and interest (IAS 39.AG 37, IFRS 9 B.3.2.2-B.3.2.4).

Once an entity has transferred a financial asset, it shall evaluate the extent to which it retains the risk and rewards of ownership of the financial asset (IAS 39.20, IFRS 9.3.2.6). If the risk and rewards of the financial asset are substantially transferred, the entity shall derecognize it (IAS 39.20a, IFRS 9.3.2.6a).

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[94] The difference between the `risk and rewards´ model and the `control´ model may lead to a different outcome.

If the risk[95] and rewards are not substantially transferred, i.e. the risk and reward of the financial asset retain with the entity, the entity continues to recognize the financial asset (IAS 39.20b, IFRS 9.3.2.6b).

If the entity has neither substantially transferred nor retained all the risk and rewards of the financial asset, the entity determines whether it has retained control of the financial asset. If the entity has not retained control, it must derecognize the financial asset and recognize separately any rights and obligations created or retained by the transfer as financial asset or liability. If the entity has retained control, it must continue to recognize the financial asset to the extent of its continuing involvement in the financial asset (IAS 39.20c, IFRS 9.3.2.6c). Retained control is defined by IAS 39 (IFRS 9) as the transferee's ability to sell the asset. If the transferee:

a) Has the ability to sell the asset in its entirety to an unrelated third party; and
b) Is able to exercise that ability unilaterally and without needing to impose additional restrictions,
c) thus the entity has not retained control. In all other cases, it has retained control (IAS 39.23, IFRS 9.3.2.9).

If the entity has retained control of the transferred asset, it prolongs to recognize the transferred asset to the extent of its continuing involvement. The extent of the entity's continuing involvement in the transferred asset is the extent to which it is exposed to changes in the value of the transferred asset (IAS 39.20c[ii], 30, IFRS 9.3.2.6[ii], 9.3.2.16). As a result, the entity has to recognize the financial asset to the extent of its continuing involvement and at the same time the entity recognizes an associated liability. The transferred asset and the associated liability[96] reflect the rights and obligations that the entity has retained (IAS 39.31, IFRS 9.3.2.17).

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[95] Different risk types can be: Price risk (inherent risk in equity instruments), credit risk, interest rate risk, late payment risk (inherent risks in debt instruments), currency risk and other risks (inherent in both equity and debt instruments).
[96] The transferred asset and the associated liability should not be offset (IAS 39.36, IFRS 9.3.2.22).

Derecognition of transferred assets used as non-cash collateral (such as debt or equity instruments) depends on whether the right of the transferee to sell or repledge the collateral and on whether the transferor has defaulted. IAS 39.37 (IFRS 9.3.2.23) clarifies that

a) In the general case the transferor shall continue to carry the collateral as its asset, and the transferee shall not recognize the collateral as an asset.

b) If the transferee has the right by contract or custom to sell or repledge the collateral, then the transferor shall reclassify that asset separately in its statement of financial position (e.g. as a loaned asset, pledged equity instruments or repurchase receivable).

c) If the transferee sells collateral pledged to it, it shall recognize the proceeds from the sale and a liability measured at fair value for its obligation to return the collateral.

d) If the transferor defaults under the terms of the contract and is no longer entitled to redeem the collateral, it shall derecognize the collateral, and the transferee shall recognize the collateral as its asset initially measured at fair value or, if it has already sold the collateral, derecognize its obligation to return the collateral.

5.9.2. Derecognition of Financial Liabilities

A financial liability is derecognized (or part of a financial liability) from the statement of financial positions when and only when, it is extinguished, i.e. it is discharged, cancelled or expired. A financial liability extinguished when:

a) The debtor made payment to the lender, normally with cash, goods, services or other financial assets; or

b) The debtor is legally released from primary responsibility for the liability (or part of the liability); or

c) An existing debt instrument is substantially modified[97] or exchanged by a debt instrument with substantially modified terms (IAS 39.39, 40, AG57-63, IFRS 9.3.3.1, 2, B3.3.1-7).

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[97] `Substantial modified´ is defined as the discounted present value of the cash flows under the new terms (including any fees) differ at least 10 per cent from the original discounted present value of cash flows (IAS 39.AG62, IFRS 9.B3.3.6).

5.10. Hedge Accounting of Financial Instruments

Hedge accounting allows an entity under certain circumstances to measure assets, liabilities (unrecognized) firm commitments and forecast transactions on a basis different from that otherwise stipulated in IFRSs or to defer the recognition of derivative gains and losses in profit or loss. It recognizes the offsetting effects on profit or loss of changes in the fair values of the hedging instrument and the hedged item (IAS 39.85, IFRS 9). Hedge accounting is applied to somehow `correct´ deficiencies in accounting requirements that would otherwise be detrimental for the presentation of financial statements. As IAS 39 (IFRS 9) uses a mixed measurement model, this could result in an accounting mismatch in profit or loss, which subsequent result in volatility in reported results.

The standard distinguishes between three hedge accounting relationships: fair value hedges of fair value exposure, cash flow hedges of cash flow exposures and net investment hedges of currency exposure on a net investment in foreign operation. Hedge accounting is voluntary; however, an entity has to fulfill certain documentation and effectiveness requirements to use hedge accounting.

5.10.1. Hedging Instruments and Hedged Items

The two main components of a hedge relationship are the hedging instrument and the hedged item. These and related terms are defined by IAS 39 as follows:

a) Hedging instrument: a designated derivative or (for a hedge of the risk of changes in foreign currency exchange rates only) a designated non-derivative financial asset or non-derivative financial liability whose fair value or cash flows are expected to offset changes in the fair value or cash flows of a designated hedged item.

b) Hedged item: a hedged item is an asset, liability, firm commitment, highly probable forecast transaction or net investment in a foreign operation that (i) exposes the entity to risk of changes in fair value or future cash flows and (ii) is designated as being hedged.

c) Firm commitment: a binding agreement for the exchange of a specified quantity of resources at a specified price on a specified future date or dates.

d) Forecast transaction: an uncommitted but anticipated future transaction (IAS 39.9).

Only instruments that involve an external party to the reporting entity can be designated as hedging instruments (IAS 39.73).

IAS 39 determines two different approaches regarding the accounting for hedging relationships:

- Whenever possible, the hedging instrument and the hedged item are measured analogous. The resulting gains or losses of the hedging instrument and of the hedged item offset each other and are `perfectly´ recognized in profit or loss.
- If this is not possible, the changes in fair value of the hedging instrument are recognized in other comprehensive income till the hedged item affects profit or loss.

5.10.2. Types of Hedging Relationships

In the terminology of IAS 39 (IFRS 9) the three types of hedging relationships are:

a) Fair value hedge: a hedge of the exposure to changes in fair value of a recognized asset or liability or an unrecognized firm commitment, or an identified portion of such an asset, liability or firm commitment, that is attributable to a particular risk and could affect profit or loss.
b) Cash flow hedge: a hedge of the exposure to variability in cash flows that
    (i) is attributable to a particular risk associated with a recognized asset or liability (such as all or some future interest payments on variable rate debt) or a highly probable forecast transaction and
    (ii) could affect profit or loss.
c) Hedge of a net investment in a foreign operation as defined in IAS 21. (IAS 39.86, IFRS 9.

A valid hedging relationship has to meet the following conditions cumulative to qualify for hedge accounting purposes:

a) At the inception of the hedge there is formal designation and documentation of the hedging relationship and the entity's risk management objective and strategy for undertaking the hedge. That documentation shall include identification of the hedging instrument, the hedged item or transaction, the nature of the risk being hedged and how the entity will assess the hedging instrument's effectiveness.
b) The hedge is expected to be highly effective.
c) For cash flow hedges, a forecast transaction that is the subject of the hedge must be highly probable and must present an exposure to variations in cash flows that could ultimately affect profit or loss.

d) The effectiveness of the hedge can be reliably measured and the fair value of the hedging instrument can be reliably measured.

e) The hedge is assessed on an ongoing basis and determined actually to have been highly effective throughout the financial reporting periods for which the hedge was designated.

When entering into a derivative hedging instrument to reduce or eliminate fair value risk exposure of a non-derivative financial asset or liability as at fair value through profit or loss, an entity could also apply the fair value option (see also chapter 5.6.1.2 Financial Assets and Liabilities Designated at Fair Value through Profit or Loss), rather than hedge accounting. Therefore neither an assessment of effectiveness nor rigorous documentation is required.[98] However, the conditions that qualify for the fair value option have to be fulfilled.

5.10.3. Effectiveness Testing

To qualify for hedge accounting, a hedge should be highly effective. Highly effective considers the recognition of the offsetting effects on profit or loss of changes in the fair value of the hedging instrument and the hedged item. A hedge relationship is regarded at inception and at subsequent assessments as highly effective if:

a) the principal terms of the hedging instrument and of the hedged asset, liability, firm commitment or highly probable forecast transaction are the same;

b) the fair value of the derivative at inception is zero;

c) the hedging period and quantity are consistent;

d) none of the items in the hedged portfolio become significantly impaired or be derecognized;

e) the hedge is assessed on an ongoing basis and the actual results of the hedge are within the range of 80-125 percent[99] (IAS 39.88b, AG105b, AG108, AG124).

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[98] In some situations hedge accounting is even unnecessary because there is no accounting mismatch, for example: hedged item and derivative hedging instrument are remeasured to fair value through profit or loss (IAS 39.IGF.1.1).

[99] The method or methods used to measure effectiveness are not explicitly defined by the IFRSs. The individual method an entity adopts depends on its risk management strategy and hedge accounting systems and practices. There is no need to adopt a consistent method for all hedge relationships, but the method used has to be determined in the respective hedge documentation (IAS 39.88a, AG107).

An entity tests effectiveness periodically. If one of these tests fails, then hedge accounting may not be applied to a particular hedge relationship [100]. Ineffectiveness should be recognized immediately in profit or loss. (IAS 39.95b, 102b, AG126). In general, a hedge relationship should be discontinued prospectively if:

a) the hedged transaction is no longer highly probable;
b) the hedging instrument expires or is sold, terminated or exercised;
c) the hedged item is sold, settled or otherwise disposed of;
d) the hedge is no longer effective;
e) the entity revokes the designation (IAS 39.101).

Hedge accounting should normally be discontinued from the last date on which compliance with hedge effectiveness was demonstrated. Alternatively, if a certain event or change in circumstances can be identified that changes the hedging relationship to fail the effectiveness criteria, the hedge relationship should be discontinued from the date of the event or change of circumstances (IAS 39.AG113).

5.11. Presentation and Disclosure of Financial Instruments

Since 1995 the presentation and disclosure of financial instruments as well as when an entity is allowed to offset financial assets and liabilities were stated in IAS 32 *Financial Instruments: Disclosure and Presentation*. The IAS 32 disclosure requirements applied to banks and non-banks. Besides IAS 32 the IAS 30 *Disclosures in the Financial Statements of Banks and Similar Financial Institutions* existed which contained further disclosure requirements for banks and other financial institutions, but also overlapped with the IAS 32 requirements. The affection of the IASB was also to consider fundamental changes in the financial services industry and the way entities are measuring and managing exposure to risk arising from financial instruments. As a consequence, the IASB issued IFRS 7 *Financial Instruments: Disclosures* in August 2005. IFRS 7 superseded IAS 30, deleted the disclosure requirements in IAS 32 and simplified the disclosures regarding concentrations of risk, credit risk, liquidity risk and market risk (IFRS 7.IN1-3). The title of IAS 32 was amended to *Financial Instruments: Presentation*.

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[100] Effectiveness shall be tested for each particular hedge relationship separately. A single ineffective hedge relationship has no consequences to other hedge relationships.

5.11.1. Disclosure Requirements under IFRS 7

The scope of IFRS 7 is to enable users to evaluate:

a) the significance of financial instruments for the entity's financial position and performance; and

b) the nature and extent of risks arising from financial instruments to which the entity is exposed during the period and at the end of the reporting period, and how the entity manages those risks (IFRS 7.1).

The significance of financial instruments should result from the disclosure principle to disclose sufficient information that enables users of financial statements to evaluate the significance of financial instruments for an entity's financial position and performance (IFRS 7.7). This overriding principle could only be satisfied unless other specific disclosures are also fulfilled. The other specific disclosures include disclosure of fair values and assumptions behind the calculations, information on items designated at fair value through profit or loss and on reclassification of financial assets between categories, hedge accounting disclosures as well as details of accounting policies. (IFRS 7.8-30, B5, BC13).

An entity shall group their financial instruments into classes and provide sufficient information. Especially for the following categories of financial assets and financial liabilities comprehensive disclosure requirements exist, either in the statement of financial positions or in the notes:

a) financial assets at fair value through profit or loss;
b) held-to-maturity investments;
c) loans and receivables;
d) available-for-sale financial assets;
e) financial liabilities at fair value through profit or loss;
f) financial liabilities measured at amortized cost (IFRS 7.8).

Information regarding the nature and extend of risks arising from financial instruments shall be disclosed to the extent that users are able to evaluate these risks to which the entity is exposed at the reporting date (IFRS 7.31). Characteristic risk-types are:

a) Credit risk: The risk that one party to a financial instrument will cause a financial loss for the other party by failing to discharge an obligation.

b) Liquidity risk: The risk that an entity will encounter difficulty in meeting obligations associated with financial liabilities that are settled by delivering cash or another financial asset.

c) Market risk: The risk that the fair value or future cash flows of a financial instrument will fluctuate because of changes in market prices. Market risk comprises three types of risk: currency risk, interest rate risk and other price risk.

    i. Currency risk: The risk that the fair value or future cash flows of a financial instrument will fluctuate because of changes in foreign exchange rates.

    ii. Interest rate risk: The risk that the fair value or future cash flows of a financial instrument will fluctuate because of changes in market interest rates.

    iii. Other price risk: The risk that the fair value or future cash flows of a financial instrument will fluctuate because of changes in market prices (other than those arising from interest rate risk or currency risk), whether those changes are caused by factors specific to the individual financial instrument or its issuer, or factors affecting all similar financial instruments traded in the market (IFRS 7.32, Appendix A).

The disclosure requirements are again associated with specific requirements including qualitative and quantitative information. The qualitative information of risks arising from financial instruments should consist of:

a) the exposures to risk and how they arise; and
b) describe the management's objectives, policies and processes for managing risks and the methods used to measure risk
c) any changes in a) or b) above compared to the previous period (IFRS 7.33).

The quantitative information of risks arising from financial instruments should be based on information provided internally to key management. However, certain information regarding currency risk, liquidity risk and market risk are unconditional and have to be provided by the entity, irrespective of whether this information is provided to management or not (IFRS 7.34, BC47).

5.11.2. Offsetting a Financial Asset and a Financial Liability

Financial assets and financial liabilities are principally presented and measured on a sole basis. It would not be appropriate to offset financial assets and liabilities (IAS 1.32, 33).

Financial assets and financial liabilities shall only be offset and the net amount reported in the statement of financial positions if an entity met both of the following conditions:

a) the entity has currently a legally enforceable right to set off the recognized amounts; and

b) it intends either to settle on a net basis, or to realize the asset and settle the liability simultaneously (IAS 32.42).

6. Empirical Evidence from European Banking Institutions

"Never waste the opportunity offered by a good crisis."

Niccolò Machiavelli

(Political philosopher and poet;

* 3 May 1469 – † 21 June 1527)

6.1. Introduction

The recent financial crisis has also turned a spotlight on fair value accounting. The crisis that started in the middle of 2007 in the US subprime sector and continued through the end of 2008 resulted in the collapse of numerous commercial and investment banks or bail outs by the government. The failures of these institutions have resulted in a freeze of global credit markets and therefore in a near systemic banking sector collapse. As a result of these outrageous incidents, political authorities, academics as well as banking supervisors and accounting regulators around the world are in dispute about this unexpected outcome of this financial crisis and the use of fair values in financial accounting.

The application of International Financial Reporting Standards became mandatory for companies listed at European securities markets in 2005. This event brought some changes and innovations to the former use of accounting standards, such as fair value accounting. In general, fair value accounting involves reporting financial assets and financial liabilities on the balance sheet at fair value and recognizing changes in fair value as gains and losses in the income statement or the statement of comprehensive income. When market prices are used to determine fair value, fair value accounting is also called mark-to-market accounting. During the times of the crisis, the assertion was made that current financial accounting requirements had contributed to instability in financial markets and led to irrational investment behavior, illiquid financial markets, and the increased occurrence of procyclical effects.

Most conventional economic theories are based on the assumption of rational investors, or at least predominantly rational behavior that underlies most of efficient market theory. The assumption of rational behavior can comprehend the investors' decision using mathematical models relating their choices to fundamental information. Moreover, investors may behave in a non rational manner, due to social, cognitive, and emotional factors. These psychology affects on investors' decision are known as behavioral finance (Baker & Nofsinger, 2010; Shleifer, 2000).

Liquidity problems arise when a financial institutions has insufficient liquid resources to meet their financial commitments. A typical case is e.g. a sudden withdrawal of customer deposits. But also the contraction of liquidity in particular structured product markets and the interbank-market, as happened in 2007, made it seriously difficult for financial institutions to attract liquidity (De Haan et al, 2009, p. 218, 309). The conjunction of dried up markets and increasing fair value losses led to concerns about compliance with external solvency ratios (e.g. minimum regulatory capital requirements). This can force institutions to sell parts of their financial asset to obtain liquidity and to reduce the need for capital adequacy. Such forced disposals will result in a short-run decrease in market prices. The new lower market price leads to a repeated loss on similar assets held and the currently lower selling price may force institutions to sell even more assets to avoid any breach of regulatory constraints. Additional disposals can have a greater impact on the price and further depress prices in the short-term and may trigger a vicious cycle with an increase in the thread of systemic failure (Cifuentes et al, 2005, p. 556-566).

A procyclical effect due to fair value accounting is closely related to the previous described scenario of liquidity problems. The mixed-attributes-model adopted by the IASB has the potential to increase volatility and lead to procyclical aspects. During the life of an asset or liability, recognition at fair value introduces more volatility in earnings and capital than under historical and amortized cost accounting. The backward looking perspective of historical and amortized cost accounting is replaced by a forward looking assessment[101].

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[101] Procyclicality of financial accounting existed prior to the introduction of fair value accounting. If the business cycle and market sentiment change, so will the valuations of assets and liabilities change (in form of impairment or loan loss provisioning). To express it correctly, the backward looking perspective that is accompanied by provisioning at the appropriate time is replaced by the forward looking perspective of fair value accounting.

The effects of behavioral finance are not object of investigation in this study. The effects caused by liquidity problems are only partly recognized to the extent that they have a procyclical effect. The presence of illiquid markets is discussed later in this chapter. The main focus of this study is in fact the procylicality that is caused by fair value accounting.

The purpose of this study is to empirically investigate the procyclicality that emerged through fair value accounting and is devoted to the current debate over the fair value rules. Is fair value accounting only blamed to be a messenger of poor management decisions and ineffective regulation of financial institutions? Or is fair value accounting providing additional procyclicality to the financial system? This might be precarious for financial institutions because fluctuations in the markets could result in further reaching consequences by increasing or decreasing earnings and shareholders' equity (including revaluation reserve) in exceptional ways.

So far, the question regarding the interdependence between fair value accounting and inactive and illiquid markets has already been answered best by the European Union itself. The prompt application of amendments to IAS 39 in late 2008 (*Amendment to IAS 39 for reclassification of financial assets, IASB 2008b)* was to this day a nonrecurring event. In October 2008, the amendment was published by the IASB and almost at the same time it was endorsed by the EU. This behavior showed the urgency for its application. In IASBs justification of Sir David Tweedie, he addressed the "rare circumstances of the current credit crisis, so that the IASB is committed to taking urgent action to ensure that transparency and confidence are restored to financial markets. The IASB has acted quickly to address the concerns raised by EU leaders and others regarding the issue of reclassification. Our response is consistent with the request made by European leaders and finance ministers; it is important that these amendments are permitted for use rapidly and without modification."

This amendment introduced the possibility of reclassification of some financial instruments in limited circumstances, mainly to reclassify non-derivative financial assets measured at fair value out of the fair value through profit and loss and available-for-sale categories into categories at amortized costs. The need for this reclassification option was one of the IASBs replies to the financial crisis, however it became one of the most famous in the recent years. This reclassification option was already permitted under US GAAP and so the IFRS want to reduce this inconsistency and create a "level playing field" with US GAAP regarding the ability to reclassify financial assets (Deloitte, 2008, p. 1).

The primary goal of the present empirical study is to examine the role that fair value financial reporting played in the financial crisis. Possible determinants of procyclicality, measured by the contribution of the respective fair value asset and liability positions to the fair value gains and losses, are investigated. The period to be analyzed includes three phases: the rise, the peak, and the incipient recoveries till 2010. Because financial institutions were at the center of this crisis and are the main users of fair value accounting, they are the major subject of observation. A comprehensive sample of 316 European IFRS-applying financial institutions shows that approximately one third of their financial assets and more than 15 percent of their financial liabilities are measured at fair value within the observation period. These first impressions may achieve appropriate contributions to the profit and loss and equity reserves and indicate that European banks financial statements could be substantially affected by fair value accounting. This extends of fair value assets and liabilities are investigated in the subsequent part.

6.2. Literature Review

The literature published in the area of fair value accounting is manifold. The value relevance of fair value accounting and comparisons with historical book values is related to the recent debate about market pricing of financial instruments (Barth, 1994; Barth et al., 1996; Eccher et al., 1996; Nelson, 1996; Beatty et al, 1996). The discussion is mainly developed on financial institutions in the United States based on U.S. GAAP. With the application of the IFRS in Europe, some authors have expressed critics at the introduction of the IFRS into European legislation, and remarked the inadequacy of replacing historical and amortized cost with fair value. It has been pointed out that the principles of the IFRS are incompatible with the "organisational" function of financial statements (Schön, 2001, p. 76-79; Kleindiek, 2005, p. 22–24). Some critics discussed whether fair value accounting enhances the significance of accounting information in general (Penman, 2007, p. 41; Ronen, 2008, p. 185; Hitz, 2007, p. 323; Landsman, 2006; Barth, 2004, p. 323). Anyhow, there was certain evidence that the application of IFRS and its regulation to fair value accounting brought a further development and was considered necessary (see chapter 4.8 International Financial Accounting Standards in Europe and 4.9 Fair Value Accounting and the literature cited therein).

The outbreak of the financial crisis fueled the fair value discussion. The financial distress confirmed that the adoption of the IFRS affected not only the relevance of accounting infor-mation but also market stability and the financial and asset structures of companies, particular those operating in the financial sector (European Central Bank, 2006b; Banque de

France, 2008; Novoa et al, 2009, p. 7-13). They argue that fair value accounting has contributed to the severity of the 2008 financial crisis. Measurement of financial instruments at fair value amplifies procyclicality because it requires financial institutions in times of declining market prices to decrease the respective financial instruments to artificially low fair values. The fair value of a financial instrument is affected by "external" factors[102] linked to general market behavior, thus it does not reflect the fundamental value of the respective instrument (Allen & Carletti, 2008; Huian, 2010, p. 41; Laux & Leuz, 2009, p. 10, Plantin et al, 2008; Matherat, 2008, p. 60 - 62). This mechanism, if it actually exists, could have contributed to financial crisis on the one side through the interaction between fair value accounting and bank capital regulation, in case that market prices deviate strongly from their fundamental value and do not reflect an actual lowering of a companies' financial instrument (Laux & Leuz, 2009, p. 4, Bardetscher et al, 2010, p. 30). On the other side may such write-downs trigger fire-sales particularly by financial institutions that are close to violating regulatory capital restrictions which further depress market prices. This process may lead to a downward spiral. Further, critics agree that if there are no reliable observable market prices, fair value estimates lack both reliability and decisions usefulness as management judgment influences the determination of the fair value, which is therefore tainted by the managements own objectives (Fiechter & Novotny-Farkas, 2011, p. 2).

As certain financial instruments became illiquid during the financial crisis, the market valuation became doubtful and financial institutions increasingly used model-based valuations that, despite increased disclosure requirements, included valuations based on increased input parameters with corporate data sources from the holder of the financial instrument. Financial institutions made better use of unobservable inputs in their valuations. The increase of unobservable inputs simultaneously increased uncertainty among financial institutions, supervisors, and investors regarding the valuation of financial products under such conditions (International Monetary Fund, 2008, p. 105).

Recently, the number of empirical researchers regarding the financial crisis increased and a higher level of detail allowed studying additional aspects. Additionally, the qualities of fair value information (Input Level 1, Level 2, and Level 3) were considered in the context of market instability (Song et al., 2010; Goh et al., 2009; Kolev, 2010). These papers focus predominantly on the value relevance of fair values based on observable inputs and that fair

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[102] External factors could be accounting-based regulatory capital requirements for banks or bond covenants that are based on accounting figures (Allen & Carletti, 2008). Further could a management focused on short-term accounting earnings lead to a similar effect (Plantin et al, 2008).

values provided reliability even during the peak of the financial crisis. However, the majority of this literature is focused on U.S. banks and it is not clear whether their findings can be transferred to a European setting.

6.3.   Hypotheses Development

The next section concentrates on the prediction from a theory known as hypotheses development. Hypotheses are tentative or proposed explanations for an observation, phenomenon, or scientific problem that can be tested empirically by further investigation (Wagenhofer, 1990, p. 222). Hypotheses are based on previous observations which cannot be explained sufficiently with the available theories. When hypotheses are statistically tested, two contrasting propositions are generally compared, called null hypothesis and alternative hypothesis. The null hypothesis describes an existing theory or a belief, while the alternative hypothesis is based on new information provided by sample data (Smith, 2003, p. 52; Evans, 2013, p. 163).

Basically, the hypothesis is derived from the theoretical foundation presented in the previous chapters. Accounting of financial assets and liabilities is therefore of particular importance for financial institutions. In addition, the hypothesis is also developed by some empirical literature which has been described in the section 6.2. Anyhow, most of the empirical literature was developed on U.S. based financial institutions, while there is no evidence these findings can be applied for European financial institutions without any difficulties. Furthermore, the application of IFRS allows an eligible possibility of comparing financial statements across Europe, which was previously not given.

In order to make the assumption that fair value accounting significantly affected European financial institutions, the portion of financial assets and liabilities measured at fair value has to be significant. An examination of the balance sheet structure is required to precisely describe the role of fair value accounting.

In the first hypothesis, the argument is investigated, whether fair value assets and liabilities have the potential to significantly affect European financial institutions performance. Based on this, the first hypothesis subject to testing is as follows:

Hypothesis 1: The proportions of Fair Value Assets and Liabilities have a significant impact on European banks.
Alternative Hypothesis 1: Proportions of Fair Value Assets and Liabilities have no significant impact on European banks.

When fair value measures in accounting provide more relevant and reliable information to users in financial statements, it is expected that this is reflected during the latest financial crisis. Since the majority of the world's leading financial institutions suffered high losses during the financial crisis, measurement at fair value of financial instruments is particularly blamed to contribute to the crisis (Wallison, 2008 p. 3-7; Whalen, 2008, p. 6-9). As a response to several critiques throughout the financial crisis, the IASB changed the rules for financial instruments called "Reclassification of Financial Assets: Amendments to IAS 39 and IFRS 7" in order to limit the pro-cyclical effects (IMF, 2009). The IASB announced the amendments on 13 October 2008 and two days later, in an accelerated process of endorsement, the amendments were adopted in EU law (EC Regulation 1004/2008). This option allowed financial institutions to avoid reporting of fair value assets at possibly distorted market prices, but also allowed users to manage their earnings by avoiding fair value losses. Not only did the very fast adoption of the amendments into EU law trigger critics throughout the public, academics and politicians, it also indicates certain evidence for a significant impact of fair value accounting.

The second theoretical foundation is that fair value accounting and the resulting gains and losses from fair value financial instruments increased during times of crisis. If that is the case, it would be an indicator that fair value accounting could contribute to a deterioration of the financial crisis and makes the financial system more vulnerable. Given these arguments, the second hypothesis is:

Hypothesis 2: Fair value accounting has an impact on European banks during the peak of financial crisis.
Alternative Hypothesis 2: Fair value accounting has no impact on European banks during the peak of financial crisis.

In a third analysis, the hypothesis development can be more detailed conducted on the basis of different size categories of financial institutions. Depending on their total amounts of financial assets, it is assumed that smaller financial institutions show less evidence towards fair value accounting than larger financial institutions. In general, smaller financial institutions are expected to carry out less business activities in the areas of trading and derivatives, and thus should be less sensitive to changes in fair value. Following this argumentation, smaller financial institutions should face less gains and losses from fair value financial instruments than larger institutions do. Hence, the third hypothesis is:

Hypothesis 3: Smaller financial institutions show less impact from fair value accounting than larger financial institutions.
Alternative Hypothesis 3: Smaller financial institutions show more impact from fair value accounting than larger financial institutions.

Given the fact that analysis is based on the overall size of the financial institutions, the data set is divided in another way. It is assumed that financial institutions with higher proportions of financial instruments measured at fair value should also encounter higher gains and losses from these assets and liabilities. Following this argumentation, this correlation should become visible, especially during the peak of the financial crisis. Financial institutions with large proportions of financial assets at fair value should also face higher gains and losses from the respective fair value instruments than financial institutions with smaller proportions at fair value. The Hypothesis is therefore stated as follows:

Hypothesis 4: Less fair value-oriented financial institutions show less impact from fair value accounting than more fair value-oriented financial institutions.
Alternative Hypothesis 4: Less fair value-oriented financial institutions show no or more impact from fair value accounting than more fair value-oriented financial institutions.

6.4. Foundations of the Empirical Analysis

This chapter describes the methodological approach used to investigate financial instruments measured at fair value. It presents the research design and the variables that are used within the analysis. The chapter also provides additional analyses which are intended to support the main results and strengthen the confidence in the main findings.

6.4.1. Research Design

As presented in chapter five, IAS 39 determines the recognition and measurement of financial instruments. According to the standard, financial assets have to be classified in one of the four measurement categories and financial liabilities into two measurement categories. Derivates and financial assets held for trading are measured mandatorily *at fair value through profit or loss*. *Loans and receivables* and financial instruments *held-to-maturity* are measured at amortized cost and are subject to periodic impairment assessments. Financial assets that are not classified in one of the described categories are subsumed in the *available-for-sale* category. Fair value changes of *available-for-sale* instruments are recognized directly in equity unless the available-for-sale asset is derecognized or impaired. Then, the cumulative gain or loss is reclassified from equity to profit or loss.

The observed European financial institutions are investigated using a qualitative analysis and by performing a regression analysis. It will be investigated whether financial accounting added procyclicality to the financial system. The research design is to analyze the determinants that might have influenced banks' financial gains and losses due to fair value financial assets and liabilities. First, financial institutions are observed by performing a qualitative analysis. This analysis provides an overview of the application of fair value accounting across European financial institutions und allows to draw some first conclusions.

The regression analysis is based on a multivariate linear model. Thereby the yearly fair value gains or losses (either through profit or loss or through equity) are explained by the estimators of the respective balance sheet positions. The model is applied to the overall sample and, in the following chapters, the sample is compared to certain characteristics of the financial institutions. The design of the regression model is presented in more detail in chapter 6.6.2.

6.4.2. Sample Selection and Data Sources

The first step in sampling is to select a representative sample of the population (Evans, 2013, p. 124). The primary source for the sample selection is the Bureau van Dijk Bankscope. Bankscope provides worldwide banking information including an universal financial statements format to compare banks (Version used: Update Version 256.2 / last data update: 02.12.2011). In the first step, all 10,342 western and eastern European banks are selected. 2,661 banks from this Bankscope universe can be identified as IFRS adopters. Next, the universal bank model is used for all banks with known values in the respective balance sheet

items (Appendix A1) for the financial years 2006 till 2010. This identifies 346 banks. The data is checked for quality assurance and added manually from annual reports as needed or, if no data is present, excluded from the sample.[103] In total 30 banks were excluded due to missing or incomplete market data for the periods of interest between 2006 and 2010. Thus, the initial sample comprises 316 banks.

Table 5: Sample Selection

Panel A: Sample selection		
Financial Institutions by BvD Bankscope (in 2006)		30,312
./. Non-European banks	-	19,970
./. Not applying IFRS	-	7,681
European banks applying IFRS		2,661
./. Not providing Data for the respective period year end 2006 till year end 2010	-	2,315
Sample before data collection		346
Manual completation Missing or incomplete market data year end 2006 till year end 2010	-	30
Sample		**316**

Source: compiled by the author

Even if IAS 39 is not an industry specific standard, the analysis was restricted only to banks. Two reasons led to this decision. First, the vast majority of a bank´s balance sheet contains financial instruments and they have the highest portion of financial instruments accounted at fair value. The banking industry therefore is most strongly affected by IAS 39. Furthermore the magnitude for financial instruments in the non-financial industry is rather small

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[103] While collecting data manually from financial statements from corporate websites the exclusion of banking institutions with missing data took place if data is not available online or not published in English, French, German, or Spanish on their websites. These banks are excluded due to practical impediments.

(Christensen and Nikolaev, 2009, p. 16-26). Second, the banking industry has its own capital regulation which is fundamentally different from other industries (even from the insurance industry). An inclusion of non-banking firms in the sample would pose to hindered problems of inhomogeneous accounting incentives.

6.4.3. Descriptive Evidence

The financial institutions are selected from Eastern and Western Europe. In total, 27 countries are included in the sample. Table 6 contains the selected countries and the respective acronyms, which are used in this work.

Table 6: List of Countries and Acronyms

1	Austria	AT	10	France	FR	19	Latvia	LV
2	Belgium	BE	11	Great Britain	GB	20	Netherlands	NL
3	Bulgaria	BG	12	Greece	GR	21	Poland	PL
4	Switzerland	CH	13	Croatia	HR	22	Portugal	PT
5	Czech Republic	CZ	14	Hungary	HU	23	Romania	RU
6	Germany	DE	15	Ireland	IE	24	Sweden	SE
7	Denmark	DK	16	Island	IS	25	Slovenia	SI
8	Spain	ES	17	Italy	IT	26	Slovakia	SK
9	Finland	FI	18	Luxembourg	LU	27	Turkey	TR

Source: compiled by the author

The following Table 7 presents details on the sample composition by countries. The upper table provides also information on the assets, based on the financial year 2006. The table below shows the liabilities for the same period.

Table 7: Country Specific Breakdown of Total Assets and Total Liabilities

in Tsd EUR

Country code	Frequency	in Percent	Total Assets 2006 by country	in Percent	MEAN Total Assets 2006	MIN Total Assets 2006	MAX Total Assets 2006	STDEV Total Assets 2006
AT	13	4.1	654,240,100	1.7	50,326,162	1,411,900	181,703,200	58,809,364
BE	12	3.8	2,652,225,200	7.1	221,018,767	1,443,000	674,691,000	253,073,013
BG	1	0.3	2,222,324	0.0	2,222,324	2,222,324	2,222,324	-
CH	6	1.9	1,541,728,034	4.1	256,954,672	6,179,867	1,459,962,854	538,104,546
CZ	4	1.3	52,253,302	0.1	13,063,325	891,057	27,726,344	11,871,262
DE	26	8.2	6,219,280,600	16.5	239,203,100	3,106,700	1,571,768,000	319,748,610
DK	1	0.3	367,399,725	1.0	367,399,725	367,399,725	367,399,725	-
ES	53	16.8	2,539,231,200	6.8	47,910,023	354,000	833,872,700	126,217,606
FI	3	0.9	111,882,500	0.3	37,294,167	24,196,000	59,535,000	15,809,333
FR	40	12.7	8,282,366,600	22.0	207,059,165	1,028,600	1,440,343,000	346,412,646
GB	16	5.1	7,073,767,404	18.8	442,110,463	416,451	1,485,306,237	513,345,630
GR	6	1.9	142,856,900	0.4	23,809,483	1,586,500	53,820,000	16,249,279
HR	1	0.3	4,857,511	0.0	4,857,511	4,857,511	4,857,511	-
HU	2	0.6	15,584,214	0.0	7,792,107	7,052,780	8,531,434	739,327
IE	5	1.6	418,493,173	1.1	83,698,635	3,034,073	222,945,000	90,130,341
IS	2	0.6	47,328,200	0.1	23,664,100	4,357,800	42,970,400	19,306,300
IT	51	16.1	2,313,985,600	6.2	45,372,267	51,700	823,284,200	138,516,884
LU	6	1.9	198,531,722	0.5	33,088,620	11,744,900	63,741,100	18,984,772
LV	1	0.3	3,496,888	0.0	3,496,888	3,496,888	3,496,888	-
NL	17	5.4	3,964,968,430	10.6	233,233,437	620,600	1,226,307,000	398,190,214
PL	7	2.2	77,441,504	0.2	11,063,072	5,799,951	17,662,745	4,439,326
PT	16	5.1	363,185,321	1.0	22,699,083	409,821	96,245,800	29,558,148
RU	10	3.2	46,391,680	0.1	4,639,168	122,636	22,340,481	6,477,426
SE	2	0.6	411,976,888	1.1	205,988,444	198,000,275	213,976,613	7,988,169
SI	7	2.2	27,799,057	0.1	3,971,294	525,680	14,411,190	4,395,412
SK	2	0.6	11,475,300	0.0	5,737,650	1,586,600	9,888,700	4,151,050
TR	6	1.9	35,715,287	0.1	5,952,548	36,008	20,873,652	6,969,313
SUM	**316**	**100**	**37,580,684,663**		**118,926,217**	**36,008**	**1,571,768,000**	**270,450,951**

in Tsd EUR

Country code	Frequency	in Percent	Total Liabilities 2006 by country	in Percent	MEAN Total Liabilities 2006	MIN Total Liabilities 2006	MAX Total Liabilities 2006	STDEV Total Liabilities 2006
AT	13	4.1	614,043,100	1.7	47,234,085	1,301,100	169,549,000	54,768,767
BE	12	3.8	2,562,405,100	7.1	213,533,758	1,278,900	657,793,000	246,124,274
BG	1	0.3	1,899,809	0.0	1,899,809	1,899,809	1,899,809	-
CH	6	1.9	1,497,316,179	4.2	249,552,696	5,528,585	1,425,258,308	525,883,278
CZ	4	1.3	48,278,830	0.1	12,069,708	831,756	25,815,618	11,004,214
DE	26	8.2	6,021,697,100	16.8	231,603,735	2,767,100	1,534,028,000	311,455,167
DK	1	0.3	353,097,836	1.0	353,097,836	353,097,836	353,097,836	-
ES	53	16.8	2,359,360,000	6.6	44,516,226	329,000	779,431,400	117,960,237
FI	3	0.9	102,056,100	0.3	34,018,700	22,214,000	53,593,000	13,938,805
FR	40	12.7	7,905,113,400	22.0	197,627,835	916,900	1,385,519,000	332,570,482
GB	16	5.1	6,764,076,080	18.8	422,754,755	186,911	1,444,904,240	490,547,291
GR	6	1.9	133,533,000	0.4	22,255,500	1,201,800	50,196,000	15,222,032
HR	1	0.3	4,470,402	0.0	4,470,402	4,470,402	4,470,402	-
HU	2	0.6	14,459,755	0.0	7,229,877	6,597,561	7,862,194	632,317
IE	5	1.6	401,055,206	1.1	80,211,041	2,758,606	219,468,000	87,640,400
IS	2	0.6	41,735,900	0.1	20,867,950	2,863,000	38,872,900	18,004,950
IT	51	16.1	2,137,029,800	6.0	41,902,545	30,200	774,089,600	128,490,758
LU	6	1.9	187,497,840	0.5	31,249,640	10,239,100	61,352,300	18,263,447
LV	1	0.3	3,212,717	0.0	3,212,717	3,212,717	3,212,717	-
NL	17	5.4	3,824,425,570	10.7	224,966,210	549,300	1,184,877,000	385,341,221
PL	7	2.2	68,720,106	0.2	9,817,158	5,254,106	15,342,817	3,902,908
PT	16	5.1	339,402,871	0.9	21,212,679	314,471	91,012,100	27,719,967
RU	10	3.2	38,863,384	0.1	3,886,338	15,650	17,649,195	5,187,491
SE	2	0.6	395,783,635	1.1	197,891,817	190,082,069	205,701,566	7,809,749
SI	7	2.2	25,406,078	0.1	3,629,440	489,274	13,349,029	4,093,511
SK	2	0.6	10,739,600	0.0	5,369,800	1,527,900	9,211,700	3,841,900
TR	6	1.9	31,454,052	0.1	5,242,342	3,010	18,226,559	6,090,429
SUM	**316**	**100**	**35,887,133,450**		**113,566,878**	**3,010**	**1,534,028,000**	**260,143,303**

Source: Bankscope dataset, compiled by the author

Table 7 provides descriptive statistics of the size of European banks by country. Size is measured in total assets or liabilities, whereas total assets or liabilities are calculated from book values as of 31 December 2006. All figures are denoted in thousand Euros except for the frequency and percentages. If necessary, for the conversion of foreign currency amounts were the official rates from Bankscope used[104]. To avoid any effects due to FX conversion, the most significant values in non-Euro countries (i.e. GBP and CHF) are pegged to their end of 2006 value (see also Annex . This table shows the sample composition by country and the proportion per country as well as total assets/liabilities of the banking institutions per 31 December 2006 per country and the respective mean of total assets/ liabilities. The column *Total Assets 2006 by country/ Total Liabilities 2006 by country* is also shown in the proportion per country. The column *Mean Total Assets 2006 by country/ Mean Total Liabilities 2006 by country* reports the arithmetic mean per country. Besides the table also reports *Minimum*, *Maximum* and *Standard deviation* for the sample per country. The full sample comprises 316 IFRS-applying banking institutions from 27 European countries.

Table 8 presents a statistic summary of the observed dataset per year in a condensed form:

Table 8: Summary Statistics of Overall Sample

	Mean	Median	SD	Min*	Max
TotalAss06	118,926,217	14,612,600	270,879,898	36,008	1,571,768,000
TotalLiab06	113,566,878	14,132,050	260,555,902	3,010	1,534,028,000
TotalEqu06	5,359,339	1,120,047	11,427,151	- 586,200	94,904,905
TotalAss07	130,528,083	17,087,150	303,504,841	66,195	1,925,003,000
TotalLiab07	124,677,169	15,721,550	292,075,742	19,788	1,879,343,000
TotalEqu07	5,850,914	1,228,209	12,671,103	12,700	98,954,313
TotalAss08	135,234,712	18,178,550	340,155,746	122,513	2,202,423,000
TotalLiab08	129,962,699	17,370,600	329,839,170	22,134	2,160,780,000
TotalEqu08	5,272,013	1,079,124	11,696,612	- 1,910,000	78,014,000
TotalAss09	127,010,865	17,361,500	299,182,492	70,930	2,057,698,000
TotalLiab09	120,634,577	16,454,650	285,614,089	12,568	1,977,354,000
TotalEqu09	6,376,288	1,234,850	14,444,847	- 250,900	101,693,749
TotalAss10	130,502,632	17,890,500	317,652,222	95,500	1,998,158,000
TotalLiab10	123,641,178	16,645,877	302,406,627	23,216	1,912,529,000
TotalEqu10	6,861,455	1,300,950	16,168,381	14,600	123,046,685

* in exceptional cases, due to high losses from AfS-Financial Instruments, the IFRS equity became negative.

Source: Bankscope dataset, compiled by the author

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[104] Bureau van Dijk Bankscope uses a monthly electronic feed of exchange rates from the International Monetary Fund.

6.5.   Empirical Analyses - Signification of Fair Value Accounting on European Banks

In this first analysis, it is investigated the application of fair value accounting and the extent of fair value financial assets and financial liabilities on European banks balance sheets is examined during the period 2006 till 2010. The proportions of financial assets at fair value are expected to be larger than the financial liabilities at fair value. Besides the derivative section, the other financial liabilities at fair value are expected to be a relative small category. The guidance on classification and measurement of financial instruments under IFRS is based on a mixed attribute model as described in chapter 5. It stipulates that some financial instruments are reported at fair value and others at amortized cost.

The first hypothesis to be tested is:

Hypothesis 1: The proportions of Fair Value Assets and Liabilities have a significant impact on European banks.
Alternative Hypothesis 1: Proportions of Fair Value Assets and Liabilities have no significant impact on European banks.

6.5.1.   Assets measured at Fair Value

At year end 2006 the observed sample of IFRS consolidated financial statements contained a total volume of EUR 37.6 trillion, of which EUR 13.1 trillion were assets measured at fair value. This gives a percentage of 34.9% of total assets at fair value. The financial assets at fair value can be separated between *Trading Securities and at FV through Income, Derivatives* and *Available-for-Sale Securities*. The larger part (EUR 9.0 billion/ 23.9%) is attributable to financial assets classified as *Trading Securities and at FV through Income* and *Derivatives*. The remaining amount of EUR 4.1 billion (11.0%) is classified as *Available-for-sale Securities*.

As a first indication, a large part of the financial assets are measured at fair value and show some evidence that they have a significant impact on the balance sheet of European banks. In average each financial institutions has more than a third of financial instruments measured at fair value. The following Figure 12 provides an overview of the composition of financial assets between the periods 2006 till 2010. A detailed consideration is given in appendix A4 "Total volume of Financial Assets at Fair value by years".

Figure 12: Total Financial Assets (Nominal)

Total Assets (in million EUR)

Legend:
- Assets at amortized cost
- Available for Sale Securities
- Derivatives
- Trading Securities and at FV through Income
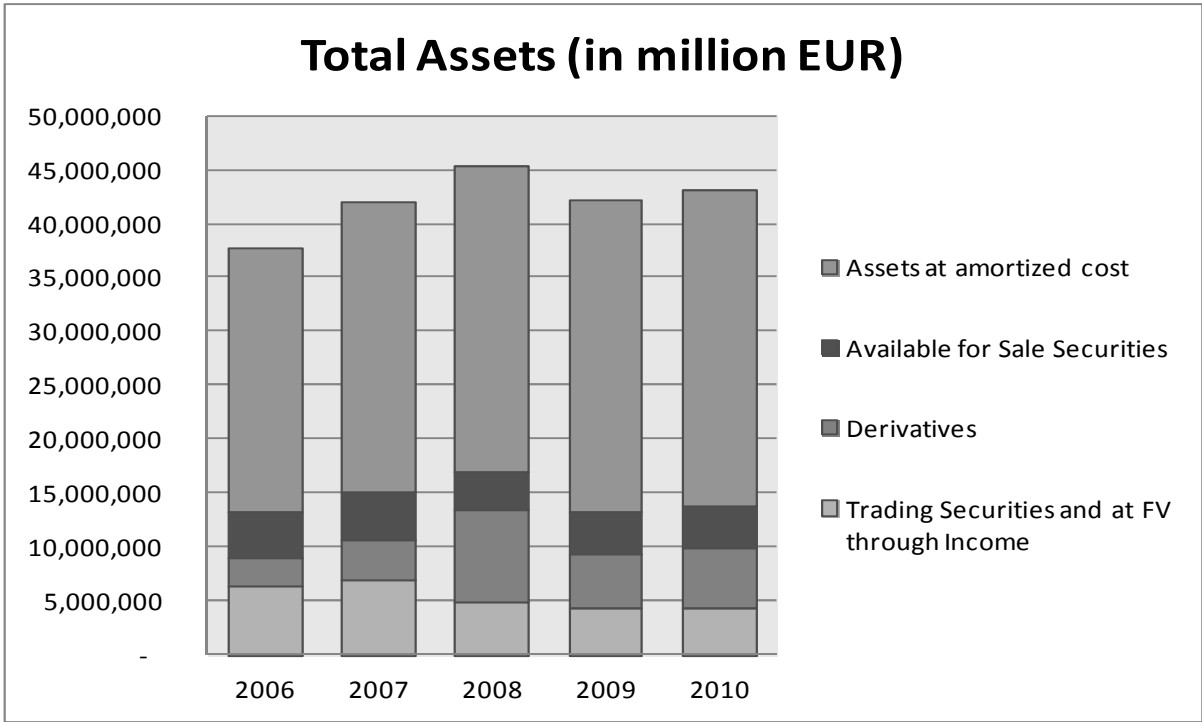
Source: Bankscope dataset, compiled by the author

Figure 12 shows the development of the financial assets of the selected European banking institutions. In 2007 all assets categories grow relative evenly. The total increase of assets amounts to 9.8% compared to 2006. The total assets continue to rise in 2008 but the exceptional circumstances of the financial crisis become apparent. While the *assets at amortized cost* remained at a relative stable level of about EUR 27 trillion, the Fair value categories show significant eruptions. Compared to the previous period the *Trading Securities and at FV through Income* category shrank by 32.9% and the *Available-for-sale Securities* decreased by 22.1% while the *Derivatives* category increased by tremendous 114.4%. In 2009 the overall total assets were decreased by 6.1%. Especially the *Derivatives* category dropped from EUR 7.8 trillion (2008) to EUR 4.8 trillion (2009). The 2010 period shows a slow growth of total assets in all categories under consideration.

Continuing the results regarding the financial assets of the sample, in terms of research design the following graph shows the total financial assets in relative terms.

Figure 13: Total Financial Assets (Relative)
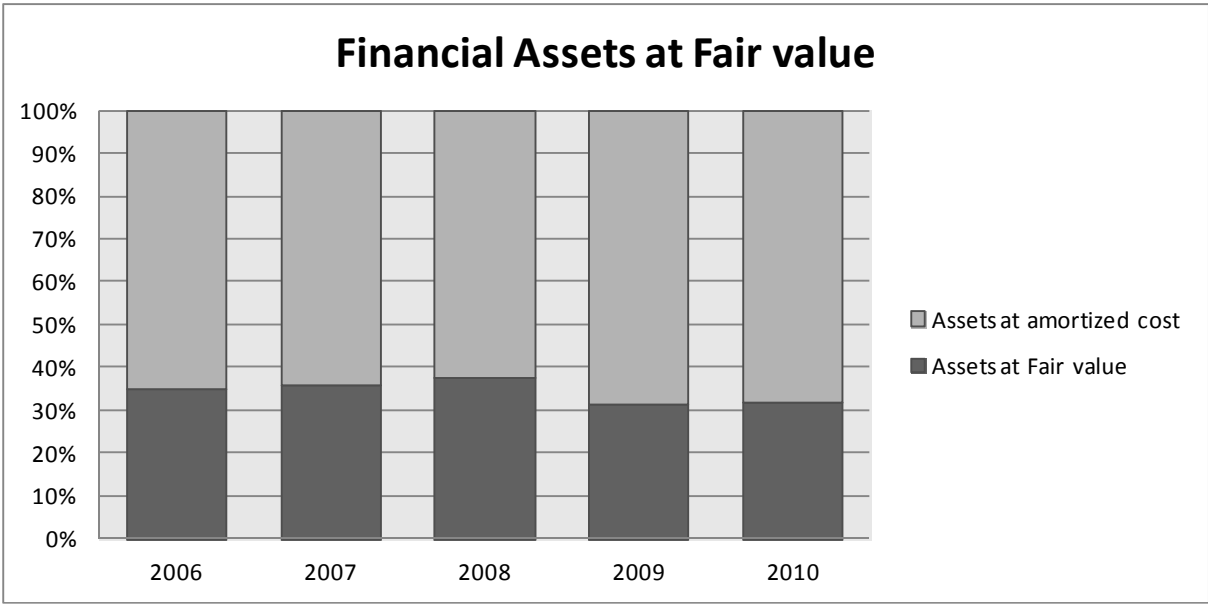
Financial Assets at Fair value

While these outcomes show that the fair value accounting for financial assets has a significant proportion in the financial statements of European banking institutions, it seems important to note that these results should not be generalized. In this context, it may also appear interesting to have a look at the distribution of financial assets at fair value that is given between the individual countries. The following Figure 14 shows the country specific proportion of financial assets at fair value in respect to total assets. Table 9 provides summarizing statistics for the percentages of assets recognized at fair value at the yearend 2006 and 2010.

Figure 14: Country Specific Percentage of Financial Assets at Fair value in 2006 and 2010
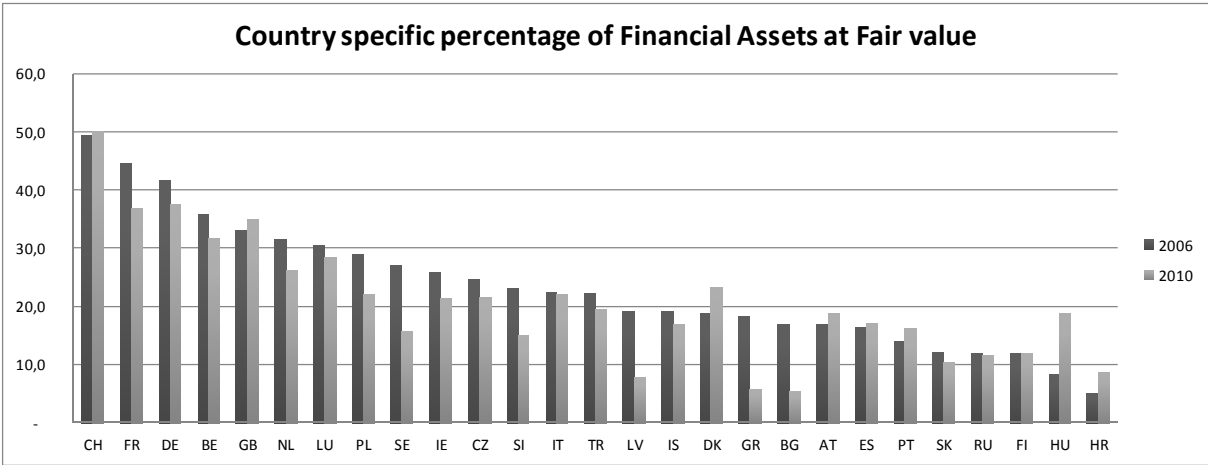
Country specific percentage of Financial Assets at Fair value

Table 9: Country Specific Percentage of Financial Assets at Fair Value in 2006 and 2010

in Tsd EUR

Country code	Frequency	in Percent	Total Assets 2006 by Country	in Percent	Fair Value Assets 2006	in Percent
CH	6	1.9	1,541,728,034	4.1	761,478,252	49.4
FR	40	12.7	8,282,366,600	22.0	3,683,563,000	44.5
DE	26	8.2	6,219,280,600	16.5	2,590,627,500	41.7
BE	12	3.8	2,652,225,200	7.1	950,694,500	35.8
GB	16	5.1	7,073,767,404	18.8	2,331,988,556	33.0
NL	17	5.4	3,964,968,430	10.6	1,248,058,018	31.5
LU	6	1.9	198,531,722	0.5	60,197,133	30.3
PL	7	2.2	77,441,504	0.2	22,375,310	28.9
SE	2	0.6	411,976,888	1.1	110,969,477	26.9
IE	5	1.6	418,493,173	1.1	107,945,257	25.8
CZ	4	1.3	52,253,302	0.1	12,799,999	24.5
SI	7	2.2	27,799,057	0.1	6,383,453	23.0
IT	51	16.1	2,313,985,600	6.2	519,415,200	22.4
TR	6	1.9	35,715,287	0.1	7,940,228	22.2
LV	1	0.3	3,496,888	0.0	669,912	19.2
IS	2	0.6	47,328,200	0.1	9,036,200	19.1
DK	1	0.3	367,399,725	1.0	68,862,611	18.7
GR	6	1.9	142,856,900	0.4	26,029,400	18.2
BG	1	0.3	2,222,324	0.0	373,131	16.8
AT	13	4.1	654,240,100	1.7	109,455,000	16.7
ES	53	16.8	2,539,231,200	6.8	417,196,000	16.4
PT	16	5.1	363,185,321	1.0	50,480,652	13.9
SK	2	0.6	11,475,300	0.0	1,383,800	12.1
RU	10	3.2	46,391,680	0.1	5,489,394	11.8
FI	3	0.9	111,882,500	0.3	13,213,800	11.8
HU	2	0.6	15,584,214	0.0	1,299,856	8.3
HR	1	0.3	4,857,511	0.0	246,911	5.1
SUM	**316**	**100.0**	**37,580,684,663**	**100.0**	**13,118,172,551**	

(table continues on the next page)

in Tsd EUR

Country code	Fre quency	in Percent	Total Assets 2010 by country	in Percent	Fair Value Assets 2010	in Percent
CH	6	1.9	1,534,885,226	4.1	769,926,555	50.2
FR	40	12.7	10,471,532,700	22.0	3,861,287,600	36.9
DE	26	8.2	6,449,424,900	16.5	2,416,585,700	37.5
BE	12	3.8	1,788,042,400	7.1	566,948,700	31.7
GB	16	5.1	7,718,769,511	18.8	2,701,297,884	35.0
NL	17	5.4	3,375,018,700	10.6	877,339,500	26.0
LU	6	1.9	191,545,982	0.5	54,383,611	28.4
PL	7	2.2	105,269,462	0.2	23,045,094	21.9
SE	2	0.6	483,341,985	1.1	75,563,444	15.6
IE	5	1.6	318,508,744	1.1	68,172,889	21.4
CZ	4	1.3	67,670,663	0.1	14,638,218	21.6
SI	7	2.2	36,854,300	0.1	5,523,900	15.0
IT	51	16.1	2,773,176,600	6.2	609,948,900	22.0
TR	6	1.9	62,193,661	0.1	12,003,220	19.3
LV	1	0.3	1,108,052	0.0	84,772	7.7
IS	2	0.6	62,030,419	0.1	10,342,553	16.7
DK	1	0.3	428,495,224	1.0	99,953,589	23.3
GR	6	1.9	223,687,400	0.4	13,079,900	5.8
BG	1	0.3	5,762,802	0.0	308,801	5.4
AT	13	4.1	809,129,600	1.7	151,710,300	18.7
ES	53	16.8	3,571,798,600	6.8	607,402,100	17.0
PT	16	5.1	480,627,463	1.0	77,634,961	16.2
SK	2	0.6	13,652,100	0.0	1,402,800	10.3
RU	10	3.2	90,667,690	0.1	10,565,719	11.7
FI	3	0.9	146,311,000	0.3	17,398,000	11.9
HU	2	0.6	22,286,196	0.0	4,186,151	18.8
HR	1	0.3	7,040,467	0.0	608,714	8.6
SUM	**316**	**100.0**	**41,238,831,846**	**100.0**	**13,051,343,575**	

Source: Bankscope dataset, compiled by the author

Figure 14 illustrates that there is a wide spread between the different countries. Most of the financial institutions with large amounts in column "*total assets 2006 by country*" also show higher proportions of financial assets at fair value than countries with smaller institutions do. At the upper value, Swiss banks reached on average 49.4% of financial assets at fair value, followed by France, Germany, Belgium, and Great Britain. All of these countries have at least more than thirty percent of their total assets valued at fair value. In contrast Croatian banks represent the bottom with only 5.1% (in 2006) and 8.6% (in 2010). As noted above, the average of all banks is 34.9% in 2006 and slightly decreased in 2010 to 31.6%. Figure 14 allows a first inference, that financial institutions from countries with higher percentages at *Fair value Assets 2006* are predominantly the one with higher *Total assets 2006 by country*.

6.5.2. Liabilities measured at Fair Value

The following section provides an overview of the composition of financial liabilities regarding their assessment. Overall the institutions under consideration in 2006 had financial instruments on the liability side in the total amount of EUR 35.9 trillion, of which EUR 5.5 trillion were accounted at fair value. As expected, the proportion of financial instruments measured at fair value is lower compared to the asset side. In total the percentage amounts to 15.2% of financial liabilities at fair value as of 31 December 2006. The total liabilities in between the periods 2006 till 2010 are summarized in the following Figure 15.

Figure 15: Total Financial Liabilities (Nominal)
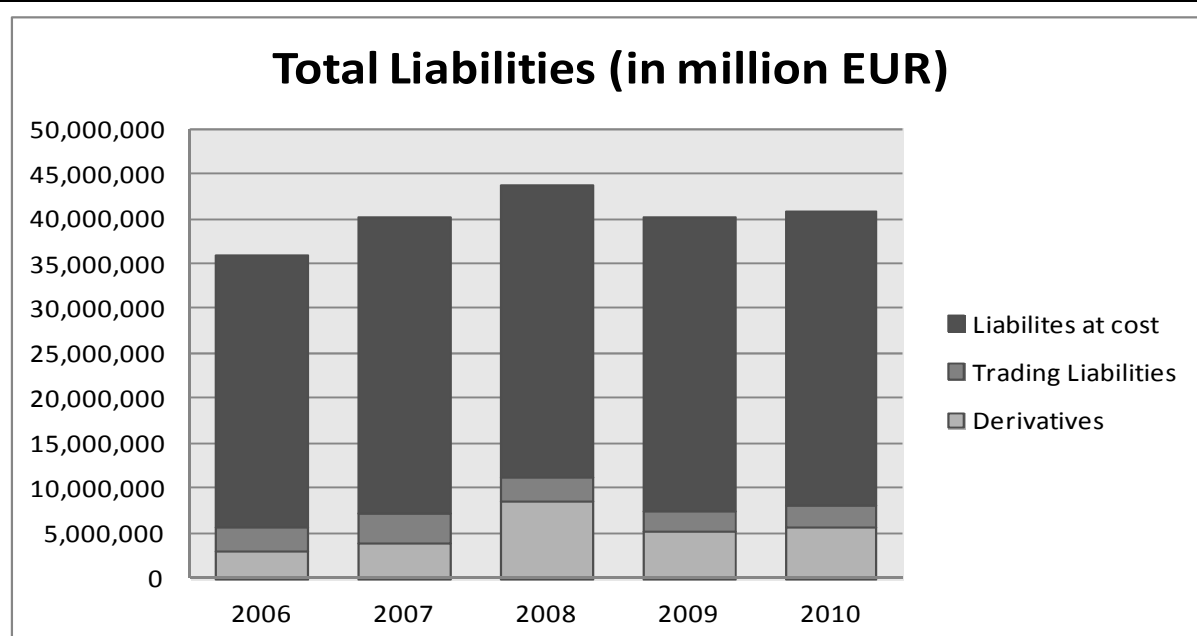
Source: Bankscope dataset, compiled by the author

Analogue to the financial asset side, there is a slight increase in the total liabilities measured at fair value over the years 2006 till 2008. In 2008, the financial liabilities measured at fair value reached their peak value, mainly from the large increase in derivatives (107.9% from 2007 to 2008). Along with the financial asset derivatives, the category plumped down in 2009. The financial liabilities measured at cost remain relatively stable in the five year period. In 2006, the total financial liabilities at cost amounted to EUR 30.4 trillion and remained at a level slightly above EUR 30 trillion in all of the following periods. A more detailed analysis is given in appendix A5 "Total volume of Financial Liabilities at Fair value by years".

The following Figure 16 shows the relative development of the financial liabilities at cost or at fair value.

Figure 16: Total Financial Liabilities (Relative)
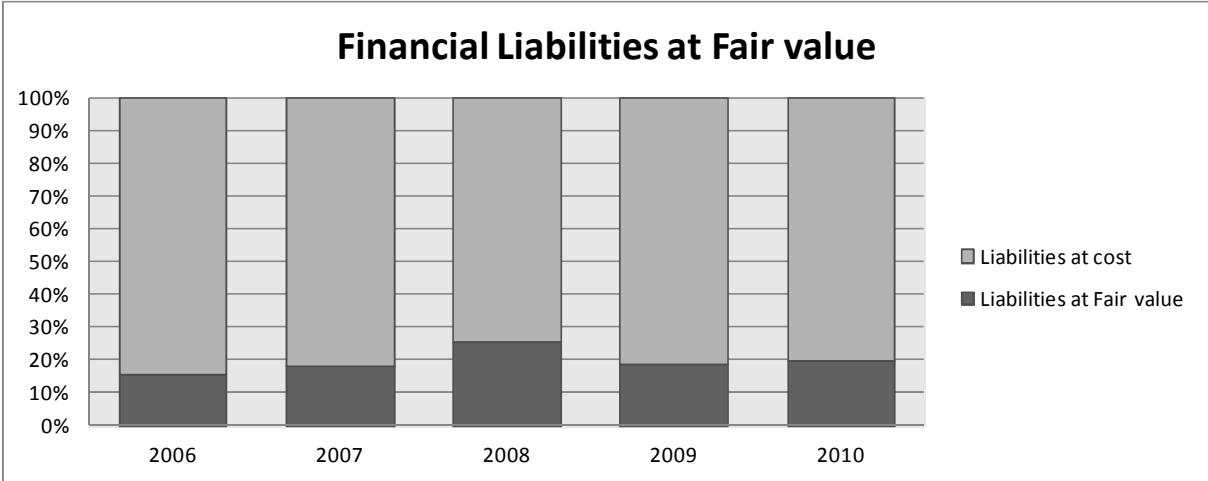
Financial Liabilities at Fair value

In comparison to the financial assets, financial liabilities measured at fair value have a minor impact on the balance sheet. Except for 2008, the financial liabilities measured at fair value comprise less than 20% of total liabilities.

The following Figure 17 presents the distribution of financial liabilities at fair value in between the countries. Table 10 provides summary statistics for the percentages of liabilities recognized at fair value at the yearend 2006 and 2010.

Figure 17: Country Specific Percentage of Financial Liabilities at Fair value in 2006 and 2010

Country specific percentage of Financial Liabilities at Fair value
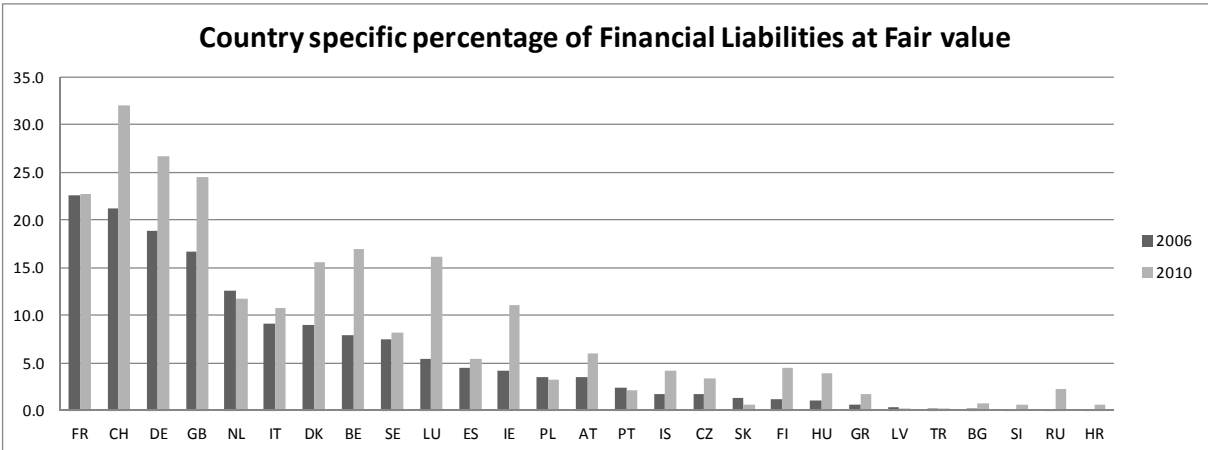
Table 10: Country Specific Percentage of Financial Liabilities at Fair Value in 2006 and 2010

in Tsd EUR

Country code	Frequency	in Percent	Total Liabilities 2006 by country	in Percent	Fair Value Liabilities 2006	in Percent
FR	40	12.7	7,905,113,400	22.0	1,777,085,200	22.5
CH	6	1.9	1,497,316,179	4.2	317,461,124	21.2
DE	26	8.2	6,021,697,100	16.8	1,137,022,000	18.9
GB	16	5.1	6,764,076,080	18.8	1,127,271,834	16.7
NL	17	5.4	3,824,425,570	10.7	481,012,992	12.6
IT	51	16.1	2,137,029,800	6.0	196,165,000	9.2
DK	1	0.3	353,097,836	1.0	31,722,308	9.0
BE	12	3.8	2,562,405,100	7.1	200,586,900	7.8
SE	2	0.6	395,783,635	1.1	29,776,232	7.5
LU	6	1.9	187,497,840	0.5	10,172,399	5.4
ES	53	16.8	2,359,360,000	6.6	104,492,600	4.4
IE	5	1.6	401,055,206	1.1	16,743,346	4.2
PL	7	2.2	68,720,106	0.2	2,450,918	3.6
AT	13	4.1	614,043,100	1.7	21,261,400	3.5
PT	16	5.1	339,402,871	0.9	8,304,039	2.4
IS	2	0.6	41,735,900	0.1	722,000	1.7
CZ	4	1.3	48,278,830	0.1	811,541	1.7
SK	2	0.6	10,739,600	0.0	139,700	1.3
FI	3	0.9	102,056,100	0.3	1,269,000	1.2
HU	2	0.6	14,459,755	0.0	157,463	1.1
GR	6	1.9	133,533,000	0.4	885,100	0.7
LV	1	0.3	3,212,717	0.0	12,041	0.4
TR	6	1.9	31,454,052	0.1	85,349	0.3
BG	1	0.3	1,899,809	0.0	5,062	0.3
SI	7	2.2	25,406,078	0.1	31,105	0.1
RU	10	3.2	38,863,384	0.1	31,063	0.1
HR	1	0.3	4,470,402	0.0	2,722	0.1
SUM	**316**	**100.0**	**35,887,133,450**	**100.0**	**5,465,680,437**	

in Tsd EUR

Country code	Frequency	in Percent	Total Liabilities 2010 by country	in Percent	Fair Value Liabilities 2010	in Percent
FR	40	12.7	9,984,232,000	25.6	2,268,331,100	22.7
CH	6	1.9	1,467,630,312	3.8	468,966,724	32.0
DE	26	8.2	6,212,360,000	15.9	1,656,916,600	26.7
GB	16	5.1	7,322,238,371	18.7	1,789,194,703	24.4
NL	17	5.4	3,206,404,900	8.2	373,897,300	11.7
IT	51	16.1	2,550,985,600	6.5	273,086,700	10.7
DK	1	0.3	408,583,488	1.0	63,781,390	15.6
BE	12	3.8	1,707,433,000	4.4	289,517,800	17.0
SE	2	0.6	459,669,404	1.2	37,752,833	8.2
LU	6	1.9	177,182,683	0.5	28,440,155	16.1
ES	53	16.8	3,308,786,200	8.5	181,300,200	5.5
IE	5	1.6	308,033,381	0.8	33,841,777	11.0
PL	7	2.2	92,528,483	0.2	2,949,061	3.2
AT	13	4.1	742,485,700	1.9	44,433,600	6.0
PT	16	5.1	446,545,122	1.1	9,387,108	2.1
IS	2	0.6	56,432,110	0.1	2,386,869	4.2
CZ	4	1.3	61,609,242	0.2	2,104,376	3.4
SK	2	0.6	12,646,800	0.0	80,800	0.6
FI	3	0.9	133,907,800	0.3	5,983,700	4.5
HU	2	0.6	20,935,152	0.1	822,709	3.9
GR	6	1.9	210,841,400	0.5	3,772,600	1.8
LV	1	0.3	1,056,433	0.0	2,798	0.3
TR	6	1.9	54,299,525	0.1	144,695	0.3
BG	1	0.3	4,851,540	0.0	33,944	0.7
SI	7	2.2	33,551,900	0.1	193,800	0.6
RU	10	3.2	79,170,273	0.2	1,746,665	2.2
HR	1	0.3	6,211,331	0.0	42,740	0.7
SUM	**316**	**100.0**	**39,070,612,151**	**100.0**	**7,539,112,747**	

Source: Bankscope dataset, compiled by the author

As depicted in the graph, some countries had a comparatively high increase in the financial liabilities measured at fair value between 2006 and 2010. Surprisingly countries with relatively high proportions of financial liabilities at fair value already experienced these strong increases in 2007, namely Switzerland, Germany, Great Britain, Denmark, Belgium, Luxembourg and Ireland. The effects in these countries resulted primarily from increases in the derivate category. Subsequently, fair value liabilities reached their peak in 2008. The increase in the derivate section may result from an extensive usage of derivatives as well as from negative effect of derivatives, as negative fair values of derivatives are reported as

financial liabilities at fair value through profit or loss. The effect of an increasing derivative category is also reflected on the asset side, but not so apparent due to the further categories and higher volume of assets at fair value. On the liability side, higher volume of derivatives have a more significant impact which might be seen immediately (for more details of the respective countries, see also Appendix A6 Overview of Selected Countries with High Increases of Financial Liabilities in Relative Terms).

6.5.3. Summary on Signification of Fair Value Accounting on European Banks

The previous two sections presented the potential role of fair value assets and liabilities during the latest financial crisis and analyzed sample characteristics. In addition, this section provides some statistical insights, which are intended to support the findings in the ongoing regression analysis. It is expected, that fair value assets and liabilities cause significant impact on European financial institutions. Therefore, the first hypothesis tested is determined as follows:

Hypothesis 1: The proportions of Fair Value Assets and Liabilities have a significant impact on European banks.
Alternative Hypothesis 1: Proportions of Fair Value Assets and Liabilities have no significant impact on European banks.

As a first indication, the proportions of fair value assets considered in the sample represent relatively constant slightly more than 30% of total assets of the European banks during the observation period. All values ranged between 30.9% (minimum in 2009) and 36.7% (maximum in 2008). The fair value financial liabilities vary between 15.2% (minimum in 2006) and 24.7% (maximum in 2008) of total liabilities.

Fair value accounting seems to be of substantial importance. Nevertheless, a definite conclusion cannot be reached at this early stage. Quantitative variables cannot be defined to what extend certain percentages of financial assets and liabilities become significant or not. However, the proportions are relevant and with respect to the severity of the financial crisis, especially the shift of fair value assets and liabilities in 2008 shows evidence for a certain impact. Fair value assets and liabilities reached their highest proportions in 2008, which is considered as the peak of the crisis. There are certain indications that fair value accounting is more than an accounting valuation technique and, therefore, may have contributed to the accelerated development of the financial crisis. This being said, the first hypothesis should not be rejected.

6.6. Empirical Analysis - Impact of Fair Value Accounting on European Banks during Times of Financial Crisis

After the first observation, there is evidence that fair value accounting has a potential to impact European banks' financial statements. Hence the following analysis seeks to find the origination of the respective fair value gains and losses. The analysis is preceded separately for each year; therefore it can be distinguished between three periods: First, a "normal" period of business without major interruptions (full 2006, and partly 2007, under consideration of the first interruptions due to the financial crisis). The second period reflects the financial tumults of the crisis (partly 2007 and complete 2008). Third, a recovery period that occurred mainly in the years 2009 and 2010. All effects of fair value assets and liabilities are included within a closed time period, based on financial statements year-end data. The respective fair value gains or losses are recognized whether directly in the profit or loss or in the other comprehensive income. The analysis is performed under the consideration, that fair value assets and liabilities show certain evidence during the period of financial crisis. Therefore, the hypothesis to be tested is:

Hypothesis 2: Fair value accounting has an impact on European banks during the peak of financial crisis.
Alternative Hypothesis 2: Fair value accounting has no impact on European banks during the peak of financial crisis.

6.6.1. Descriptive Statistics – Overall Sample

The regression analysis is performed as a multiple analysis that requires certain input data in the form of variables. The variables used are the fair value assets, namely Trading Securities and at Fair Value through Income Statement (*AssTrad*), Derivatives (*AssDeri*), and Available-for-sale Securities (*AssAfS*) and the fair value liabilities, which are composed of Derivatives (LiaDeri) and Trading Liabilities (*LiaTrad*). Net Gains and Losses on Trading and Derivatives and Net Gains and Losses on Assets at Fair Value through Income Statement are included in *PLatFV* and Net Gains and Losses on Available-for-sale Securities and changes in Value of Available-for-sale Investments are combined in *PLAfS*. Both, *PLatFV* and *PLAfS* represent all Gains and Losses due to fair value assets and liabilities within one period (*PLtotal*).

Table 11 provides descriptive statistics for the applied variables in the regression. The table contains mean, median, standard deviation, minimum, and maximum for all 316 financial institutions. A presentation of the model design is offered in the next section.

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Table 11: Descriptive Statistics for the Overall Sample

2006	Mean	Median	SD	Min	Max
AssTrad06	20,212,401	382,700	69,719,836	0	583,391,000
AssDeri06	8,257,961	80,950	33,375,721	0	375,218,000
LiaDeri06	-8,969,015	-83,933	36,020,956	-392,060,000	0
LiaTrad06	-8,327,918	0	34,192,136	-409,446,000	0
AssAfS06	13,042,843	1,191,100	30,656,192	0	170,283,000
PLatFV06	427,009	12,003	1,467,600	-293,100	10,360,000
PLAfS06	147,930	6,400	778,979	-575,000	12,061,000
PLtotal06	574,939	33,250	1,770,919	-344,000	12,993,000

2007	Mean	Median	SD	Min	Max
AssTrad07	21,082,415	393,200	71,496,108	0	694,786,000
AssDeri07	11,289,109	108,450	46,302,821	0	506,967,000
LiaDeri07	-11,751,676	-130,500	47,581,581	-512,436,000	0
LiaTrad07	-10,313,144	-341	42,109,855	-474,976,000	0
AssAfS07	14,002,008	1,400,500	35,111,320	0	275,897,000
PLatFV07	258,761	4,600	1,133,233	-5,204,203	9,065,000
PLAfS07	32,447	0	753,724	-2,830,000	11,210,000
PLtotal07	284,364	6,996	1,348,209	-3,944,189	11,768,000

2008	Mean	Median	SD	Min	Max
AssTrad08	14,143,371	341,813	51,422,009	0	625,351,000
AssDeri08	24,610,056	243,900	109,335,962	0	1,224,493,000
LiaDeri08	-24,425,844	-275,100	106,226,676	-1,181,617,000	0
LiaTrad08	-7,715,115	-3,249	32,693,753	-454,327,000	0
AssAfS08	10,951,679	1,179,150	27,919,391	0	242,852,000
PLatFV08	-269,996	0	1,804,009	-22,647,945	4,236,000
PLAfS08	-534,799	-12,750	1,679,756	-15,277,176	646,000
PLtotal08	-796,789	-26,150	2,641,538	-24,837,061	2,192,000

2009	Mean	Median	SD	Min	Max
AssTrad09	12,508,695	323,200	41,415,875	0	465,079,000
AssDeri09	15,290,601	204,450	59,730,050	0	596,410,000
LiaDeri09	-15,132,005	-185,523	57,760,074	-576,973,000	0
LiaTrad09	-6,702,069	-5,300	24,447,530	-297,353,000	0
AssAfS09	11,445,129	1,469,088	28,722,840	0	221,425,000
PLatFV09	275,778	9,300	1,344,776	-3,551,000	16,233,372
PLAfS09	296,330	15,707	1,405,164	-3,427,000	19,029,000
PLtotal09	539,291	44,200	1,892,128	-1,441,000	15,478,000

(table continues on the next page)

2010	Mean	Median	SD	Min	Max
AssTrad10	13,124,193	258,046	45,738,096	0	485,162,000
AssDeri10	16,577,225	184,450	64,436,393	0	657,780,000
LiaDeri10	-16,594,686	-198,550	62,755,517	-647,171,000	0
LiaTrad10	-7,263,266	-8,350	27,504,588	-328,770,000	0
AssAfS10	11,656,527	1,585,025	29,373,916	0	222,739,392
PLatFV10	262,708	3,666	1,468,942	-4,313,000	14,785,801
PLAfS10	40,922	427	824,225	-2,420,000	11,090,000
PLtotal10	276,478	4,350	1,603,308	-4,786,000	12,279,194

Source: Bankscope dataset, compiled by the author

The table illustrates a relatively fair reflection of the latest financial crisis. In 2006, the banking industry considered in this sample provides in mean profits from fair value financial instruments. This profit arises mainly from the trading and derivative positions (*PLatFV06*). The first indications of the financial crisis started in 2007. The gains from fair value financial instruments decreased and became negative in 2008. The mean gains and losses from fair value financial instruments (*PLTotal*) dropped 3.8 times to negative EUR -796,789 thousand. At the same time, the amounts of derivative assets and liabilities showed huge increases of 118.0% (*AssDeri*) and negative 107.8% (*LiaDeri*). In the years 2009 and 2010, the banks recovered moderately. The mean gains and losses from fair value financial instruments (*PLTotal09*) stated EUR 539,291 thousand at year-end 2009 and derivative assets and liabilities decreased more than a third. The following year confirmed this positive trend and showed no significant differences compared to 2009.

The following Figure 18 provides insights into the distribution of gains and losses from fair value financial instruments.

Figure 18: Histogram of Gains and Losses from Fair Value Financial Instruments
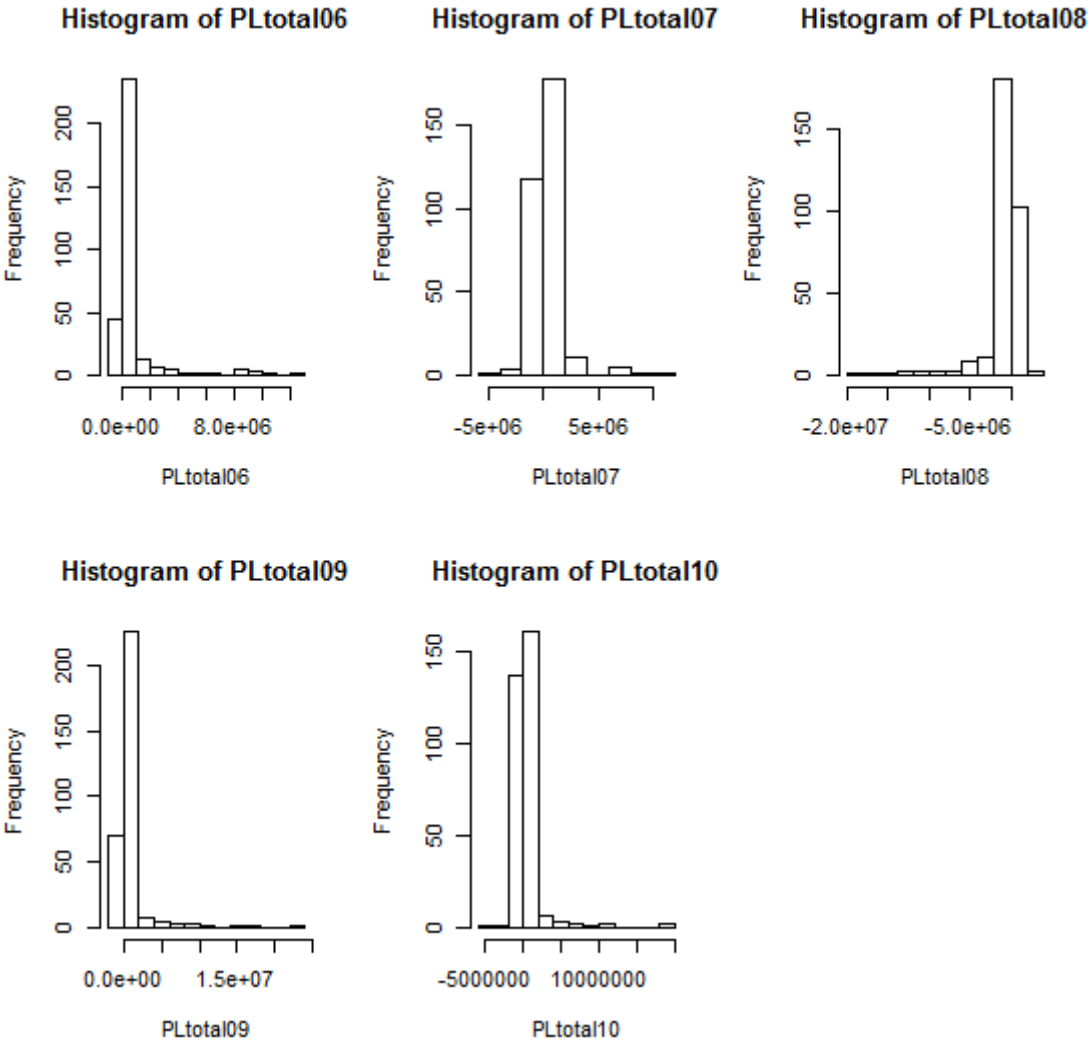
The 2006 gains and losses from fair value assets and liabilities are close to their mean with some positive outliers, representing mainly large financial institutions with their gains in this section. In 2007, the impact of fair value profit and losses slowed down. The mean PLtotal07 shifted from EUR 575 million to EUR 284 million and outliers on the left side, into the loss area, proliferate. This trend continued in 2008 with a mean PLtotal08 of negative EUR 797 million and an increasing number of losses and outliers to the left. In addition, the variation of the overall sample enhanced, the standard deviation increased from EUR 1,348 million (in 2007) to EUR 2,642 million (in 2008). In 2009 and 2010, financial institutions recovered from the tumults of 2008 and the majority of the companies generated profits from fair value assets and liabilities again.

The following table presents a hypothetical rate of return from fair value financial assets and liabilities. The hypothetical rate of return is computed by dividing the mean of total gains and losses of fair value assets and liabilities of an individual period by the sum of the respective mean fair value assets minus fair value liabilities. Thus:

Hypothetical rate of return =

$$PLTotal_i / (AssTrad_i + AssDeri_i + LiaDeri_i + LiaTrad_i + AssAfS_i)$$

Table 12: Hypothetical Rate of Return (Overall Sample)

	2006	2007	2008	2009	2010
Overall sample	2.37%	1.17%	-4.54%	3.10%	1.58%

Source: Bankscope dataset, compiled by the author

In 2006, the hypothetical rate of return of fair value assets and liabilities was 2.37%. In the following year, the financial crisis emerged, resulting also in a decreased rate of return. The trend continued in 2008, where the crisis peaked in a negative return of -4.54%. In 2009, the mean rate of return "recovered" at 3.10% and a moderate return of 1.58% in 2010.

6.6.2. Regression Analysis and Assumptions – Overall Sample

The method of multiple regression analysis is applied to provide evidence on the relation between fair value accounting and the respective gains and losses per period. The empirical analysis in this chapter is conducted on the basis of a multivariate regression analysis using ordinary least squares. The multivariate regression enables to examine observation and analysis of more than one statistical outcome (or independent) variable on one dependent variable. Representing a statistical method, regression analysis provides the opportunity to analyze the composition of fair value assets and liabilities to the extend they contribute to the respective fair value effect in a certain period. The regression coefficients are estimated by using the method of ordinary least squares. This method calculates the regression coefficients so as to minimize the sum of squared residuals for the sample (Studenmund, 2006, p. 36, 41).

Because this study investigates the interdependence between fair value accounting and the financial crisis, it is necessary to perform the regression analysis for each year separately

and subsequently compare the results. To view closed periods, the respective annual data are financial year-end values as of 31 December.

The multiple regression analysis specifies that a dependent variable is a function of more than one independent variable. The dependent variable in the analysis is defined as *FV Effects* which represents all gains and losses resulting from fair value assets and liabilities within a period. According to Bankscope categories, it includes *Net Gains (Losses) on Trading and Derivatives, Net Gains (Losses) on Assets at Fair Value through Income Statement, Net Gains (Losses) on Other Securities (AFS),* and *Change in Value of AFS Investments.* The first three categories are reflected in the profit of the period in the income statement, while the *Change in Value of AFS Investments* is taken from equity. All variables are stated in EUR. This makes standardization obsolete.

The independent variables represent the fair value assets and liabilities which are recognized in the balance sheet. The regression equitation contains five independent variables, as it examines to which extend assets or liabilities have contributed to the respective gains and losses. The independent variables are *Trading Securities and at Fair Value through Income Statement, Derivatives (Assets), Derivatives (Liabilities), Trading Liabilities,* and *Available-for-sale Securities.* The estimated coefficients for these variables describe the relationship between fair value assets and liabilities and the dependent variable.

Additionally to the variation in the dependent variable that is caused by the independent variable, there exists nearly almost variation caused from other sources. This additional variance may arise proportionally from omitted explanatory variables, omitted influences, measurement error, incorrect functional form, or purely random and unpredictable occurrences (Studenmund, 2006, p. 10).

Taken together, the analysis is preceded by using the following regression equitation:

$FV\ Effects_i =$

$$\alpha_0 + \beta_1\ AssTrad_i + \beta_2\ AssDeri_i + \beta_3\ iaDeri_i + \beta_4\ LiaTrad_i + \beta_5\ AssAfS_i + \in$$

The dependent and independent variables are (according to BankScope categories):

FV Effects (PLtotal) =

Net Gains (Losses) on Trading and Derivatives

+ Net Gains (Losses) on Assets at Fair Value through Income Statement

+ Net Gains (Losses) on Other Securities (AFS)

+ Change in Value of AFS Investments. (Direct in Equity)

AssTrad =

Trading Securities and at Fair Value through Income Statement

AssDeri =

Derivatives (Assets)

LiaDeri =

Derivatives (Liabilities)

LiaTrad =

Trading Liabilities

AssAfS =

Available-for-sale Securities

where *i* indicates the number of observations (i = 1,2,….N).

6.6.3. Regression Analysis and Findings – Overall Sample

Table 13 provides the results of the regression model which explains the components of fair value gains and losses. For the observation period 2006 till 2010, the table provides OLS results separately for each year. It provides estimates for the variables, standard errors, t-statistics and significance indicators, respectively. In addition, the R^2 and f-statistics is denoted.

Table 13: Regression Results of the Overall Sample

Call:

lm(formula = PLtotal06 ~ AssTrad06 + AssDeri06 + LiaDeri06 + LiaTrad06 + AssAfS06)

Residuals:

Min	1Q	Median	3Q	Max
-4244424	-66791	-29055	21654	10590003

Coefficients:

	Estimate	Std. Error	t value	Pr(>|t|)	Signif. codes
(Intercept)	28,470.00000	62,510.00000	0.45500	0.64900	
AssTrad06	0.02653	0.00288	9.20400	< 2e-16	***
AssDeri06	0.00800	0.01190	0.67200	0.50200	
LiaDeri06	0.01139	0.01156	0.98500	0.32500	
LiaTrad06	0.01821	0.00395	4.61300	0.00001	***
AssAfS06	0.01518	0.00213	7.11400	0.00000	***

Residual standard error: 1013000 on 310 degrees of freedom

Multiple R-squared: 0.6783,   Adjusted R-squared: 0.6731

F-statistic: 130.7 on 5 and 310 DF, p-value: < 2.2e-16

Residuals:

Min	1Q	Median	3Q	Max
-6576810	-8953	50613	88390	6857292

Coefficients:

		Estimate	Std. Error		t value	Pr(>|t|)	Signif. codes
(Intercept)	-	52,040.00000	56,740.00000	-	0.91700	0.35973	
AssTrad07		0.00192	0.00258		0.74300	0.45803	
AssDeri07		0.03413	0.01366		2.49800	0.01300	*
LiaDeri07		0.03044	0.01338		2.27400	0.02366	*
LiaTrad07	-	0.01155	0.00337	-	3.43100	0.00068	***
AssAfS07		0.01066	0.00172		6.21000	0.00000	***

Residual standard error: 926700 on 310 degrees of freedom

Multiple R-squared: 0.535,   Adjusted R-squared: 0.5275

F-statistic: 71.35 on 5 and 310 DF, p-value: < 2.2e-16

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residuals:

Min	1Q	Median	3Q	Max
-16477624	-3809	108600	194053	10719130

Coefficients:

		Estimate	Std. Error		t value	Pr(>|t|)	Signif. codes
(Intercept)	-	106,200.00000	115,300.00000	-	0.92000	0.35800	
AssTrad08		0.00331	0.00734		0.45100	0.65240	
AssDeri08		0.03138	0.01734		1.80900	0.07140	.
LiaDeri08		0.04615	0.01836		2.51400	0.01240	*
LiaTrad08	-	0.00636	0.00851	-	0.74800	0.45490	
AssAfS08	-	0.03939	0.00461	-	8.54100	0.00000	***

Residual standard error: 1891000 on 310 degrees of freedom

Multiple R-squared: 0.4956,   Adjusted R-squared: 0.4875

F-statistic: 60.93 on 5 and 310 DF, p-value: < 2.2e-16

Residuals:

Min	1Q	Median	3Q	Max
-6755630	-72801	15025	55509	12519235

Coefficients:

		Estimate	Std. Error		t value	Pr(>|t|)		Signif. codes
(Intercept)	-	19,350.00000	74,550.00000	-	0.26000	0.79537		
AssTrad09		0.00477	0.00516		0.92400	0.35612		
AssDeri09		0.06656	0.01729		3.85100	0.00014		***
LiaDeri09		0.06373	0.01840		3.46400	0.00061		***
LiaTrad09	-	0.00015	0.00658	-	0.02300	0.98202		
AssAfS09		0.03885	0.00356		10.92100	< 2e-16		***

Residual standard error: 1225000 on 310 degrees of freedom

Multiple R-squared: 0.5876,   Adjusted R-squared: 0.581

F-statistic: 88.35 on 5 and 310 DF, p-value: < 2.2e-16

Residuals:

Min	1Q	Median	3Q	Max
-6471900	-43148	53351	78907	10786300

Coefficients:

		Estimate	Std. Error		t value	Pr(>|t|)	Signif. codes
(Intercept)	-	62,460.00000	76,690.00000	-	0.81400	0.41598	
AssTrad10		0.02637	0.00512		5.15200	0.00000	***
AssDeri10		0.05038	0.01760		2.86200	0.00449	**
LiaDeri10		0.05411	0.01876		2.88400	0.00420	**
LiaTrad10		0.01868	0.00632		2.95600	0.00336	**
AssAfS10		0.01642	0.00391		4.19800	0.00004	***

Residual standard error: 1255000 on 310 degrees of freedom

Multiple R-squared: 0.397,   Adjusted R-squared: 0.3873

F-statistic: 40.82 on 5 and 310 DF, p-value: < 2.2e-16

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Source: Bankscope dataset, compiled by the author

First of all, the accuracy of the equation is quite good. In the observation period, the regression model provides adjusted R² and F-statistics indicating that this model is relatively reliable.

The results of the 2006 OLS regression show as main contributors to the fair value gains and losses the trading assets and liabilities at fair value and the Available-for-sale assets. The estimated coefficient for AssTrad06 is 0.02653, LiaTrad06 is 0.01821 and AssAfS06 is 0.01518. They are all positive and significant at the *** level. The derivative section provides only little evidence towards the fair value gains and losses. The year 2006 is considered as an ordinary business year without major interruptions due to the financial crisis.

In the following year, the first signs of the financial crisis became visible in the markets, and thus in the financial statements. The 2007 data represents this change, with respect to the derivative section. Derivatives played a major role in the financial crisis because they magnified the exposure and therefore the risk of investors in derivatives and equities of firms holding derivatives (Barth & Landsman, 2010, p. 21). Buckley (2011) points out, that without derivatives, the losses from subprime mortgage investments would be smaller and containable. Some financial institutions might be affected, but not to this extend (Buckley, 2011, p. 85 – 86). The result of the regression model supports these findings. Both estimated coefficients, AssDeri (0.03413) and LiaDeri (0.03044), contribute significantly to the outcome. Furthermore, the estimated coefficient of the Available-for-sale position supports this view, although much weaker than the derivatives (0.01066). In addition, trading liabilities position provides some evidence towards fair value gains and losses, although a negative one (-0.01155).

In 2008, the economy experienced the peak level of the financial crisis. Except for the derivatives, all estimated coefficients contribute negatively to the relationship between the predictor and the outcome. The t-test associates that mainly Available-for-sale assets make a significant contribution at a ***level to the regression model. In comparison to the other 2008 estimated coefficients as well as to previous years AssAfS, the contribution of the Available-for-sale coefficient is pretty intense (AssAfS08 = - 0.03939).

In the next period, AssAfS predictor remains as a significant coefficient (0.03885), and in addition the derivative asset and liabilities became significant at a ***level. The AssDeri09 is 0.06656 and LiaDeri09 is 0.06373. The trading assets and liabilities show only some evidence as a predictor to the OLS model. In 2010, the relationship between the fair value effects and the predictors is positive and significant for nearly all coefficients. Even trading

assets and liabilities contributed to the model. This was not the case in between the years 2008 and 2009.

6.6.4. Summary – Overall Sample

The findings in the regression of the overall sample are associated with fair value accounting and provide evidence for the second hypothesis.

Hypothesis 2: Fair value accounting has an impact on European banks during the peak of financial crisis.
Alternative Hypothesis 2: Fair value accounting has no impact on European banks during the peak of financial crisis.

On the basis of the assumption in this analysis, it is expected that fair value accounting provides some impact on European banks during the peak of the financial crisis. The Available-for-sale assets emerge as a constant predictor throughout the whole period, unchanged contributes at a *** significance level to the model. At the peak of the financial crisis in 2008, the AssAfS become the predominant and only significant coefficient, even negative. In contrast, the trading result of assets and liabilities were significant predictors of fair value gains and losses only in the financial years 2006 and 2010. However, with the outbreak of the financial crisis the trading result became less significant (especially in between the period 2007 and 2009) and the derivative assets and liabilities came to the fore. Large increases in the derivative sections provide certain evidence for fair value effects that might be caused by the financial crisis. Considering all of these circumstances, the second hypothesis should not be rejected. However, these findings provide only preliminary evidence. The results of further regression analysis have to be considered to affirm this conclusion.

6.7. Empirical Analysis – Impact of Fair Value Accounting on European Banks during Times of Financial Crisis – Size Classes according to Total Assets

The comparisons made in section 6.7 show that financial institutions experienced some impact from fair value accounting. The problem with these comparisons is that they only give conclusions about the entire sample. In this section, it is therefore estimated the determinants of fair value gains and losses according to different size classes. The European financial institutions are grouped into different size classes and are crosschecked. To construct prototypical groups of institutions, the classification into groups is based on end of

year 2006 total assets. The regression model from the previous section is extended in order to display the extension. The hypothesis to be tested is:

Hypothesis 3: Smaller financial institutions show less impact from fair value accounting than larger financial institutions.

Alternative Hypothesis 3: Smaller financial institutions show more impact from fair value accounting than larger financial institutions.

6.7.1. Descriptive Statistics – Size Classes according to Total Assets

The overall sample of European financial institutions is split into three homogenous groups. According to the total assets as of 31 December 2006, the sample is divided into small, medium, and large financial institutions. The small group contains all institutions with an amount of total assets up to EUR 10 million. This criterion is fulfilled by 135 banks. The medium size group consists of 93 financial institutions with amounts of total assets in-between EUR 10 million and EUR 50 million. The large subsample includes 88 European financial institutions with total assets larger than EUR 50 million.

The following Table 14 provides summarizing statistics for the three subsamples: small, medium and large financial institutions, divided by the total assets in 2006.

Table 14: Descriptive Statistics of Subsamples (according to Total Assets)

2006

Panal A: small Institutions (according to Total Assets)

	Mean	Median	SD	Min	Max
AssTrad06	277,704	48,282	593,654	0	4,075,850
AssDeri06	48,374	7,201	119,242	0	775,788
LiaDeri06	-56,640	-6,300	156,187	-865,000	0
LiaTrad06	-44,375	0	180,476	-1,497,000	0
AssAfS06	496,284	190,900	750,353	0	4,674,645
PLatFV06	20,747	2,600	75,791	-29,000	729,526
PLAfS06	15,020	900	57,281	-16,800	444,500
PLtotal06	35,767	7,377	94,649	-28,400	737,613

Panal B: medium-sized Institutions (according to Total Assets)

	Mean	Median	SD	Min	Max
AssTrad06	1,308,424	495,000	1,808,848	0	8,138,600
AssDeri06	404,024	137,381	747,983	0	4,284,000
LiaDeri06	-445,363	-113,500	836,336	-4,713,000	0
LiaTrad06	-196,278	0	628,432	-5,019,300	0
AssAfS06	2,512,198	1,960,400	2,353,076	0	9,884,400
PLatFV06	37,335	13,000	70,940	-115,600	348,923
PLAfS06	64,056	18,300	131,292	-351,900	517,000
PLtotal06	101,391	67,125	147,797	-298,500	766,622

Panal C: large Institutions (according to Total Assets)

	Mean	Median	SD	Min	Max
AssTrad06	70,772,107	24,522,950	118,369,468	0	583,391,000
AssDeri06	29,152,396	6,842,500	58,485,015	23,000	375,218,000
LiaDeri06	-31,649,358	-7,763,376	63,054,527	-392,060,000	0
LiaTrad06	-29,629,291	-1,676,100	59,969,708	-409,446,000	0
AssAfS06	43,419,380	28,711,083	45,824,235	297,700	170,283,000
PLatFV06	1,462,068	298,500	2,506,423	-293,100	10,360,000
PLAfS06	440,465	138,300	1,432,582	-575,000	12,061,000
PLtotal06	1,902,533	585,450	2,973,983	-344,000	12,993,000

2007

Panal A: small Institutions (according to Total Assets)

	Mean	Median	SD	Min	Max
AssTrad07	256,961	67,400	480,083	0	2,840,300
AssDeri07	69,091	9,800	170,569	0	1,117,567
LiaDeri07	-88,710	-12,907	218,825	-1,290,106	0
LiaTrad07	-83,295	0	490,385	-5,443,000	0
AssAfS07	573,692	196,896	974,730	0	6,156,065
PLatFV07	9,771	600	45,125	-98,027	326,000
PLAfS07	7,276	136	49,869	-180,400	294,600
PLtotal07	16,942	2,100	66,287	-177,300	307,400

Panal B: medium-sized Institutions (according to Total Assets)

	Mean	Median	SD	Min	Max
AssTrad07	1,501,478	402,600	2,475,251	0	14,644,800
AssDeri07	575,491	142,700	1,066,764	0	5,572,000
LiaDeri07	-683,513	-172,600	1,253,548	-5,675,000	0
LiaTrad07	-387,832	0	1,571,803	-13,826,000	0
AssAfS07	2,842,425	2,187,900	2,434,250	0	10,307,482
PLatFV07	15,094	4,600	96,809	-372,000	514,217
PLAfS07	23,010	0	157,167	-264,000	941,700
PLtotal07	37,869	6,800	170,456	-411,000	938,000

Panal C: large Institutions (according to Total Assets)

	Mean	Median	SD	Min	Max
AssTrad07	73,724,046	28,590,050	120,893,304	0	694,786,000
AssDeri07	39,823,981	9,217,000	81,361,500	109,000	506,967,000
LiaDeri07	-41,340,761	-9,235,000	83,474,114	-512,436,000	-10,100
LiaTrad07	-36,495,914	-4,368,619	73,866,486	-474,976,000	0
AssAfS07	46,395,916	26,386,830	54,603,258	49,847	275,897,000
PLatFV07	898,247	214,821	2,015,786	-5,204,203	9,065,000
PLAfS07	81,033	-13,050	1,422,497	-2,830,000	11,210,000
PLtotal07	955,114	216,300	2,431,609	-3,944,189	11,768,000

2008

Panal A: small Institutions (according to Total Assets)

	Mean	Median	SD	Min	Max
AssTrad08	232,749	49,900	450,909	0	2,870,300
AssDeri08	112,671	20,128	237,742	0	1,603,212
LiaDeri08	-128,976	-29,000	259,504	-1,651,369	0
LiaTrad08	-60,484	0	207,146	-1,325,300	0
AssAfS08	562,367	219,600	912,615	0	6,364,931
PLatFV08	1,755	0	50,220	-213,652	295,800
PLAfS08	-19,593	-1,000	68,930	-498,461	152,700
PLtotal08	-18,081	-2,400	80,398	-443,328	243,800

Panal B: medium-sized Institutions (according to Total Assets)

	Mean	Median	SD	Min	Max
AssTrad08	1,291,131	414,100	2,187,462	0	12,640,000
AssDeri08	830,888	301,800	1,379,780	0	8,642,400
LiaDeri08	-1,002,513	-371,400	1,584,348	-8,940,800	0
LiaTrad08	-391,810	-1,783	1,298,870	-8,736,200	0
AssAfS08	2,409,960	1,771,300	2,299,906	0	12,957,002
PLatFV08	-49,472	200	340,488	-2,776,212	458,520
PLAfS08	-110,002	-36,300	213,377	-1,142,100	436,000
PLtotal08	-159,866	-50,800	413,560	-2,943,741	510,957

Panal C: large Institutions (according to Total Assets)

	Mean	Median	SD	Min	Max
AssTrad08	49,066,011	18,261,500	88,645,868	92,000	625,351,000
AssDeri08	87,321,530	17,012,808	194,338,104	243,000	1,224,493,000
LiaDeri08	-86,453,651	-19,769,469	188,306,362	-1,181,617,000	-174,700
LiaTrad08	-27,197,417	-5,070,827	57,758,679	-454,327,000	0
AssAfS08	35,916,873	17,890,761	44,039,941	331,000	242,852,000
PLatFV08	-919,941	-67,500	3,326,110	-22,647,945	4,236,000
PLAfS08	-1,774,103	-821,900	2,828,832	-15,277,176	646,000
PLtotal08	-2,664,511	-1,171,100	4,491,133	-24,837,061	2,192,000

2009

Panal A: small Institutions (according to Total Assets)

	Mean	Median	SD	Min	Max
AssTrad09	215,350	46,200	391,989	0	2,579,500
AssDeri09	87,220	23,560	177,297	0	1,207,200
LiaDeri09	-85,524	-19,400	175,660	-1,259,300	0
LiaTrad09	-50,195	0	176,293	-1,168,700	0
AssAfS09	698,141	330,700	1,032,455	0	6,879,379
PLatFV09	6,880	2,400	41,572	-175,500	217,420
PLAfS09	-309	2,500	74,123	-564,600	215,752
PLtotal09	6,333	7,949	86,232	-582,300	259,134

Panal B: medium-sized Institutions (according to Total Assets)

	Mean	Median	SD	Min	Max
AssTrad09	1,247,368	321,600	2,297,112	0	10,781,700
AssDeri09	831,116	246,800	1,591,146	0	9,534,800
LiaDeri09	-900,894	-273,000	1,667,358	-10,031,700	0
LiaTrad09	-514,671	-6,771	1,532,601	-10,101,500	0
AssAfS09	2,580,486	2,053,200	2,425,709	0	13,589,418
PLatFV09	55,493	18,800	144,637	-311,400	998,841
PLAfS09	28,224	24,000	152,266	-968,200	362,869
PLtotal09	83,058	62,600	232,486	-1,042,400	1,361,710

Panal C: large Institutions (according to Total Assets)

	Mean	Median	SD	Min	Max
AssTrad09	43,268,980	18,733,369	69,839,242	41,000	465,079,000
AssDeri09	53,895,015	15,180,654	104,043,913	500	596,410,000
LiaDeri09	-53,254,371	-15,170,867	100,192,993	-576,973,000	-86,300
LiaTrad09	-23,445,602	-6,106,549	42,051,588	-297,353,000	0
AssAfS09	37,300,300	18,574,666	45,164,310	146,500	221,425,000
PLatFV09	921,091	304,200	2,436,733	-3,551,000	16,233,372
PLAfS09	1,034,739	270,000	2,520,144	-3,427,000	19,029,000
PLtotal09	1,839,052	628,975	3,243,754	-1,441,000	15,478,000

(table continues on the next page)

2010

Panal A: small Institutions (according to Total Assets)

	Mean	Median	SD	Min	Max
AssTrad10	201,178	40,800	434,477	0	3,112,106
AssDeri10	90,715	21,200	174,726	0	1,225,900
LiaDeri10	-101,582	-22,700	182,032	-1,036,700	0
LiaTrad10	-62,603	0	210,822	-1,278,500	0
AssAfS10	806,149	423,500	1,204,393	0	9,768,564
PLatFV10	2,122	700	40,699	-180,700	281,016
PLAfS10	-5,225	400	92,766	-1,032,000	164,600
PLtotal10	-2,642	1,800	102,889	-1,031,800	362,613

Panal B: medium-sized Institutions (according to Total Assets)

	Mean	Median	SD	Min	Max
AssTrad10	1,279,398	250,100	2,939,481	0	20,199,000
AssDeri10	788,570	282,000	1,676,200	0	11,558,500
LiaDeri10	-870,684	-260,000	1,779,064	-11,612,600	0
LiaTrad10	-595,568	-11,200	2,190,548	-19,193,100	0
AssAfS10	2,758,996	2,051,100	2,403,612	0	9,758,553
PLatFV10	20,723	3,900	91,712	-295,000	447,039
PLAfS10	-14,994	758	164,432	-503,300	1,092,805
PLtotal10	5,590	2,300	219,690	-636,000	1,451,621

Panal C: large Institutions (according to Total Assets)

	Mean	Median	SD	Min	Max
AssTrad10	45,467,066	17,415,500	78,088,117	33,000	485,162,000
AssDeri10	58,554,768	14,519,955	112,069,860	0	657,780,000
LiaDeri10	-58,514,017	-19,136,435	108,590,852	-647,171,000	0
LiaTrad10	-25,356,283	-6,687,000	47,695,043	-328,770,000	0
AssAfS10	37,705,067	19,324,500	46,497,829	110,000	222,739,392
PLatFV10	918,206	132,900	2,683,033	-4,313,000	14,785,801
PLAfS10	170,807	-4,258	1,547,303	-2,420,000	11,090,000
PLtotal10	990,952	147,050	2,919,642	-4,786,000	12,279,194

Source: Bankscope dataset, compiled by the author

Table 14 provides descriptive statistics for the dependent and independent variables for the three samples: the small financial institutions sample, the medium-size institutions, and the subsample of large financial institutions. The table illustrates, that all three panels had to deal with similar effects of the financial crisis, mainly in 2008. Both, trading assets (AssTrad) and the Available-for-sale assets (AssAfS) decreased, while the derivative assets and liabilities decently increased. The profit and loss effects due to fair value assets and liabilities (PLtotal) deteriorated in 2008, and recovered in the following years.

On the other hand, the subsamples differ in several aspects. Looking at the composition of the subsamples, smaller institutions tend to have more fair value assets and liabilities from trading or available-for-sale assets than derivatives. The derivatives exposure is much lower in this panel, in comparison to medium-size or larger financial institutions. One possible reason is probably that smaller institutions rather use derivatives for hedging purposes and do not engage in acting as a provider of derivative contracts. Furthermore, smaller financial institutions' gains and losses from fair value assets and liabilities (PLtotal) vary less. The small sample displays a relative stable standard deviation of the PLtotal throughout the

whole observation period, while the PL total variation of the medium-sized and the large panel almost doubled at the peak of the crisis in 2008.

Table 15 provides an overview of the average rate of return of fair value assets and liabilities for each size class. The calculation method is analogous to chapter 6.6.1.

Table 15: Hypothetical Rate of Return (according to Total Assets)

	2006	2007	2008	2009	2010
Small Institutions	4.96%	2.33%	-2.52%	0.73%	-0.28%
Medium-size Institutions	2.83%	0.98%	-5.10%	2.56%	0.17%
Large Institutions	2.32%	1.16%	-4.54%	3.18%	1.71%

Source: Bankscope dataset, compiled by the author

In principle, Table 15 shows a similar scenario for all three panels as observed in the overall sample. The year 2006 can be considered as normal business year without any interruptions due to the financial crisis. In 2007 and 2008 the returns decreased strongly and recovered in the following years. However, in the first three years, the small financial institutions achieve considerable higher returns than the other two size categories. Medium and large financial institutions achieve approximately similar rates of return within the period 2006 till 2008. While after the peak of the financial crisis, medium and large institutions were making higher returns than the smaller financial institutions.

6.7.2. Regression Analysis and Assumptions – Size Categories according to Total Assets

In this chapter, the regression analysis is performed on the basis of different size classes of European financial institutions. The deviation into three groups is based on the amount of Total Assets in the first year of the observation. It is assumed that smaller financial institutions show less impact from fair value accounting than larger financial institutions do. Smaller financial institutions are expected to carry out less business activities with fair value assets and liabilities, mainly in the areas of trading and derivatives, and so should be less sensitive to changes in fair value. Following this argumentation, smaller financial institutions should face less gains and losses from fair value financial instruments than larger institutions.

The multivariate regression analysis applied in this chapter does not essentially differ from the regression analysis performed in the previous section. A dummy variable is included to capture the effects of different size classes. Accordingly, the equation can be stated as follows:

$$FV\ Effects_i =$$

$$\alpha_0 + \beta_1\ AssTrad_i + \beta_2\ AssDeri_i + \beta_3\ LiaDeri_i + \beta_4\ LiaTrad_i + \ \beta_5\ AssAfS_i$$
$$+\ \beta_6\ DumAssets_i + \in$$

where all categories are consistent with the equation at chapter 6.6.2, plus

DumAssets=
  Dummy variable for Size categories (small, medium and large).

6.7.3. Regression Analysis and Findings – Size Categories according to Total Assets

The results of the OLS regression are presented in Table 16. Analogous to section 6.6.3, the regression model is applied for each year separately. The table provides estimators for variables, standard errors, t-statistics and significance indicators. Furthermore, R^2 and f-statistics are denoted.

Table 16: Regression Results of Subsamples (according to Total Assets)

Call:

lm(formula = PLtotal06 ~ AssTrad06 + AssDeri06 + LiaDeri06 + LiaTrad06 + AssAfS06 + DumAssets)

Residuals:

Min	1Q	Median	3Q	Max
-4238005	-69359	-23026	22658	10595210

Coefficients:

	Estimate	Std. Error	t value	Pr(>|t|)	Signif. codes
(Intercept)	21,990.00000	87,440.00000	0.25100	0.80200	
AssTrad06	0.02649	0.00295	8.97500	< 2e-16	***
AssDeri06	0.00799	0.01194	0.66900	0.50400	
LiaDeri06	0.01136	0.01161	0.97900	0.32800	
LiaTrad06	0.01817	0.00401	4.52900	0.00001	***
AssAfS06	0.01509	0.00254	5.94100	0.00000	***
DumAssetsb.medium	12,240.00000	137,000.00000	0.08900	0.92900	
DumAssetsc.large	15,700.00000	179,700.00000	0.08700	0.93000	

Residual standard error: 1016000 on 308 degrees of freedom
Multiple R-squared: 0.6783, Adjusted R-squared: 0.671
F-statistic: 92.76 on 7 and 308 DF, p-value: < 2.2e-16

Residuals:

Min	1Q	Median	3Q	Max
-6687013	-51167	-7628	76435	6530624

Coefficients:

	Estimate	Std. Error	t value	Pr(>|t|)	Signif. codes
(Intercept)	8,282.00000	79,330.00000	0.10400	0.91690	
AssTrad07	0.00301	0.00261	1.15200	0.25020	
AssDeri07	0.03244	0.01361	2.38400	0.01770	*
LiaDeri07	0.02882	0.01333	2.16200	0.03140	*
LiaTrad07	- 0.01048	0.00338	- 3.10200	0.00210	**
AssAfS07	0.01278	0.00194	6.60300	0.00000	***
DumAssetsb.medium	- 14,280.00000	124,300.00000	- 0.11500	0.90860	
DumAssetsc.large	- 350,700.00000	157,700.00000	- 2.22300	0.02690	*

Residual standard error: 921600 on 308 degrees of freedom
Multiple R-squared: 0.5431, Adjusted R-squared: 0.5327
F-statistic: 52.3 on 7 and 308 DF, p-value: < 2.2e-16

Residuals:

Min	1Q	Median	3Q	Max
-16413167	-50901	9502	136370	10627887

Coefficients:

	Estimate	Std. Error	t value	Pr(>|t|)	Signif. codes
(Intercept)	2,913.00000	162,600.00000	0.01800	0.98570	
AssTrad08	0.00368	0.00733	0.50200	0.61620	
AssDeri08	0.02751	0.01747	1.57500	0.11630	
LiaDeri08	0.04185	0.01851	2.26100	0.02440	*
LiaTrad08	- 0.00605	0.00850	- 0.71200	0.47710	
AssAfS08	- 0.03542	0.00517	- 6.85000	0.00000	***
DumAssetsb.medium	- 65,440.00000	254,700.00000	- 0.25700	0.79740	
DumAssetsc.large	- 524,400.00000	316,100.00000	- 1.65900	0.09820	.

Residual standard error: 1888000 on 308 degrees of freedom
Multiple R-squared: 0.5003, Adjusted R-squared: 0.4889
F-statistic: 44.05 on 7 and 308 DF, p-value: < 2.2e-16

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(table continues on the next page)

Residuals:					
Min	**1Q**	**Median**	**3Q**	**Max**	
-6748618	-70355	17785	55802	12512225	

Coefficients:					Signif.
	Estimate	**Std. Error**	**t value**	**Pr(>|t|)**	**codes**
(Intercept)	- 22,100.00000	105,800.00000	- 0.20900	0.83462	
AssTrad09	0.00478	0.00518	0.92300	0.35650	
AssDeri09	0.06667	0.01741	3.82900	0.00016	***
LiaDeri09	0.06387	0.01856	3.44100	0.00066	***
LiaTrad09	- 0.00014	0.00660	- 0.02200	0.98254	
AssAfS09	0.03874	0.00387	10.00000	< 2e-16	***
DumAssetsb.medium	1,275.00000	165,700.00000	0.00800	0.99387	
DumAssetsc.large	13,680.00000	203,600.00000	0.06700	0.94647	

Residual standard error: 1229000 on 308 degrees of freedom
Multiple R-squared: 0.5876, Adjusted R-squared: 0.5783
F-statistic: 62.7 on 7 and 308 DF, p-value: < 2.2e-16

Residuals:					
Min	**1Q**	**Median**	**3Q**	**Max**	
-6352656	-48334	15949	57034	10869340	

Coefficients:					Signif.
	Estimate	**Std. Error**	**t value**	**Pr(>|t|)**	**codes**
(Intercept)	- 20,250.00000	108,300.00000	- 0.18700	0.85178	
AssTrad10	0.02589	0.00516	5.01600	0.00000	***
AssDeri10	0.04889	0.01773	2.75700	0.00617	**
LiaDeri10	0.05215	0.01895	2.75200	0.00628	**
LiaTrad10	0.01881	0.00634	2.96800	0.00323	**
AssAfS10	0.01791	0.00431	4.15500	0.00004	***
DumAssetsb.medium	- 38,650.00000	169,600.00000	- 0.22800	0.81990	
DumAssetsc.large	- 175,800.00000	209,100.00000	- 0.84000	0.40130	

Residual standard error: 1258000 on 308 degrees of freedom
Multiple R-squared: 0.3984, Adjusted R-squared: 0.3847
F-statistic: 29.14 on 7 and 308 DF, p-value: < 2.2e-16

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Source: Bankscope dataset, compiled by the author

The R^2, as a measure of how much of the variability in the outcome is accounted for by the predictors, explains quite a large amount of the variation. In 2006, the regression model provides a similar picture to the regression output without the total assets dummy (see chapter 6.6.3). Only small deviations were added by the dummy variable (Adjusted R^2 decreased from 0.6731 to 0,671), however, these can be considered as not significant.

In 2007, the financial crisis emerged and first impacts on the financials can be observed. As the regression model indicates, the asset and liabilities derivatives took precedence. However, larger financial institutions were probably hit more intense by the financial crisis

than smaller or medium-size banks. The dummy for large companies estimates a negative shift to -350,700 and became significant for the model at a 5 percent level. This trend continues in 2008. Here, the estimate of the dummy variable for large financial institutions indicates -524,400, significant at a 5 percent level. The 2009 data set shows the opposite development. Large enterprises recovered slightly better than financial institutions from the small and medium-size panel. Also 2010 data provides no significant evidence for the different size categories.

6.7.4. Summary – Size Classes according to Total Assets

The results should provide answers regarding the relation between fair value accounting and the financial crisis under consideration of different size categories. The third hypothesis to be tested is stated as follows:

Hypothesis 3: Smaller financial institutions show less impact from fair value accounting than larger financial institutions.
Alternative Hypothesis 3: Smaller financial institutions show more impact from fair value accounting than larger financial institutions.

It is expected, that smaller financial institutions are less impacted from fair value accounting. In general, the panel with small financial institutions should have less fair value assets and liabilities and thus should be less affected by fair value assets and liabilities. Furthermore, smaller institutions have the intention to use derivates mainly for the purpose of risk management and are not provider of derivate contracts on capital markets. From the small panel, only 7 out of 135 financial institutions have more than 5% derivative assets of their total assets.

The multivariate regression results for the different size categories showed some impact on larger financial institutions, mainly within the years 2007 and 2008. The fact that the coefficient for the variable *DumAssets* is significantly at a 5% or 10% significance level to the model and the enormous shift of the intercept supports these findings. However, the medium-sized financial institutions showed only some minor effects in comparison to the small institutions.

Based on the findings of the OLS model, the third hypothesis should be rejected, because there is only some evidence for an association between the size of the financial institution and the gains and losses from fair value assets and liabilities. In comparison to the small

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panel, certain effects became not significant for the medium panel and showed only some significance for larger financial institutions panel. However, larger institutions are expected to achieve larger profits and losses due to their firm size. This conclusion is based on a measure for the company size and not on the proportion of fair value assets and liabilities. Therefore, the following empirical analysis will provide further results.

6.8. Empirical Analysis – Evidence of European Banks according to different Proportions of Fair Value

Similar to the hypothesis investigating the fair value effects according to different size classes, it is a matter of interest how the proportions of fair value assets on companies' balance sheets are related to the financial crisis. The preceding analysis is based on the total size of the financial institutions. Thereby it considers different measures for firm size and shows some impact on larger companies during the times of crisis. However, to further investigate the effects of fair value accounting, in this section the overall sample of financial institutions is divided by another manner. The sample is split into three groups, according to their proportions of fair value assets. It is assumed that financial institutions with higher pro-portions of financial instruments measured at fair value should also experience higher fair value effects. Especially during the peak of the financial crisis, their volatility might be increased and larger companies might have proliferated stress in these positions. Following this argumentation, financial institutions with large proportions of financial assets at fair value should also face higher gains and losses from the respective fair value instruments than financial institutions with smaller proportions at fair value.

The Hypothesis is therefore stated as follows:

Hypothesis 4: Less fair value-oriented financial institutions show less impact from fair value accounting than larger fair value-oriented financial institutions.
Alternative Hypothesis 4: Less fair value-oriented financial institutions show no or more impact from fair value accounting than larger fair value-oriented financial institutions.

6.8.1. Descriptive statistics – Size Categories according to Fair Value Assets

The sample of European financial institutions is divided into three groups. According to the proportion of fair value assets to total assets as of 31 December 2006, the sample is divided into small, medium, and large fair value asset institutions. The small group contains all institutions up a maximum of 15% of fair value assets. This criterion is fulfilled by 128 financial institutions. The medium size group consists of all companies within the range of 15% up to 30% of fair value assets. The second panel includes 104 companies. The third panel includes 84 European banks with large proportions of fair value assets greater than 30%.

Table 17 presents the transformation of the Total Asset Panels from the previous chapter in comparison to the Fair Value Asset Panels used in this analysis:

Table 17: Transformation of Panels

	Panel A (small): Fair Value Assets (<15%)	Panel B (medium): Fair Value Assets (15% - 30%)	Panel C (large): Fair Value Assets (>30%)	Total
Panel A (small): Total Assets (< EUR 10 Mil)	62	45	28	135
Panel B (medium): Total Assets (EUR 10 Mil - EUR 50 Mil)	46	30	17	93
Panel C (large): Total Assets (> EUR 50 Mil)	20	29	39	88
Total	128	104	84	316

Source: Bankscope dataset, compiled by the author

The companies in the sample are very different with the respect to their composition. As the table indicates, a small financial institution does not necessarily mean to have only small portions of fair value assets. About 54% of the small total assets panel holds more than 15% of their assets at fair value. On the other hand, approximately 44% of the large financial institutions are included in the large fair value assets panel and thus hold more than 30% of their assets at fair value.

Table 18 provides descriptive statistics for the three subsamples: small, medium and large financial institutions, divided by the proportion of fair value assets at year-end 2006.

Table 18: Descriptive Statistics of Subsamples (according to Fair Value Assets)

2006

Panal A: small Institutions (according to Fair Value Assets)

	Mean	Median	SD	Min	Max
AssTrad06	2,583,154	104,800	11,655,547	0	103,498,629
AssDeri06	519,207	40,300	1,671,096	0	12,495,017
LiaDeri06	-505,040	-24,400	1,755,087	-13,918,463	0
LiaTrad06	-548,901	0	3,382,792	-33,289,242	0
AssAfS06	2,429,890	467,386	6,794,020	0	67,830,520
PLatFV06	113,270	7,000	839,268	-293,100	9,451,378
PLAfS06	52,651	4,600	129,012	-351,900	636,451
PLtotal06	165,920	20,450	848,555	-322,700	9,440,945

Panal B: medium-sized Institutions (according to Fair Value Assets)

	Mean	Median	SD	Min	Max
AssTrad06	10,745,444	374,550	27,969,155	0	170,938,000
AssDeri06	3,363,140	90,229	8,594,806	0	60,529,000
LiaDeri06	-4,055,112	-82,687	10,026,063	-61,889,500	0
LiaTrad06	-3,761,336	0	15,643,723	-120,683,000	0
AssAfS06	11,912,512	1,680,350	28,366,350	0	170,283,000
PLatFV06	229,430	9,250	981,199	-207,800	9,436,473
PLAfS06	57,990	4,300	213,699	-575,000	1,353,000
PLtotal06	287,420	27,150	1,032,120	-320,600	9,469,265

Panal C: large Institutions (according to Fair Value Assets)

	Mean	Median	SD	Min	Max
AssTrad06	58,797,012	3,147,900	123,170,137	0	583,391,000
AssDeri06	26,110,602	1,296,500	60,718,360	0	375,218,000
LiaDeri06	-27,950,379	-1,574,100	65,493,945	-392,060,000	0
LiaTrad06	-25,835,521	-324,150	60,713,160	-409,446,000	0
AssAfS06	30,614,418	4,808,823	44,830,417	0	169,758,000
PLatFV06	1,149,711	110,008	2,274,297	-115,600	10,360,000
PLAfS06	404,472	13,192	1,459,474	-530,000	12,061,000
PLtotal06	1,554,183	116,863	2,854,208	-344,000	12,993,000

2007

Panal A: small Institutions (according to Fair Value Assets)

	Mean	Median	SD	Min	Max
AssTrad07	2,154,440	100,472	9,100,212	0	72,167,265
AssDeri07	608,184	39,550	2,058,724	0	17,189,744
LiaDeri07	-538,821	-36,550	1,786,087	-15,153,493	0
LiaTrad07	-698,721	0	3,696,120	-29,757,000	0
AssAfS07	2,506,577	576,350	6,554,922	0	64,321,345
PLatFV07	55,629	3,100	359,524	-204,500	3,891,806
PLAfS07	1,433	541	123,721	-703,663	575,200
PLtotal07	54,258	6,600	304,259	-492,578	3,020,273

Panal B: medium-sized Institutions (according to Fair Value Assets)

	Mean	Median	SD	Min	Max
AssTrad07	11,606,973	401,250	28,669,779	0	163,194,000
AssDeri07	4,323,016	133,060	10,990,542	0	66,134,300
LiaDeri07	-5,160,366	-151,776	14,618,991	-118,600,600	0
LiaTrad07	-4,816,412	-50	17,433,039	-134,268,000	0
AssAfS07	13,171,646	2,044,400	32,160,231	0	227,444,000
PLatFV07	111,795	3,050	533,164	-604,000	3,908,006
PLAfS07	-22,372	0	485,228	-2,830,000	2,011,000
PLtotal07	85,818	2,950	717,541	-3,026,000	3,211,000

Panal C: large Institutions (according to Fair Value Assets)

	Mean	Median	SD	Min	Max
AssTrad07	61,656,545	4,329,350	126,182,259	0	694,786,000
AssDeri07	36,189,489	1,853,850	84,356,751	0	506,967,000
LiaDeri07	-36,998,599	-1,820,500	86,190,505	-512,436,000	0
LiaTrad07	-31,769,173	-410,750	75,401,591	-474,976,000	0
AssAfS07	32,546,922	4,892,100	52,694,939	0	275,897,000
PLatFV07	750,255	35,600	1,997,028	-5,204,203	9,065,000
PLAfS07	147,577	-2,120	1,349,733	-1,693,000	11,210,000
PLtotal07	880,821	25,718	2,372,068	-3,944,189	11,768,000

2008

Panal A: small Institutions (according to Fair Value Assets)

	Mean	Median	SD	Min	Max
AssTrad08	1,167,732	85,150	3,889,397	0	33,278,416
AssDeri08	1,095,012	64,000	4,196,365	0	37,305,293
LiaDeri08	-1,113,796	-93,245	3,613,467	-30,149,518	0
LiaTrad08	-655,954	0	4,188,439	-44,727,000	0
AssAfS08	2,061,194	596,300	4,667,408	0	41,137,953
PLatFV08	-82,397	600	683,645	-6,783,586	697,500
PLAfS08	-93,378	-2,150	311,276	-3,042,800	417,950
PLtotal08	-155,357	-7,500	562,269	-4,364,389	536,000

Panal B: medium-sized Institutions (according to Fair Value Assets)

	Mean	Median	SD	Min	Max
AssTrad08	6,890,780	407,550	17,147,853	0	99,988,000
AssDeri08	8,324,317	265,100	21,914,707	0	129,248,000
LiaDeri08	-7,971,989	-223,405	20,492,540	-129,768,100	0
LiaTrad08	-4,238,319	0	18,067,257	-166,620,000	0
AssAfS08	9,253,622	1,821,800	20,750,046	0	133,365,000
PLatFV08	-144,296	-2,200	843,147	-6,834,541	1,806,800
PLAfS08	-514,075	-14,317	1,382,883	-9,651,000	564,000
PLtotal08	-640,574	-23,700	1,785,768	-10,691,000	2,192,000

Panal C: large Institutions (according to Fair Value Assets)

	Mean	Median	SD	Min	Max
AssTrad08	42,895,171	5,664,700	92,114,431	0	625,351,000
AssDeri08	80,605,801	2,058,250	200,966,715	0	1,224,493,000
LiaDeri08	-80,320,405	-3,008,350	194,794,625	-1,181,617,000	0
LiaTrad08	-22,776,536	-524,400	57,472,584	-454,327,000	0
AssAfS08	26,601,441	3,800,219	44,914,291	0	242,852,000
PLatFV08	-711,490	-9,719	3,237,677	-22,647,945	4,236,000
PLAfS08	-1,233,098	-94,147	2,718,905	-15,277,176	646,000
PLtotal08	-1,967,619	-90,450	4,470,810	-24,837,061	2,102,000

2009

Panal A: small Institutions (according to Fair Value Assets)

	Mean	Median	SD	Min	Max
AssTrad09	1,104,244	73,550	3,648,805	0	26,722,418
AssDeri09	1,136,092	67,943	4,591,387	0	42,438,987
LiaDeri09	-1,086,521	-76,400	3,880,746	-34,412,402	0
LiaTrad09	-664,863	-250	3,351,593	-24,030,456	0
AssAfS09	2,230,836	658,000	4,818,573	0	39,611,875
PLatFV09	153,997	4,000	1,437,429	-472,602	16,233,372
PLAfS09	56,060	4,014	377,494	-968,200	2,656,442
PLtotal09	179,812	14,700	1,341,663	-1,042,400	14,801,352

Panal B: medium-sized Institutions (according to Fair Value Assets)

	Mean	Median	SD	Min	Max
AssTrad09	6,532,210	323,424	15,696,629	0	73,827,500
AssDeri09	5,879,465	214,950	14,501,237	0	88,871,900
LiaDeri09	-5,818,123	-179,301	14,413,396	-89,610,400	0
LiaTrad09	-3,959,097	-700	13,701,198	-109,719,000	0
AssAfS09	9,110,936	2,241,800	18,571,384	0	105,251,000
PLatFV09	167,499	18,250	673,150	-503,000	6,131,927
PLAfS09	221,268	13,350	890,836	-593,000	6,762,000
PLtotal09	372,933	54,600	1,101,199	-601,400	6,674,000

Panal C: large Institutions (according to Fair Value Assets)

	Mean	Median	SD	Min	Max
AssTrad09	37,286,364	6,747,800	72,917,692	0	465,079,000
AssDeri09	48,511,258	1,943,900	108,212,345	0	596,410,000
LiaDeri09	-48,066,121	-1,665,000	104,259,671	-576,973,000	0
LiaTrad09	-19,297,679	-852,233	42,331,639	-297,353,000	0
AssAfS09	28,375,908	4,206,200	47,324,749	528	221,425,000
PLatFV09	595,408	38,550	1,731,610	-3,551,000	7,373,000
PLAfS09	755,389	50,150	2,445,672	-3,427,000	19,029,000
PLtotal09	1,293,036	178,600	2,918,771	-1,441,000	15,478,000

(table continues on the next page)

2010

Panal A: small Institutions (according to Fair Value Assets)

	Mean	Median	SD	Min	Max
AssTrad10	1,000,280	58,600	3,451,855	0	24,225,960
AssDeri10	1,189,445	62,700	4,980,508	0	46,438,958
LiaDeri10	-1,189,053	-80,400	4,328,356	-38,556,307	0
LiaTrad10	-634,512	-700	3,227,894	-24,475,637	0
AssAfS10	2,104,656	781,800	4,625,069	0	39,285,217
PLatFV10	133,784	1,900	1,272,481	-255,400	14,380,648
PLAfS10	9,349	450	277,538	-1,032,000	2,428,668
PLtotal10	117,411	3,319	1,091,918	-1,031,800	11,803,585

Panal B: medium-sized Institutions (according to Fair Value Assets)

	Mean	Median	SD	Min	Max
AssTrad10	7,461,178	283,950	20,698,471	0	142,924,840
AssDeri10	7,541,735	274,550	17,780,355	0	88,376,100
LiaDeri10	-8,091,599	-216,200	18,854,485	-91,179,000	0
LiaTrad10	-3,667,427	-200	10,125,067	-66,285,000	0
AssAfS10	9,491,699	2,415,800	18,331,881	0	99,200,000
PLatFV10	180,887	3,550	1,469,945	-1,243,000	14,785,801
PLAfS10	-45,059	0	457,752	-2,275,000	1,845,000
PLtotal10	103,353	2,000	1,314,177	-3,518,000	12,279,194

Panal C: large Institutions (according to Fair Value Assets)

	Mean	Median	SD	Min	Max
AssTrad10	38,610,076	3,452,553	80,407,099	0	485,162,000
AssDeri10	51,212,066	1,182,000	116,816,176	0	657,780,000
LiaDeri10	-50,597,566	-1,824,850	113,357,138	-647,171,000	0
LiaTrad10	-21,816,216	-1,181,294	49,290,928	-328,770,000	0
AssAfS10	28,892,023	4,974,500	48,760,629	1,189	222,739,392
PLatFV10	560,466	20,350	1,704,839	-4,313,000	8,224,583
PLAfS10	195,485	2,450	1,471,522	-2,420,000	11,090,000
PLtotal10	733,210	26,228	2,345,341	-4,786,000	11,307,000

Source: Bankscope dataset, compiled by the author

Table 18 presents descriptive statistics for the dependent and independent variables used in the regression analysis. The dataset is divided into three panels, according to their proportions of fair value assets at year-end 2006. The table presents for each year separately the mean, median, standard deviation, minimum, and maximum.

In dealing with the impacts of the financial crisis, the table provides a comparable picture to the preceding descriptive statistics of chapter 6.6.1 and 6.7.1. However, the split according to fair value assets explored several findings. As it is expected, the smaller a panel, the smaller are the gains and losses from fair value assets and liabilities (*PLTotal*), since these companies have lower proportions of fair value financial instruments. In 2006 and 2007, the small and medium panel held mainly available-for-sale assets as fair value financial instruments. In direct comparison, the positions trading or derivative financial instruments are rather low within these panels. Financial institutions with large proportion of fair value instruments have no such concentration of individual positions and allow the conclusion that these companies are also actively operating in the areas of trading and the usage and/or issue of derivatives.

In 2008, the effects of the financial crisis intensified and resulted in a decrease of trading assets and massive increases in the derivative positions of all three panels. The mean gains and losses from fair value financial instruments (*PLTotal*) dropped to negative results and the standard deviation roughly doubles. The small panel experienced mean *PLTotal* losses equally from available-for-sale and from trading and derivatives, while the medium and the large panel had increased losses from the available-for-sale financial instruments. In the following year, most of the financial institutions recovered from the severe losses of fair value financial instruments. Mean *PLTotal09* represents sound gains, comparable to the pre-crisis level of 2006. The shift of the *PLTotal* spectrum can also be noticed as the minimum *PLTotal* in 2009 came close to the maximum 2008 in all three panels. In 2010, the relatively stable trend continued and showed no evidence for further variations and irregularities.

Table 19 provides the average rate of return of fair value assets and liabilities for each panel. The calculation method is analogous to chapter 6.6.1.

Table 19: Hypothetical Rate of Return (according to Fair Value Assets)

	2006	2007	2008	2009	2010
Small Institutions	3.70%	1.35%	-6.08%	6.61%	4.75%
Medium-size Institutions	1.58%	0.45%	-5.23%	3.18%	0.81%
Large Institutions	2.52%	1.43%	-4.19%	2.76%	1.58%

Source: Bankscope dataset, compiled by the author

In 2006, small financial institutions achieve slightly higher returns than banks with medium or large proportions of fair value assets. In 2007 and 2008, the rates decreased throughout all panels. At the peak of the crisis in 2008, smaller institutions showed the lowest return rate from fair value financial instruments of negative - 6.08%. This is rather unexpected, as the assumption for smaller institutions is to show less impact of fair value accounting. The following two years, the recovery phase began and within this period the smaller panel shows, in comparison to the larger panels, above average rates of return. This finding is quite interesting and must be kept in mind for the later interpretation of the regression results.

6.8.2. Regression analysis and assumptions – Size Categories according to Fair Value Assets

The regression analysis in this chapter is performed on the basis of different fair value asset classes of European financial institutions. The classification into three groups is based on the

proportion of fair value financial assets at the respective yearend 2006 balance sheet. The assumption for hypothesis testing indicates that financial institutions with smaller proportions of fair value assets are less vulnerable towards fair value accounting than financial institutions with larger proportions. Following this argumentation, financial institutions with small amounts of fair value assets should face less gains and losses from fair value financial instruments than larger institutions.

The basic regression model as presented in chapter 6.6.2 is extended by another dummy variable, or, the dummy variable for total assets in chapter 6.7.2 is replaced by a dummy variable for fair value assets. This dummy variable is included to capture the effects of different proportion of fair value assets for financial institutions.
Thus, the equation is as follows:

$$FV\ Effects_i =$$

$$\alpha_0 + \beta_1\ AssTrad_i + \beta_2\ AssDeri_i + \beta_3\ LiaDeri_i + \beta_4\ LiaTrad_i + \ \beta_5\ AssAfS_i \\ + \ \beta_6\ DumFVAssets_i + \in$$

where all categories are consistent with the equation at chapter 6.6.2, plus

DumFVAssets=

Dummy variable for size categories according to fair value assets (small, medium and large).

6.8.3. Regression Analysis and Findings – Size Categories according to Fair Value Assets

The multivariate regression results for the fair value effects according to different size categories are presented in Table 20. The table depicts the results of OLS regression to explain the components of fair value effects within the observation period 2006 till 2010. The table provides a separate regression model for each year. The estimators for the variables, standard errors, t-statistics and significance indicators are denoted and, in addition, the R^2 and f-statistics are stated.

Table 20: Regression Results of Subsamples (according to Fair Value Assets)

Call:

lm(formula = PLtotal06 ~ AssTrad06 + AssDeri06 + LiaDeri06 + LiaTrad06 + AssAfS06 + DumFVAssets)

Residuals:

Min	1Q	Median	3Q	Max
-4080619	-124668	-59745	86793	10511101

Coefficients:

	Estimate	Std. Error	t value	Pr(>|t|)	Signif. codes
(Intercept)	72,640.00000	89,710.00000	0.81000	0.41900	
AssTrad06	0.02653	0.00288	9.20400	< 2e-16	***
AssDeri06	0.00713	0.01191	0.59800	0.55000	
LiaDeri06	0.01086	0.01156	0.94000	0.34800	
LiaTrad06	0.01837	0.00395	4.65300	0.00000	***
AssAfS06	0.01507	0.00221	6.81600	0.00000	***
DumFVAssetsb.medium	- 160,600.00000	135,100.00000	- 1.18900	0.23500	
DumFVAssetsc.large	52,400.00000	156,200.00000	0.33600	0.73700	

Residual standard error: 1012000 on 308 degrees of freedom
Multiple R-squared: 0.6806, Adjusted R-squared: 0.6734
F-statistic: 93.78 on 7 and 308 DF, p-value: < 2.2e-16

Residuals:

Min	1Q	Median	3Q	Max
-6579438	-30991	26151	127361	6796952

Coefficients:

	Estimate	Std. Error	t value	Pr(>|t|)	Signif. codes
(Intercept)	10,290.00000	82,150.00000	0.12500	0.90043	
AssTrad07	0.00198	0.00259	0.76300	0.44617	
AssDeri07	0.03291	0.01375	2.39500	0.01724	*
LiaDeri07	0.02926	0.01346	2.17500	0.03042	*
LiaTrad07	- 0.01150	0.00337	- 3.40700	0.00074	***
AssAfS07	0.01094	0.00177	6.19600	0.00000	***
DumFVAssetsb.medium	- 138,200.00000	124,200.00000	- 1.11300	0.26669	
DumFVAssetsc.large	- 81,130.00000	142,200.00000	- 0.57000	0.56879	

Residual standard error: 927800 on 308 degrees of freedom
Multiple R-squared: 0.5369, Adjusted R-squared: 0.5264
F-statistic: 51.02 on 7 and 308 DF, p-value: < 2.2e-16

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residuals:

Min	1Q	Median	3Q	Max
-16483175	-38968	89085	225287	10727444

Coefficients:

	Estimate	Std. Error	t value	Pr(>|t|)	Signif. codes
(Intercept)	- 64,500.00000	167,800.00000	- 0.38400	0.70090	
AssTrad08	0.00340	0.00735	0.46300	0.64390	
AssDeri08	0.03278	0.01759	1.86300	0.06340	.
LiaDeri08	0.04772	0.01865	2.55900	0.01100	*
LiaTrad08	- 0.00614	0.00853	- 0.72000	0.47200	
AssAfS08	- 0.03959	0.00477	- 8.30500	0.00000	***
DumFVAssetsb.medium	- 151,600.00000	252,000.00000	- 0.60200	0.54790	
DumFVAssetsc.large	55,120.00000	294,100.00000	0.18700	0.85140	

Residual standard error: 1895000 on 308 degrees of freedom

Multiple R-squared: 0.4966,   Adjusted R-squared: 0.4852

F-statistic: 43.41 on 7 and 308 DF, p-value: < 2.2e-16

Residuals:

Min	1Q	Median	3Q	Max
-7056264	-154850	-62910	102818	20376822

Coefficients:

	Estimate	Std. Error	t value	Pr(>|t|)	Signif. codes
(Intercept)	78,670.00000	108,400.00000	0.72600	0.46857	
AssTrad09	0.00471	0.00516	0.91400	0.36160	
AssDeri09	0.06441	0.01735	3.71300	0.00024	***
LiaDeri09	0.06110	0.01849	3.30500	0.00106	**
LiaTrad09	- 0.00016	0.00657	- 0.02500	0.98025	
AssAfS09	0.03992	0.00363	11.01100	< 2e-16	***
DumFVAssetsb.medium	- 124,000.00000	162,600.00000	- 0.76300	0.44623	
DumFVAssetsc.large	- 284,800.00000	188,800.00000	- 1.50800	0.13249	

Residual standard error: 1224000 on 308 degrees of freedom

Multiple R-squared: 0.5907,   Adjusted R-squared: 0.5814

F-statistic: 63.5 on 7 and 308 DF, p-value: < 2.2e-16

Residuals:

Min	1Q	Median	3Q	Max
-6354768	-94456	-31163	141601	10598072

Coefficients:

	Estimate	Std. Error	t value	Pr(>|t|)	Signif. codes
(Intercept)	69,560.00000	110,900.00000	0.62700	0.53116	
AssTrad10	0.02603	0.00512	5.08900	0.00000	***
AssDeri10	0.04935	0.01760	2.80400	0.00536	**
LiaDeri10	0.05260	0.01876	2.80400	0.00537	**
LiaTrad10	0.01879	0.00631	2.97600	0.00315	**
AssAfS10	0.01786	0.00400	4.46600	0.00001	***
DumFVAssetsb.medium	- 207,600.00000	167,000.00000	- 1.24300	0.21481	
DumFVAssetsc.large	- 313,300.00000	191,900.00000	- 1.63300	0.10350	

Residual standard error: 1253000 on 308 degrees of freedom

Multiple R-squared: 0.4029,   Adjusted R-squared: 0.3893

F-statistic: 29.69 on 7 and 308 DF, p-value: < 2.2e-16

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Source: Bankscope dataset, compiled by the author

The overall regression model provides a similar output for the estimators of the independent variables (see chapter 6.6.3 Regression Analysis and Findings – Overall Sample). Therefore, at this stage the interpretation will not be discussed again. However, the results of the 2006 dataset represent some disparities due to subdivision according to the proportion of fair value assets. The intercept of the small and the large panel is substantially greater than in comparison to the overall sample (2006 Intercept of the overall sample: 28,470). While in 2006 only the medium panel, companies with proportion of 15% till 30% of fair value assets, provides a negative impact of -160,600. The development worsened in all three panels in the following year. While the financial institutions of the small panel achieved slightly positive intercept, the other two panels stayed substantially in the negative range. The estimate for the DumFVAssetsc.large shows a drop to -81,130.

In 2008, the peak of the crisis is also reflected in the regression model. The small panel provides a negative intercept at -64,500, the medium panel adds additional -151,600, while the large panel shows a positive contribution of 55.120 towards the small panel. In the following two years, the intercept of the small panel shows positive estimates (78,670 in 2009 and 69,560 in 2010). The medium panel remains at a relative moderate level. *DumFVAssetsc.large* increasingly becomes negative.

6.8.4. Summary – Size Classes according to Fair Value Assets

The results should provide implications on the association between fair value accounting and the financial crisis under consideration of different panels, which are created according to the companies' proportion of fair value assets. The forth hypothesis to be tested is stated as follows:

Hypothesis 4: Less fair value-oriented financial institutions show less impact of fair value accounting than larger fair value-oriented financial institutions.
Alternative Hypothesis 4: Less fair value-oriented financial institutions show no or more impact of fair value accounting than larger fair value-oriented financial institutions.

It is assumed in this study that financial institutions with smaller proportions of fair value financial instruments suffer less impact from fair value accounting, or on the other hand, banks with larger positions of fair value instruments on their balance sheets should encounter higher negative effects from these assets, especially during the time of financial crisis.

The multivariate regression results for the different fair value categories showed only some evidence for a) the medium panel, as it provides some weak indications as the intercept for the medium panel is less than the small panel in all of the years and b) the larger panel, but significantly only in the aftermath of the financial crisis. In 2006 and 2007, the large sample provides slightly less evidence towards the impact of fair value accounting in comparison to the medium panel. In 2008, the large panel was expected to provide a negative contribution to the estimator. However, the estimator for the large panel provided the most positive outcome for all three panels. Only afterwards, in the years 2009 and 2010, the larger panel showed some weakly significant contribution to the outcome.

Based on the findings of the OLS model, the fourth hypothesis should be rejected, because larger financial institutions provided no significant contribution. This finding is not strong enough to prove any impact of fair value accounting. Only in the years 2009 and 2010, in the aftermath of the financial crisis, there is some weak evidence for an association between the large panel and the gains and losses from fair value assets and liabilities.

6.9.   Limitations of Empirical Analysis

The empirical analysis is not without limitations. The results of the examination may not easily be generalized. While the profit and loss account is always generated over a specific period of time, thus representing a flow of streams, a balance sheet is always related to a specific reporting date. This means for the investigation that inevitably not all positions that are reported in the balance sheet as of 31 of December have contributed to the operating results over the entire period. Or, vice versa, financial assets and liabilities may have contributed only slightly to the operating result, if these have been started to recognize in the balance sheet within a given period. Purchase, sale, or reclassification of financial assets and liabilities may distort the findings.

Secondly, the kind of fair value determinates was not considered. The investigated fair values are the one disclosed in banks' financial statements and are based on mark-to-market valuations as well as mark-to-model valuations. It is expected that a mark-to-model valuation carry a significant degree of subjectivity and potential for discretion.

The limitation just mentioned is influenced by data quality. In addition, particularly the early years of the observation period have to be considered carefully and with some doubts. Fair value accounting was not only a modernized approach; it was in most of the countries newly

introduced. Especially model based valuations including the respective input data require a certain time to be adequately established until they have proofed their reliability.

Further, the in hindsight added option to reclassify certain assets measured at fair value into the amortized cost categories may have distorted the analysis. Financial institutions may primarily have the incentive to reclassify financial instruments that led to actual or imminent fair value losses. In any case, the reclassification induces an embellishment of the financial statements and limited fair value losses from certain financial instruments. The extent of usage of this option is not considered directly.

Additional regression diagnostics are presented in Appendix 7, 8 and 9 and should be taken into consideration while interpreting these results. As expected, some of the applied predictors indicate multicollinearity. The regression model is crosschecked with aggregated predictors and led to a similar outcome as presented above. It shows no evidence of a serious multicollinearity problem.

6.10. Summery Overview of Empirical Analysis

This study investigates whether fair value accounting has significantly contributed to the outcome of the latest financial crisis. In contrast to historical and amortized cost accounting, fair value accounting uses market prices and other market input factors to determine the value of financial assets and liabilities. Critics of fair value accounting argue that by the market valuation of certain financial assets and liabilities the market prices may be distorted and could predominantly lead to three major problems: irrational investors behavior, liquidity problems and an increase in procyclicality. Thereby, this study is to provide evidence of an existence of procyclical effects caused by the application of fair value accounting.

The empirical analysis is performed by a qualitative analysis and a multiple regression analysis. The qualitative analysis is presenting the extent to which fair value accounting is used by European financial institutions and also displays ratios of the sum of all assets and liabilities recognized at fair value to the sum of total assets or liabilities. The results show that the application of fair value accounting is widely-used across Europe, even if the proportions at fair value vary widely between the financial institutions of the member countries. On European average, more than 30% of total assets are recognized and disclosed at fair value in between the observation period. Fair value liabilities vary between 15.2% and 19.3% in the respective periods, except with extraordinary 24.7% in the period 2008.

The proportions of financial assets and liabilities at fair value allow a first conclusion that they are of substantial importance and have a potential to significantly impact European financial institutions. At the peak of the financial crisis in 2008, most of the derivative assets and liabilities rose sharply (proportion of derivative assets rose from 8.8% in 2007 up to 18.2% of total assets; and derivative liabilities from 9.4% up to 18.8%), while the other fair value sections dropped down due to fair value (loss) recognition, disposal of fair value assets, as well as reclassification of fair value financial assets to the amortized cost categories. In the following two years, the derivate assets and liabilities calmed down and remained at relative stable level (derivative assets at about 10%; derivative liabilities at about 13%).

The performed regression analysis indicates several findings. As described in the previous section, the occurrence of the financial crisis led to large increases in the derivative section, while the other fair value categories declined. These findings are examined by the regression analysis. However, fair value asset and liability positions of the overall sample showed only minor indications that fair value gains and losses had significantly contributed to these outcomes.

For further examination of the sample, it is split into two ways: by their overall size of the financial institutions and by their proportions of fair value assets. The first breakdown is performed to prove the evidence that smaller institutions are less prone towards fair value accounting. It is assumed that smaller institutions carry out less business activities in the areas of trading and derivatives. In comparison to larger financial institutions, their most important fair value financial instruments are Available-for-sale assets as well as derivative asset and liabilities. The majority of smaller financial institutions may have the intention to use derivatives for purposes of their own risk management and not to operate as an active provider of derivates. Larger financial institutions may be more interest in the areas of trading and to engage as an active provider of derivative contracts, leading to higher fair value financial instruments that make the institutions more vulnerable towards fair value. The results of the regression analysis only marginally support this argument that larger financial institutions may have been more effected by fair value instruments. Relatively, larger financial institutions are expected to achieve larger gains and losses and the findings allow no specific conclusions on fair value financial instruments.

The second subdivision is performed by financial institutions' proportions of fair value assets. This breakdown varies considerably from the previous breakdown by firm size and aims to have a direct relation to fair value. It is assumed that larger financial institutions faced higher volatility and had proliferated strains with their financial instrument measured at fair value. To

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verify the results, financial institutions with smaller proportions at fair value are expected to experience less fair value effects during the times of the crisis. However, these assumptions are not confirmed by the regression analysis. Financial institutions with medium or large proportions at fair value provided no significant contribution than institutions with small proportions at fair value.

The ongoing financial crisis beard the first challenges to fair value accounting. This study analyses the consequences of applying fair values in financial statements and the interrelation between fair value accounting and procycliality during this crisis. In contrast to the predictions, the empirical analysis showed no or only minor evidence that the recognition and measurement of financial assets and liabilities at fair value added additional procycliality.

The turmoil on the financial markets perceived weaknesses in the application of fair value accounting standards that were fast removed by the reclassification option of the IASB. The relaxation of fair value classification induced short-term benefits, but may imply some long-term costs. The amendment to IAS 39 allowed financial institutions to reclassify certain assets out of the fair value to the amortized cost categories. It was an essential amendment that rescued most troubled banks, at least for the short term. However, it is not clear whether these changes only bridge temporary difficulties caused by accounting principles or whether these amendments hide potential problems and delay a market elimination of non-profitable institutions (Bischof et al, 2010, p. 48). At this point of time, the question cannot be answered definitively.

Nevertheless, the analysis showed no indication that this insufficiency was caused by fair value accounting. It rather allowed the illustration of illiquid markets and aspects of behavioral finance (mainly to a lack of trust in the inter-banking market and certain structured financial products). Fair value accounting seems to be the appropriate direction forward. It provides a possibility that is needed to best reflect the value of certain financial instruments. Nevertheless, fair value accounting makes certain effects of economic activity more transparent on financial institutions' balance sheets. This might result in an increase of volatility of banks' financial statements that makes higher efforts towards risk management necessary and presumes a prudential regulation. However, as long as fair value accounting enhanced the representation of certain financial instruments and thereby reflects economic conditions in an improved manner (even if more volatile), this should not lead to a proceeding against fair value accounting itself.

7. Conclusion

"An extended period of time is an extended period of time,
it is not six months, or 12 months."
Reply when pressed for a time frame for current European monetary policy
Mario Draghi
(President of the European Central Bank;
* 3 September 1947 -)

7.1.   Introduction

This research work presents the causes and consequences of the latest financial crisis and investigates the interdependence between this financial crisis and fair value accounting. Fair value accounting is a matter of growing importance in academic research and in companies' best practice as it became mandatory for capital-market oriented companies in the European Union by the application of the international financial accounting standards (IFRS) in 2005.

The adoption of international accounting standards has changed the focus on financial reporting in Europe. Accounting practice in Europe is traditionally characterized by conservatism and verifiable concepts and requires a complete set of valuation skills and knowledge from the accountants. These local GAAP requirements are supposed to be tax driven, law based, and credit oriented and are predominantly used to fulfill informational needs of various stakeholders (such as tax authorities, owners, creditors, suppliers). The application of IFRS is preceded to fulfill primarily informational needs of investors. Thereby, new concepts and valuation principles find their way into accounting practice. One major innovation was the application of fair value accounting, which means that certain financial instruments are recognized and permanently measured at fair value. Because of these changes part of the accounting standards were removed from typical "accounting" toward incorporating market values and estimating expected future cash flows into financial statements. The fair value concepts provide new qualities towards financial accounting and the relevance for investors shall not be questioned. However, the concept bears some weaknesses and critics are concerned about pure investor orientation. The latest financial crisis

constitutes the first serious challenge towards fair value accounting. There are reasons to believe that fair value accounting may have contributed to the latest financial crisis.

7.2.   Summary and Main Findings

Fair value accounting is of increasing importance in academics and research as well as in accounting practice. The application of international financial reporting standards in 2005 brought some major changes to European IFRS appliers. New concepts and valuation principles were introduced supposed to enhance the reflection of investors' view on individual companies. In the development of these innovations, the IASB had come to the consensus that the value of certain financial instruments is best reflected by its fair value instead of subsequent measurement at historical and amortized costs [105]. In general, fair value accounting involves reporting financial assets and financial liabilities on the balance sheet at fair value and recognizing changes in fair value immediately as gains and losses in the income statement or the statement of comprehensive income.

Proponents of fair value accounting argue that financial instruments measured at fair value reflect best the current market conditions and thereby increase transparency, encourage prompt corrective actions and support investors in the understanding of their risk profile. The introduction of fair value accounting represented a significant innovation towards European IFRS users as fair value accounting was not possible under many local GAAP systems. Most of European local GAAP requirements were based on a historical and amortized cost model. The application of the international standards led to a so called 'mixed model' for the assessment of financial instruments. It contains measurement requirements for certain assets and liabilities at historical and amortized costs as well as measurement principles at fair value. The assessment is based on the typology and the intention of the respective asset or liability.

The accounting of financial instruments at fair value came to the fore in recent years, especially during and after the financial market crisis. The ordinary common accounting discussion among academics and practitioners became a matter of public interest. Critics argued that fair value accounting was to be blamed for the outcome of the financial crisis, or at least, its significant contribution to the market turmoil. They argue that fair value

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[105] Under the historical cost model, assets and liabilities are recorded at their nominal or original monetary value, which usually represents the value when first acquired. In general, these assets and liabilities are not restated for changes in value (only in case of strong impairment need). Under the amortized cost model, assets and liabilities are recorded at their nominal or original monetary value, but are normally depreciated over their estimated lifetime.

accounting leads to irrational investors' behavior and creates an artificial volatility in financial markets and results in a downward spiral of falling prices. Furthermore, fair value accounting has the potential of exacerbating contagion among banks and enhances liquidity problems on financial markets. Last but not least, fair values that are derived from valuation models include inputs other than quoted market prices. If observable market prices are not available, an enterprise has to determine the fair value on its own by applying a valuation model. Thereby it should be taken into account, that these input factors leave certain room for individual adjustments.

Contrary to these critics, it has to be considered that conditions on financial markets have changed over time making an accounting system solely based on historical and amortized costs no longer appropriate. Nowadays, financial instruments are not primarily used for purposes of liquidity management. The following four characteristics provide a broad summery of the latest developments on financial markets. First, larger enterprises have the intention to refinance themselves independently on capital markets by issuing bonds, debt securities or other types of investments; instead of obtaining traditional bank loans. Secondly, the usage of derivatives has multiplied. In general, derivatives are used for risk management purpose to hedge and avoid unexpected situations. However they are also or solely used for speculative reasons. Thirdly, modern capital markets allow enterprises to manage their assets increasingly autonomous. They may temporary sell assets to third parties or securitize parts of their assets and sell them (partly) to external investors. Both of these transactions can be carried out against the background of risk management, refinancing or due to regulatory requirements. Fourthly, enterprises increasingly operate with an active liquidity management. This includes not only the provision of sufficient liquidity at any given point in time as under traditional liquidity management. Furthermore, active liquidity management aims to distribute liquid assets to several types of investments under consideration of profitability and control of the individual risk profile. In summary, the types and usage of financial instruments has largely increased and the presentation of some of these transactions can be rather complex. In addition, some of these financial instruments are subject to temporal value fluctuations (or even offsetting changes in value in the case of derivatives) that require a subsequent measurement at fair value to better reflect the economic circumstances.

At the same time, reporting requirements of IFRS regarding fair value disclosure have been expanded. Both, the application of IFRS 7 *Financial Instruments: Disclosures* and the amendments to IFRS 7 *Improving Disclosures about Financial Instruments* increased the reporting requirements for fair value financial instruments. In addition, the growing

importance of fair value accounting prompted the IASB to release a separate standard. The new standard IFRS 13 *Fair Value Measurement* provides a unique definition for measuring fair value and required disclosures about fair value measurement. IFRS 13 is effective from 1 January 2013 on. It intends to provide a single framework for fair value only, as before the fair value definitions and guidance were given separately in the respective standards leading to some inconsistencies. Nevertheless, the separate standard reflects the increasing importance of fair value accounting.

This study investigated on the role of financial instruments measured at fair value and how these outcomes may have contributing to the financial crisis. Because financial institutions were at the center of the latest crisis, the focus of this analysis is based on banks. Most financial institutions have the incentive to operate profit-driven in modern financial markets. While they do so, they fulfill a traditional and very important economic role within an economy. They act as an intermediate between the supply and demand of capital. On the one hand, financial institutions offer a form of investment for individuals or institutions with a surplus of capital. On the other hand, they provide households and businesses with sufficient liquidity in forms of loans. Liquidity is a prerequisite for a functioning economy and turns financial institutions into important actors on modern capital markets. Governments have a strong interest that financial institutions operate smoothly to match up savers and borrowers. Besides this intermediation between supply and demand of capital, financial institutions provide diverse transaction and intermediate services to their customers. Banking business faces specific risk types, mainly liquidity, credit, and interest rate risk. These risk types indicate typical challenges for financial institutions in normal circumstances, but also make banks more vulnerable during times of crisis.

The analysis is carried out by the inclusion of European financial institutions. Since the 1970s, the development on the European banking market shows a strong trend towards liberalization, deregulation and integration of financial markets in accordance with changes by the European Union and progressive informational technical developments. The European single market reduced barriers and increased competition as well as cross boarder capital flows. But, at the same time, these developments made financial markets more vulnerable to crisis and the regulation of their participants more complicated.

Financial crises are major disruptions in financial systems that cause sharp contraction in economic activity, asset prices and firm failures. Financial crisis have been known as a relatively common phenomenon throughout history. The typical explanation for the recurring occurrence of financial crises is the excessive behavior, frequent monetary excesses, which

lead to a boom including bubble formation and a sudden burst of the dammed. Thereby, financial crises affect countries at all levels of economic development and geographical locations. They often affect a large number of banks and financial institutions and may lead to far-reaching banking crises. Often many banks of a certain region or even - through the increasing effects of globalization various regions simultaneously get involved into a crisis.

Modern capital markets require financial stability, which seems necessary for the smooth function of a financial system without considerable interruptions. Financial system instability, also known as systemic risk, is the risk inherent to the entire market and governments and regulators are constantly concerned to avoid financial crises and reduce systemic risk. Instable financial markets have an adverse effect on the real economy and generally lead to economic recession and to problems to enforce monetary policy. In addition, these systemic effects provide an outlook to the financial impact and costs of financial crises. Governments and regulators are not only concerned with minimizing direct costs of financial crises (like firm failures and lost deposits), moreover they want to avoid the huge impact of indirect costs for the society (like government bailouts, confidence to financial institutions, and further activates to stabilize the economy to avoid a recession). Therefore public authorities take great interest in maintaining financial stability.

However, financial crises have occurred repeatedly. Therefore a number of historical crises are presented in this study, starting with the first modern global crisis in 1929, known as the "Great Depression". This crisis was the first financial crisis suffered by the world capitalist system that affected many areas of the globe simultaneously. It was economically considered one of the most momentous events of the 20th century and the affected countries suffered a massive drop in production, the collapse in world trade and a dramatic rise of unemployment. The crisis, or more specifically, multiple crises in succession, occurred in several stages: a stock market crash, bank panics, worsening of asymmetric information problems, and debt deflation.

The Great Depression was followed by strong regulation of financial markets and protectionism, and through the war years of the Second World War. The post-war period experienced an economic upturn until the late 60s. Most of the industrial countries applied Keynesian economic policies and made strong efforts not to return to pre-war order. Economic and political cooperation was particularly strong in order to prevent the disastrous developments of the thirties and forties. Accompanying, a new financial order was established among the world´s major industrial nations. The Bretton Woods agreement proceeded with the aim to emphasize that all countries would have been better off in a world with free

international trade, macroeconomic and financial stability and international cooperation without sacrificing internal policy goals. An international monetary management system, known as Bretton Woods system, was established to guarantee financial stability. It contained a complete set of rules for commercial and financial relations among the participating countries. One of the major features was that each country had to apply a monetary policy that maintained the exchange rate by tying its currency to the US dollar, which in turn was linked to gold. In case of temporary imbalances of payment, the IMF offered loans to bridge the gap. This system of fixed rates ended in 1973 when the volatility in the prices of commodities, currencies, real estate and stocks increased and the United States removed itself from the gold standard.

With the breakdown of Bretton Woods began a strong trend towards deregulation of financial markets and increasing cross border capital flows. Simultaneously, an increased incidence of financial crises can be observed in the last four decades. Most of these financial crises occurred simultaneously in form of waves, whereby each wave was accompanied by a wave of credit bubbles (mainly in the real estate sector) and followed by a recession. The first wave arose in the early 1980s when Mexico, Brazil, Argentina, and ten other developing countries defaulted on their US-dollar-denominated bank loans. The second wave occurred in the early 1990s. A bubble in real estate and stocks imploded in Japan and three Nordic countries. The third wave began in 1997 and is known as the Asian crisis. Thailand, Malaysia and Indonesia were initially involved, but the turmoil rapidly spread to other economies. The latest wave began in 2007 when the bubble burst in real estate in the United States, Britain, Spain, Ireland, and Iceland. The economic downturn caused by the latest wave, the financial crisis that started in 2007, was the most severe with the strongest global impact since the Great Depression of the 1930s.

Looking at the increased occurrence of financial crises one will note, they have comparable characteristics. An ideal-typical course of a financial crisis in developed economies has the following characteristics: One or more economies are experiencing an economic boom. The economic boom phase is accompanied by a period of low interest and leads to an expansionary lending by financial institutions. At a certain point, the growth of the economy weakens. In this economic environment, a financial crisis may occur under the following conditions: (1) a previous introduction of financial innovation and liberalization of financial markets, followed by a mismanagement of the changing circumstances and conditions, (2) rise of asset prices such as equity shares and real estate above their fundamental economic values, resulting in an expansion of asset-price bubbles followed by its implosion, (3) or a general increase in uncertainty such as after the start of a recession, failure of major financial

institutions or a crash in the stock market that causes an increase in financial frictions which in turn reduce lending and economic activity.

Modern financial systems are relatively unstable, fragile, and prone to crisis. In the onset of such a crisis, financial institutions are facing increases in loan defaults and usually reduce deflation the value of assets and collaterals. If some financial institutions run into solvency problems under such conditions, a contagion effect may rapidly spread through the financial system. Potential bankruptcy can promptly lead to a banking crisis and liquidity problems due to asymmetric information in the markets and strong entanglements between banks. These conditions may lead to a further decline of lending, investment spending and spiraling down the economy. The regulatory dealing with the crisis mainly determines the duration of the crisis. In general, severe approaches with rapid cuts reduce the extent of a crisis. In addition, the crises presented show certain evidence for the "Minsky model", which states that changes in the supply of credit are pro-cyclical, increasing during a boom phase and decreasing when the economy turns slow.

The emergence of the global financial crisis that commenced in the summer 2007 was a great surprise to most people. This crisis also brought the subject of accounting for financial instruments an unusual amount of attention in politics and media. There has been the assumption that current financial accounting principles contributed to the instability in the financial markets and the application of fair value accounting created inappropriate write-downs.

In general, accounting is applied to provide financial information of business activities of an individual enterprise. To achieve comparable, transparent and reliable financial information it is useful to apply common principles and thus to standardize the applied accounting rules. In Europe, the European Commission initiated the objective to harmonize financial accounting information throughout its member states as early as 1978. After nearly thirty years in efforts of an international standardization process, the respective bodies were established and the international financial accounting standards became applicable in 2005. This single set of standards claims to provide high quality, transparent and comparable information in financial statements and other financial reporting to help investors, other participants in the world's capital markets and other users of financial information to make economic decisions.

The international developments and the application of the International Financial Accounting Standards brought several innovations to European companies in relation to their former national accounting requirements. Before the application of IFRS, many European

companies were used to measure their assets and liabilities at historical and amortized cost, according to the respective local GAAP regulation. By the application of international financial accounting standards, two approaches are used to measure assets and liabilities. On the one hand, certain assets and liabilities are measured at historical and amortized costs like before under most European local GAAP systems and on the other hand, the fair value approach was newly introduced for certain financial assets and liabilities. Hence, the introduction of the fair value concept was an important innovation in the area of financial reporting as it was previously not available under most of local GAAPs. In addition, the adoption of IFRS changed the focus of financial accounting. While most local GAAP systems focus on stakeholder interests (i.e. tax authorities, creditors, suppliers), IFRS' primarily aims to fulfill the informational needs of investors.

The desired outcome by applying international financial accounting standards is an illustration of a true and fair view of a company's value. The analysis in this study is based on European financial institutions, whereby the majority of their assets and liabilities are classified as financial instruments. The accounting rules for financial instruments under International Financial Accounting Standards and their respective measurement requirements are one of the main constitutes and as well one of the most discussed sections of the IFRS. The IASBs view of financial assets, financial liabilities, and equity instruments as well as derivatives and embedded derivatives are presented in detail. The relevant standard IAS 39 "*Financial Instruments: Recognition and Measurement"* includes specific guidance for the recognition, subsequent measurement, and derecognition of financial instruments and some special rules for embedded derivatives and hedging instruments. However, the increased use as well as an increase of complexity of certain financial instruments combined with the aim of a presentation as effective as possible makes accounting rules rather complex.

During and after times of the latest financial crisis, the assertion was made that current financial accounting requirements had significantly contributed to instability in financial markets and led to three major effects: irrational investment behavior, illiquid financial markets, and procyclicality. The main focus of this empirical study is to investigate the effects of procyclicality that emerged through fair value accounting. Procyclical effects caused by the application of fair value accounting are closely related to effects caused by liquidity problems and so these are partly recognized to the extent that they have a procyclical effect. The empirical study is focused on financial institutions as they are at the center of capital markets. They are the main appliers of IAS 39 and shall provide empirical evidence on implications of fair value accounting of European financial institutions during times of global

financial crisis. A comprehensive sample of 316 IFRS applying financial institutions was analyzed over the observation period between 2006 and 2010.

Based on the current discussion about fair value accounting, the empirical analysis consists of a qualitative analysis and a multiple regression analysis to investigate any procyclical effects caused by fair value accounting. To examine the research question, several methodological issues needed to be considered as foundation for the empirical study. The qualitative analysis examines the overall scope of fair value accounting and shows that the application of fair value accounting is widely-used across Europe. Thereby, the proportions at fair value vary widely between financial institutions of the member countries. On European average, financial institutions had approximately one-third of their total assets recognized at fair value in between the observation period. Fair value liabilities vary between 15.2% and 19.3% in the respective periods, except with extraordinary 24.7% in 2008.

The proportions of fair value financial assets and liabilities allow to draw some first conclusions on how significant their impact on European financial institutions is. In between the different classes of financial instruments were some significant changes of proportions during the observation period. Especially at the peak of the crisis in 2008, the number of derivative assets and liabilities rose sharply while the number of other fair value classes dropped considerably due to loss of recognition, disposal or reclassification to amortized cost categories.

The performed regression analysis examines the consequences of the application of fair value accounting and the development of these positions during the times of financial crisis. Most of European financial institutions suffered high losses during that period, especially at the peak of the crisis in 2008. If accounting at fair value adds procyclicality, it is assumed that these effects are reflected in banks' financial statements. The regression analysis investigates the emergence of profit and losses from fair value financial instruments. In total, the empirical analysis showed no or only minor evidence that the recognition and measurement of financial assets and liabilities at fair value added additional procyclicality and had not significantly contributed to the financial crisis through contagion effects.

The latest financial crisis was a comprehensive challenge, also for the International Financial Accounting Standards. Certain weaknesses regarding the application of fair value accounting came to the fore as some financial institutions were experiencing above average losses from fair value instruments. Moreover, a fundamental fair value assumption was violated, that determination of fair value shall be made without any intention or need neither to liquidate

instruments nor to undertake a transaction on adverse terms. The IASB quickly amended these inconsistencies due to political pressure and to be consisted with US GAAP requirements. The amendments allowed financial institutions to reclassify certain fair value financial instruments to amortized cost categories. Hence, reclassifying institutions avoided unrealized losses of financial instruments. The softening of these accounting principles brought short-term remedy, but some long-term effects persist in form of a possible prolonging of market inefficiencies and a lack of trust towards the standard setter due the unusual accelerated process of endorsement.

In summary, fair value accounting seems to be a reasonable and necessary measure to reflect the risk and rewards for certain financial instruments due to changes in market circumstances and the development and increased usage of specific financial instruments (e.g. derivatives, modern trading transactions). It provides a possibility that is needed to best reflect the value of these financial instruments. The findings of the empirical analysis seem to support arguments about the general relevance and reliability of fair values. The data set of the European financial institutions showed no or only minor evidence that fair value accounting provided procyclical effects. Nevertheless, there exist certain limitations towards fair value accounting which should be considered when interpreting these results. It can be challenging when markets perform exceptionally negative or in connection with a determination of fair values in absence of quoted market prices in an active market. Finally, it is important to recognize that as long as fair value accounting improves the presentation and better reflects economic conditions (either by the intention to hold the asset or by the instrument itself); it is the preferable and appropriate measure.

7.3.   Implications and Contributions

This study contributes to research in the field of economical history of financial crisis as well as to the fields of accounting and financial reporting. It is a first step towards better understanding of the association between financial crisis and implications from fair value accounting on financial institutions.

The study provides evidence for the reoccurring events of financial market crisis. As the review of related literature demonstrated, financial crises in developed economies are recurring events and often follow a similar pattern. Strong increases in the supplies of credit combined with investors' optimism lead to rapid economic growth. An increasing number of individuals invest in securities and assets seeking for short-term profits due to the expeditious rise in value. Households and business firms become more optimistic and

consumption and investment grow. Normally, this situation results in an economic boom phase but entails the potential of bubbles in prices in real estate and stocks due to the large increases in credit supply and the euphorically behavior of market participants. When growth of the economy weakens or a sudden drop in prices occurs, the effect reveals that over-heated prices are not sustainable in the long-run and may lead to further consequences, in the worst case to financial crisis.

In consideration of these circumstances, the origin of financial crises is not directly related to accounting and financial reporting. However, the role of fair value accounting cannot be excluded during the latest financial crisis. In this context, the study contributes to the general usefulness of international financial reporting standards and the ongoing debate of fair values in financial statements. Financial reporting under IFRS is established to provide comparable and useful information on financial position and performance of a reporting entity. Thereby, the focus is primarily based on the informational needs of investors. The fundamental objective of IFRS is to provide financial information to external users to build up rapport and confidence and to reduce information asymmetries between management and investors. As such, fair value accounting seems to contribute to these objectives. Furthermore, the study provides evidence on the application of fair values in accounting practice. In this context, fair value accounting appears as the best measure to reflect the risk and rewards of certain financial instruments. The analysis performed in the course of the study found no evidence that fair value accounting added additional procylicality on European financial institutions during times of crisis. The subprime crisis induced some problems regarding fair value accounting on distorted markets, which were quickly removed by the IASB. However, these amendments might have some long-term impact and indicate to conduct further empirical research with regard to implications of fair value accounting in subsequent years.

7.4.   Outlook and Perspectives

The financial turmoil that started in 2007 revealed weaknesses in the area of fair value accounting. While fair value valuations may have contributed to the crisis, the international community of interest represents the opinion that fair value accounting itself did not appear to significantly contribute to bank failures and recommended the further application of fair value principles (SEC, 2008; International Monetary Fund, 2009; IASB, 2011). Nevertheless, there exists certain consent that enhancement is needed to improve general banking system as well as accounting and fair value principles. The improvements regarding fair value accounting shall provide explicit guidance how to determine fair value in case of less active

markets and improve the fair value disclosure about measurement uncertainty (IASB, 2011, p. 5).

First of all, financial institutions should be more independent towards business cycle fluctuations by supplying additional capital buffers in equity and better provisions, especially when more assets and liabilities are measured at fair value. This amendment is not only fair value related; but is applied to stabilize the entire banking system by increasing regulatory and supervisory initiatives. The efforts to strengthen bank capital requirements by increasing bank liquidity and decreasing bank leverage are currently subject of the Third Basel Accord (Bank for International Settlement, 2010; Bank for International Settlement, 2011). It will be gradually introduced from 2014 on. The resulting increases in capital requirements are also expected to buffer short-term price declines in fair value instruments.

Secondly, the subprime crisis led to less active and distorted markets. This development challenged financial institutions in determining fair values for their instruments. Enterprises are required by IFRS to use primarily (unadjusted) quoted prices in active markets to determine fair values. Only subordinated, if quoted market prices are not available, enterprises are allowed to apply certain valuation techniques. The input factors used in valuation techniques are observable inputs other than quoted market prices, or even unobservable, self-provided inputs. Subsequently, if activity in markets declines, the proportions of company-specific subjectivity increase due to the increased usage of derived or self-provided input factors. The IASB encounter this trend by calling for improved disclosure about valuation, methodologies and the uncertainty associated with valuation. This is reflected in the amendment to IFRS 7 "Improving Disclosures about Financial Instruments" that partly deals with the enhancement of fair value disclosures. Furthermore, the new standard IFRS 13 "Fair Value Measurements" provides a single framework for measuring fair value and additional fair value disclosure requirements[106], especially when entities use valuation models to determine fair value. The enhanced disclosure shall provide more information regarding inputs used to measure fair value and measurement uncertainty. Whether and to what extent the enhanced IFRS disclosures regarding fair value are reasonable and more adequate defines the future. Furthermore, the European Banking Authority (EBA)[107] was established as regulatory agency of the EU. Its objectives are regulation and supervision across the European banking sector.

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[106] Some of the disclosure requirements introduced under "Amendments to IFRS 7" have even been relocated to IFRS 13.
[107] The precursor body of the EBA was the Committee of European Banking Supervisors (CEBS), which was originally entrusted with the process. On 1 January 2011, the EBA took over all existing responsibilities and tasks of the CEBS.

The EBA provides a single set of prudential rules in banking (European Single Rulebook), assess risk und vulnerabilities of the EU banking sector, and thereby harmonizes the reporting to supervisory authorities in Europe. Most regulated financial institutions are obliged to make their regular statutory reports from 1 January 2014 onwards. Financial institutions have to provide detailed financial data to their supervisory authority and at a higher frequency than for the annual financial statements required. Part of the required data is based on IFRS financial data that financial institutions already collect for their accounting purposes, mainly for the year-end financial statements. However, the application of the EBA requirements to proliferate the focus on IFRS data, may lead to further harmonization but to some adaption effects as well. In this context, Barth & Landsman (2010) pointed out that the stability of the financial system is a responsibility of the supervisory authority, not the accounting standard setter (Barth & Landsman, 2010, p. 405). However, both should find some common ground for practicability and efficiency reasons. Overall, this topic provides a fertile ground for further study.

Thirdly, Novoa et al (2009) pointed out that an increase in the proportion of liabilities measured at fair value has the potential to absorb procyclical effects on financial statements (Novoa et al, 2009, p. 22). As shown in chapter 6.5.1 and 6.5.2, the proportions of financial assets measured at fair value surmount the fair value financial liabilities. As a result, sharp rises or drops in prices of financial instruments at fair value may have the effect that these circumstances are reflected in a separate time perspective. However, to increase the proportion of financial institutions'' liabilities measured at fair value provoke some counterintuitive outcome. If the worthiness of a financial institution deteriorates, the subsequent decline in value of their own fair value liabilities would generate profits and so improve the financial institution's equity position, which would create wrong incentives.

Fourthly, even if not explicit object of investigation in this study, illiquid markets played an important role during the financial crisis. In case of liquidity shortages in financial markets, fair value accounting has a potential to reinforce these problems. Typically, the occurrence of illiquid markets is characterized by financial institutions that have difficulties to attract sufficient liquid funds to meet their financial commitments. This scenario has a potential to create a downward spiral in which prices of fair value financial instruments drop below their intrinsic value, fair value losses increase, but at the same time financial institutions encounter a need to sell these instruments in order to meet capital requirements. This may force institutions to additional disposals that have supplementary impact on prices, leading to a vicious cycle. Government interference may be necessary in order to stop this downside trend.

In conclusion, financial crises are primarily caused by incorrect management decisions in a changing environment, not by the presentation in financial statements. Nevertheless, because of the innovations triggered by fair value accounting some economic activity becomes more obvious and may be seen on the entities balance sheet at an earlier stage. This could exacerbate cyclical movements in financial assets and liabilities. Previous accounting framework that were solely based on historical and amortized cost would also reflect these circumstances, but unlikely at the same pace as fair value accounting recognizes them as they develop. Even so, there is no serious alternative to fair value accounting for certain financial instruments. A recursion to an accounting system with amortized and historical costs only seems not appropriate as it would temporarily ignore market prices and delay potential problems, which might boost the crisis. Financial institutions and supervisory authorities need to adjust to the new circumstances, where the occurrence of losses is immediately reflected in entities' financial statements.

To encounter the cyclical behavior of fair value accounting, it seems necessary to amend accounting standards or regulatory requirements. As Laux & Leuz (2009) recommend, an application of prudential regulation should be preferred instead of adjusting fair value accounting principles (Laux & Leuz, 2009, p. 19). Fair value accounting should be seen as the acceptable measure that on the one hand may introduce more volatility, but on the other hand illustrates negative developments as they arise and makes it even more difficult for financial institutions to hide upcoming problems in their financial statements. Therefore prudential regulation should imply explicit counter-cyclical capital requirements to meet financial stability. This is in accordance with the results from chapter six. Fair value accounting seems to be the appropriate measure for certain financial instruments and thereby best reflect economic conditions. In this regard, the debate of financial accounting at fair value is still full of energy and upcoming regulatory and accounting standard changes give rise to many opportunities for future research.

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Appendix

Appendix A1: BvD Bankscope Data defintion

	Variable	Universal bank model code	Data definition
P+L Effects	Net Gains (Losses) on Trading and Derivatives	10090	Trading income, including marking to market of derivatives, on currently related transactions, interest-rate instruments, equities and other trading assets, excluding insurance-related trading income
	Net Gains (Losses) on Other Securities	10100	Gains/losses realised on AFS securities and other securities revalued through the income statement
	Net Gains (Losses) on Assets at FV through Income Statement	10105	Gains/losses on fair-value hedges and the fair value changes of the assets/liabilities they are hedging
	Change in Value of AFS Investments	10310	The net amount of the revaluation of AFS investments in the reporting period that remains unrealized and is taken directly to equity
Assets	Trading Securities and at FV through Income	11150	All securities and assets classified as held for trading, excluding derivatives
	Derivatives	11160	All in-the-money trading derivatives and derivatives recognized for hedging, less the value of netting arrangements
	Available for Sale Securities	11170	Investment securities designated as "available for sale"; recorded at fair value
	Total Assets	11350	Includes Total earning assets + Cash and due from banks + Foreclosed real estate + Fixed assets + Goodwill + Other intangibles + Current tax assets + deferred tax + Discontinued operations + Other assets
Liab	Derivatives	11630	Out-of-the money trading and hedging derivatives, less the value of netting arrangements
	Trading Liabilities	11640	Short positions, repos; short-tem notes and other financial liabilities classified as held for trading
	Total Liabilities	11750	Includes Total interest-bearing liabilities + Fair value portion of debt + Credit impairment reserves + Reserves for pension and other + Tax liabilities + Other deferred liabilities + Discontinued operations + Insurance + Other non-interest-bearing liabilities

Source: Bankscope

In 2006, 24.8% of total assets are denominated in Non-Euro currencies, of which Great Britain (18.8%) and Switzerland (4.1%) are the most significant countries. The values of these two countries have been pegged to their 2006 currency exchange rate to avoid any side effects due to currency conversion.

year-end	1 EUR in GBP	1 EUR in CHF	Matching coefficent GBP	Matching coefficent CHF
2006	0.6715	1.6069		
2007	0.7334	1.6547	0.9156	0.9711
2008	0.9525	1.4850	0.7050	1.0821
2009	0.8881	1.4836	0.7561	1.0831
2010	0.8602	1.2475	0.7806	1.2881

EUR/GDP (1. January 2006 – 31. December 2010)

EUR/CHF (1. January 2006 – 31. December 2010)
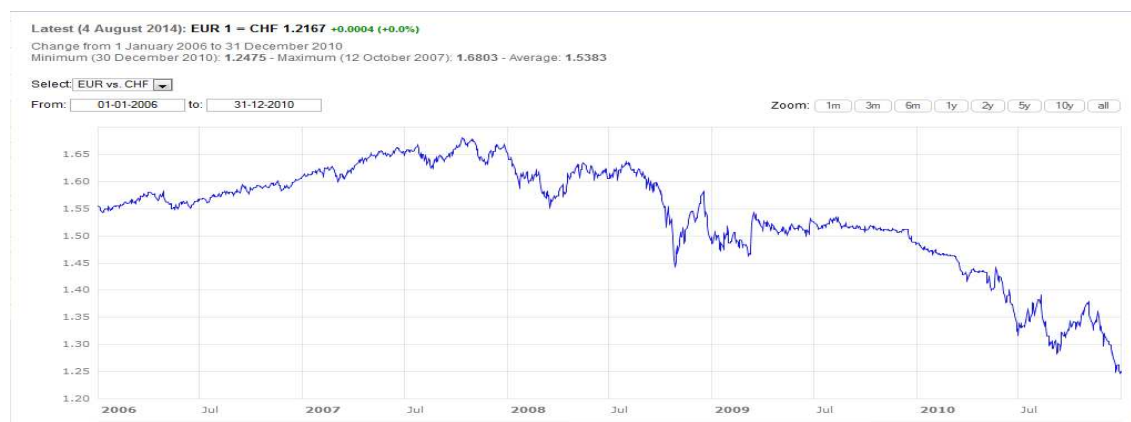
Source: European Central Bank, compiled by the author
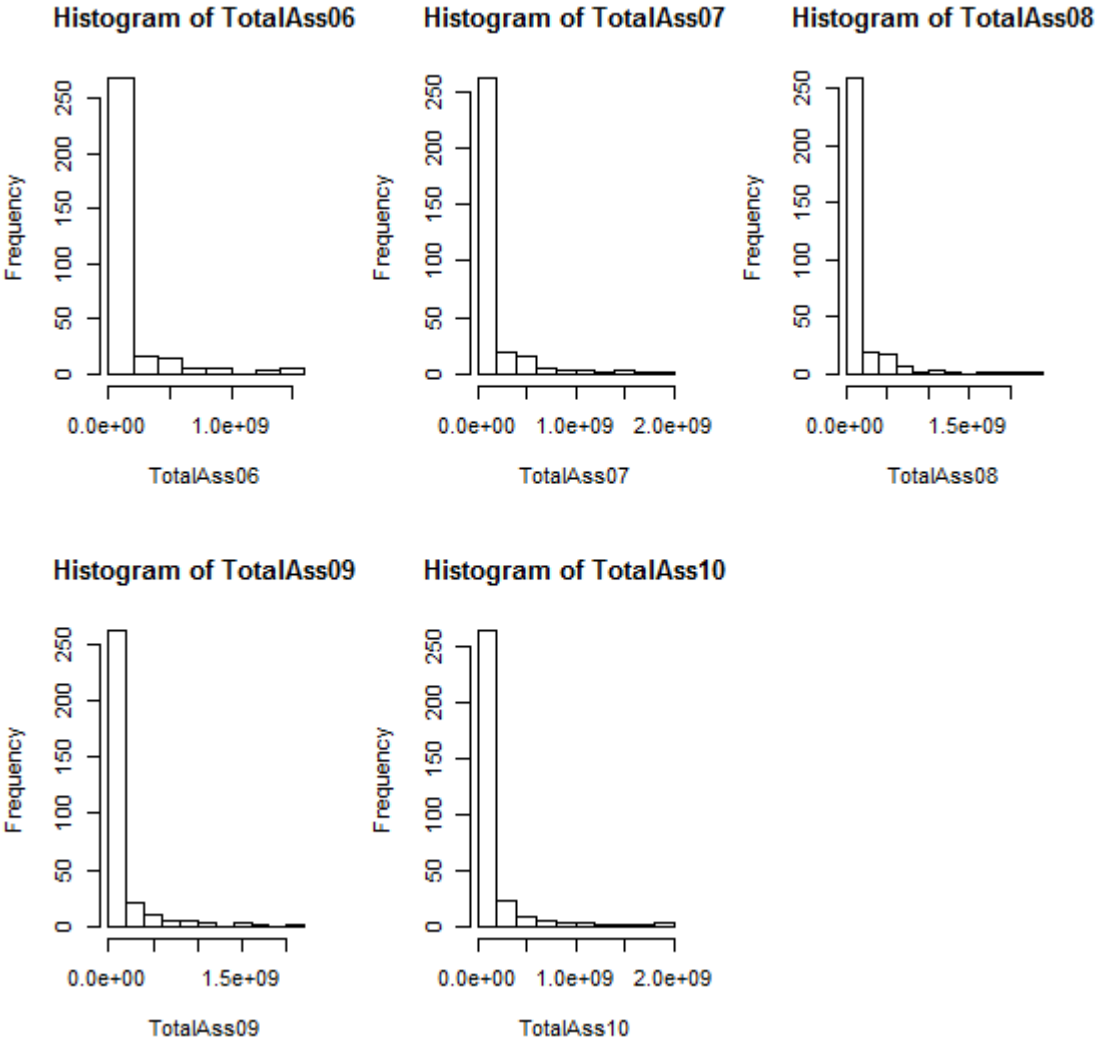
http://www.ecb.europa.eu/stats/exchange/eurofxref/html/index.en.html

Source: Bankscope dataset, compiled by the author

in Mil EUR	Assets 2006	Arithmetic mean (absolut)	Arithmetic mean (relative)
Trading and at FV through Income	6,387,119	20,212	17.0%
Derivatives	2,609,516	8,258	6.9%
Available for Sale Securities	4,121,538	13,043	11.0%
Assets at Fair value	13,118,173	41,513	34.9%
Assets at Amortized cost	24,462,512	77,413	65.1%
Total Assets	37,580,685	118,926	100.0%

in Mil EUR	Assets 2007	Arithmetic mean (absolut)	Arithmetic mean (relative)
Trading and at FV through Income	6,662,043	21,082	16.2%
Derivatives	3,627,921	11,481	8.8%
Available for Sale Securities	4,424,635	14,002	10.7%
Assets at Fair value	14,714,599	46,565	35.7%
Assets at Amortized cost	26,532,275	83,963	64.3%
Total Assets	41,246,874	130,528	100.0%

in Mil EUR	Assets 2008	Arithmetic mean (absolut)	Arithmetic mean (relative)
Trading and at FV through Income	4,469,305	14,143	10.5%
Derivatives	7,776,778	24,610	18.2%
Available for Sale Securities	3,444,760	10,901	8.1%
Assets at Fair value	15,690,843	49,655	36.7%
Assets at Amortized cost	27,043,326	85,580	63.3%
Total Assets	42,734,169	135,235	100.0%

in Mil EUR	Assets 2009	Arithmetic mean (absolut)	Arithmetic mean (relative)
Trading and at FV through Income	3,952,748	12,509	9.8%
Derivatives	4,831,830	15,291	12.0%
Available for Sale Securities	3,599,928	11,392	9.0%
Assets at Fair value	12,384,505	39,191	30.9%
Assets at Amortized cost	27,750,928	87,819	69.1%
Total Assets	40,135,433	127,011	100.0%

in Mil EUR	Assets 2010	Arithmetic mean (absolut)	Arithmetic mean (relative)
Trading and at FV through Income	4,147,245	13,124	10.1%
Derivatives	5,238,403	16,577	12.7%
Available for Sale Securities	3,665,696	11,600	8.9%
Assets at Fair value	13,051,344	41,302	31.6%
Assets at Amortized cost	28,187,488	89,201	68.4%
Total Assets	41,238,832	130,503	100.0%

Growth rates of respective positions

Growth rates	2007	2008	2009	2010
Trading and at FV through Income	4.3%	-32.9%	-11.6%	4.9%
Derivatives	39.0%	114.4%	-37.9%	8.4%
Available for Sale Securities	7.4%	-22.1%	4.5%	1.8%
Assets at Fair value	12.2%	6.6%	-21.1%	5.4%
Assets at amortized cost	8.5%	1.9%	2.6%	1.6%
Total Assets	9.8%	3.6%	-6.1%	2.7%

Source: Bankscope dataset, compiled by the author

in Mil EUR	Liabilities 2006	Arithmetic mean (absolut)	Arithmetic mean (relative)
Derivatives	2,834,208,644	8,969,015	7.9%
Trading Liabilities	2,631,471,793	8,327,442	7.3%
Liabilities at Fair value	5,465,680,437	17,296,457	15.2%
Liabilities at Cost	30,421,453,014	96,270,421	84.8%
Total Liabilities	35,887,133,450	113,566,878	100.0%

in Mil EUR	Liabilities 2007	Arithmetic mean (absolut)	Arithmetic mean (relative)
Derivatives	3,713,505,884	11,751,601	9.4%
Trading Liabilities	3,258,937,639	10,313,094	8.3%
Liabilities at Fair value	6,972,443,523	22,064,695	17.7%
Liabilities at Cost	32,425,541,890	102,612,474	82.3%
Total Liabilities	39,397,985,413	124,677,169	100.0%

in Mil EUR	Liabilities 2008	Arithmetic mean (absolut)	Arithmetic mean (relative)
Derivatives	7,718,566,711	24,425,844	18.8%
Trading Liabilities	2,437,976,292	7,715,115	5.9%
Liabilities at Fair value	10,156,543,002	32,140,959	24.7%
Liabilities at Cost	30,911,669,887	97,821,740	75.3%
Total Liabilities	41,068,212,889	129,962,699	100.0%

in Mil EUR	Liabilities 2009	Arithmetic mean (absolut)	Arithmetic mean (relative)
Derivatives	4,781,713,567	15,132,005	12.5%
Trading Liabilities	2,117,853,668	6,702,069	5.6%
Liabilities at Fair value	6,899,567,235	21,834,074	18.1%
Liabilities at Cost	31,220,959,233	98,800,504	81.9%
Total Liabilities	38,120,526,468	120,634,577	100.0%

in Mil EUR	Liabilities 2010	Arithmetic mean (absolut)	Arithmetic mean (relative)
Derivatives	5,243,920,647	16,594,686	13.4%
Trading Liabilities	2,295,192,101	7,263,266	5.9%
Liabilities at Fair value	7,539,112,747	23,857,952	19.3%
Liabilities at Cost	31,531,499,404	99,783,226	80.7%
Total Liabilities	39,070,612,151	123,641,178	100.0%

Growth rates of respective positions

Growth rates	2007	2008	2009	2010
Derivatives	31.0%	107.9%	-38.0%	9.7%
Trading Liabilities	23.8%	-25.2%	-13.1%	8.4%
Liabilities at Fair value	27.6%	45.7%	-32.1%	9.3%
Liabilities at cost	6.6%	-4.7%	1.0%	1.0%
Total Liabilities	9.8%	4.2%	-7.2%	2.5%

Source: Bankscope dataset, compiled by the author

Appendix A6: Overview of Selected Countries with High Increases of Financial Liabilities
in Relative Terms

2006	Derivatives	Trading Liabilities	Total Liabilities	Derivatives in %	Trading Liabilities in %	Fair Value Liabilities in %
CH	188,903,974	128,557,150	1,497,316,179	12.6%	8.6%	21.2%
DE	699,872,000	437,150,000	6,021,697,100	11.6%	7.3%	18.9%
GB	576,503,992	550,767,843	6,764,076,080	8.5%	8.1%	16.7%
DK	19,368,360	12,353,948	353,097,836	5.5%	3.5%	9.0%
BE	133,441,300	67,145,600	2,562,405,100	5.2%	2.6%	7.8%
LU	8,623,658	1,548,740	187,497,840	4.6%	0.8%	5.4%
IE	15,573,721	1,169,626	401,055,206	3.9%	0.3%	4.2%

2007	Derivatives	Trading Liabilities	Total Liabilities	Derivatives in %	Trading Liabilities in %	Fair Value Liabilities in %
CH	265,784,452	97,550,228	1,395,617,820	19.0%	7.0%	26.0%
DE	847,824,500	768,444,700	6,642,881,900	12.8%	11.6%	24.3%
GB	871,600,039	591,809,655	6,991,446,316	12.5%	8.5%	20.9%
DK	29,552,829	14,825,471	431,822,105	6.8%	3.4%	10.3%
BE	148,703,100	101,745,000	2,841,397,700	5.2%	3.6%	8.8%
LU	11,554,323	3,988,016	228,129,876	5.1%	1.7%	6.8%
IE	17,429,282	8,056,547	419,829,612	4.2%	1.9%	6.1%

2008	Derivatives	Trading Liabilities	Total Liabilities	Derivatives in %	Trading Liabilities in %	Fair Value Liabilities in %
CH	627,186,978	47,636,829	1,558,859,044	40.2%	3.1%	43.3%
DE	1,813,090,900	468,510,000	7,227,983,600	25.1%	6.5%	31.6%
GB	1,938,197,887	346,075,494	6,294,121,969	30.8%	5.5%	36.3%
DK	79,065,249	5,679,032	466,128,758	17.0%	1.2%	18.2%
BE	290,503,300	79,519,200	2,780,596,100	10.4%	2.9%	13.3%
LU	14,545,339	3,363,614	219,383,324	6.6%	1.5%	8.2%
IE	39,691,909	3,412,559	452,206,596	8.8%	0.8%	9.5%

2009	Derivatives	Trading Liabilities	Total Liabilities	Derivatives in %	Trading Liabilities in %	Fair Value Liabilities in %
CH	305,626,541	38,424,679	1,085,845,187	28.1%	3.5%	31.7%
DE	1,210,029,800	363,604,700	6,211,934,000	19.5%	5.9%	25.3%
GB	1,043,064,802	415,790,619	6,326,399,098	16.5%	6.6%	23.1%
DK	41,116,486	9,783,188	395,093,163	10.4%	2.5%	12.9%
BE	225,626,700	87,643,000	2,558,488,500	8.8%	3.4%	12.2%
LU	15,966,783	12,042,687	193,900,177	8.2%	6.2%	14.4%
IE	31,456,533	2,381,100	400,208,292	7.9%	0.6%	8.5%

2010	Derivatives	Trading Liabilities	Total Liabilities	Derivatives in %	Trading Liabilities in %	Fair Value Liabilities in %
CH	409,972,305	58,994,418	1,467,630,312	27.9%	4.0%	32.0%
DE	1,332,886,600	324,030,000	6,212,360,000	21.5%	5.2%	26.7%
GB	1,177,144,127	612,050,576	7,322,238,371	16.1%	8.4%	24.4%
DK	42,522,527	21,258,863	408,583,488	10.4%	5.2%	15.6%
BE	216,605,400	72,912,400	1,707,433,000	12.7%	4.3%	17.0%
LU	16,618,069	11,822,086	177,182,683	9.4%	6.7%	16.1%
IE	32,630,377	1,211,400	308,033,381	10.6%	0.4%	11.0%

Source: Bankscope dataset, compiled by the author

Appendix A7: Regression Diagnostics

bank.reg1
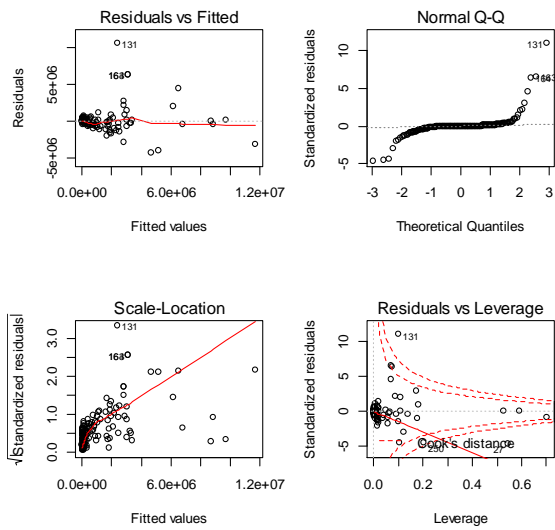
bank.reg2
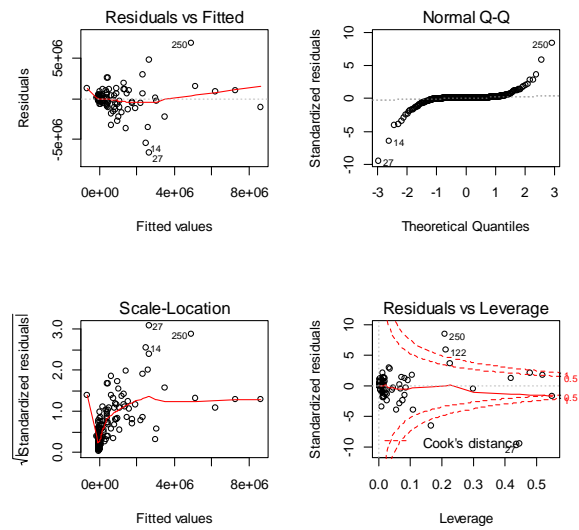
bank.reg3
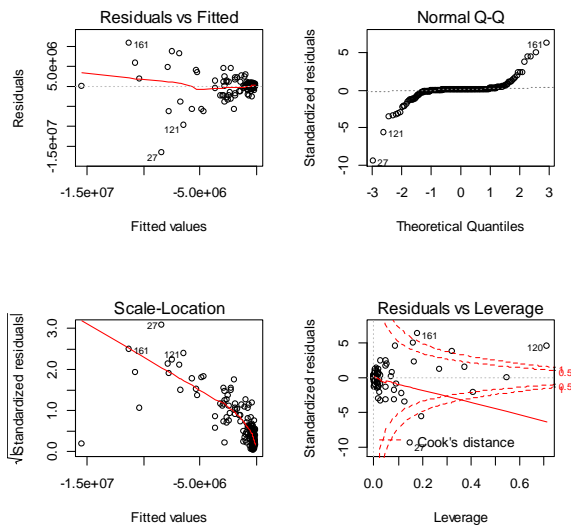
bank.reg4
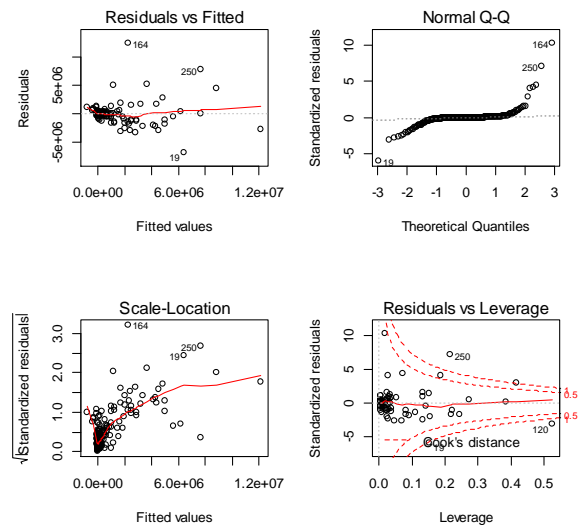
bank.reg5
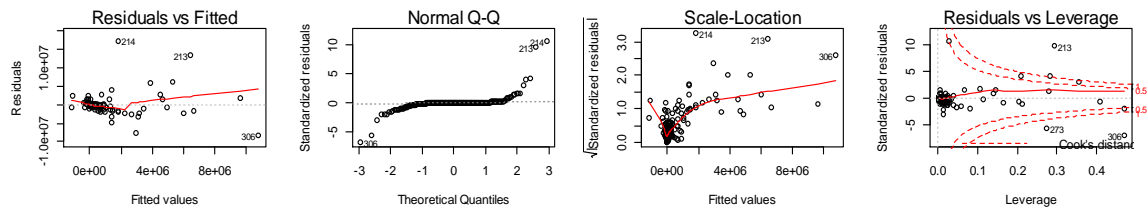
Source: Bankscope dataset, compiled by the author

Regression diagnostics show some indications of non-normality. QQ plots show some deviations in the upper and lower ends, which is often the case in economic or financial modeling. Anyhow, extreme values are not removed from the data if there are more of them than expected under normal conditions. For sample sizes that are sufficient large, this violation of the normality assumption is virtually inconsequential (Brooks, 2014, p. 210-2011).

Appendix A8: Multicollinearity Diagnostics

The following tables show the correlation matrices and variance inflation factors of the overall sample:

```
> with(bank.reg1, round(cor(cbind(AssTrad06,AssDeri06,LiaDeri06,LiaTrad06,AssAfS06)),2))
```

	AssTrad06	AssDeri06	LiaDeri06	LiaTrad06	AssAfS06
AssTrad06	1	0.88	-0.88	-0.87	0.45
AssDeri06	0.88	1	-0.99	-0.69	0.38
LiaDeri06	-0.88	-0.99	1	0.67	-0.38
LiaTrad06	-0.87	-0.69	0.67	1	-0.48
AssAfS06	0.45	0.38	-0.38	-0.48	1

	AssTrad07	AssDeri07	LiaDeri07	LiaTrad07	AssAfS07
AssTrad07	1	0.87	-0.87	-0.92	0.48
AssDeri07	0.87	1	-1	-0.77	0.37
LiaDeri07	-0.87	-1	1	0.75	-0.36
LiaTrad07	-0.92	-0.77	0.75	1	-0.48
AssAfS07	0.48	0.37	-0.36	-0.48	1

```
> vif(bank.reg1)
```

AssTrad06	AssDeri06	LiaDeri06	LiaTrad06	AssAfS06
12.407131	48.470704	53.312623	5.598249	1.314759

AssTrad07	AssDeri07	LiaDeri07	LiaTrad07	AssAfS07
12.486365	146.805852	148.790019	7.374041	1.331538

	AssTrad08	AssDeri08	LiaDeri08	LiaTrad08	AssAfS08
AssTrad08	1	0.8	-0.8	-0.86	0.51
AssDeri08	0.8	1	-1	-0.53	0.33
LiaDeri08	-0.8	-1	1	0.53	-0.33
LiaTrad08	-0.86	-0.53	0.53	1	-0.56
AssAfS08	0.51	0.33	-0.33	-0.56	1

	AssTrad09	AssDeri09	LiaDeri09	LiaTrad09	AssAfS09
AssTrad09	1	0.8	-0.81	-0.87	0.7
AssDeri09	0.8	1	-1	-0.64	0.48
LiaDeri09	-0.81	-1	1	0.64	-0.48
LiaTrad09	-0.87	-0.64	0.64	1	-0.71
AssAfS09	0.7	0.48	-0.48	-0.71	1

	AssTrad08	AssDeri08	LiaDeri08	LiaTrad08	AssAfS08
	12.531603	316.77054	335.036486	6.812822	1.460204

	AssTrad09	AssDeri09	LiaDeri09	LiaTrad09	AssAfS09
	9.579869	223.861217	237.0873	5.426504	2.19185

	AssTrad10	AssDeri10	LiaDeri10	LiaTrad10	AssAfS10
AssTrad10	1	0.81	-0.82	-0.9	0.75
AssDeri10	0.81	1	-1	-0.68	0.5
LiaDeri10	-0.82	-1	1	0.69	-0.52
LiaTrad10	-0.9	-0.68	0.69	1	-0.76
AssAfS10	0.75	0.5	-0.52	-0.76	1

	AssTrad10	AssDeri10	LiaDeri10	LiaTrad10	AssAfS10
	10.964178	257.251192	277.236514	6.045316	2.640968

Source: Bankscope dataset, compiled by the author

The tables show high correlations between the variables used in the analysis using the full sample. Trading assets and liabilities as well as derivative assets and liabilities are highly correlated. From an accounting perspective, particular criteria have to be met when certain positions shall be offset (see IAS 32.42). This can raise a number of further issues regarding presentation and comparability. For checking purposes, the respective predictors are aggregated to single positions. Trading assets and liabilities (*TradXX*) and derivative assets and liabilities (*DeriXX*) are offset and the multiple regression analysis is performed again. The results are presented below. They show similar outcome to the predictors of the original analysis, albeit with significant reduced multicollinearity.

Call:
lm(formula = PLtotal06 ~ Trad06 + Deri06 + AssAfS06)

Residuals:

Min	1Q	Median	3Q	Max
-3817690	-66037	-23842	22853	10205002

Coefficients:

	Estimate	Std. Error	t value	Pr(>|t|)	Signif. codes
(Intercept)	22,790.00000	63,380.00000	0.36000	0.71900	
Trad06	0.02807	0.00163	17.25400	<2e-16	***
Deri06	0.01722	0.01153	1.49300	0.13600	
AssAfS06	0.01770	0.00201	8.82000	<2e-16	***

Residual standard error: 1028000 on 312 degrees of freedom
Multiple R-squared: 0.6663, Adjusted R-squared: 0.6631
F-statistic: 207.6 on 3 and 312 DF, p-value: < 2.2e-16

Residuals:

Min	1Q	Median	3Q	Max
-8809369	-9098	59087	84283	7156301

Coefficients:

		Estimate	Std. Error		t value	Pr(>|t|)	Signif. codes
(Intercept)	-	62,110.00000	63,460.00000	-	0.97900	0.32847	
Trad07		0.01473	0.00186		7.93200	0.00000	***
Deri07		0.05341	0.01466		3.64200	0.00032	***
AssAfS07		0.01518	0.00181		8.37100	0.00000	***

Residual standard error: 1037000 on 312 degrees of freedom
Multiple R-squared: 0.4143, Adjusted R-squared: 0.4087
F-statistic: 73.57 on 3 and 312 DF, p-value: < 2.2e-16

Residuals:

Min	1Q	Median	3Q	Max
-17779005	18525	142749	223242	9355206

Coefficients:

		Estimate	Std. Error		t value	Pr(>|t|)	Signif. codes
(Intercept)	-	139,600.00000	123,100.00000	-	1.13400	0.25800	
Trad08	-	0.03682	0.00422	-	8.73500	<2e-16	***
Deri08	-	0.01448	0.01623	-	0.89200	0.37300	
AssAfS08	-	0.03815	0.00428	-	8.90600	<2e-16	***

Residual standard error: 2021000 on 312 degrees of freedom
Multiple R-squared: 0.4202, Adjusted R-squared: 0.4146
F-statistic: 75.37 on 3 and 312 DF, p-value: < 2.2e-16

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residuals:

Min	1Q	Median	3Q	Max
-6777516	-81050	7947	46355	12462692

Coefficients:

		Estimate	Std. Error		t value	Pr(>|t|)	Signif. codes
(Intercept)	-	14,330.00000	74,520.00000	-	0.19200	0.84768	
Trad09		0.01064	0.00345		3.08400	0.00222	**
Deri09		0.08319	0.01493		5.57100	0.00000	***
AssAfS09		0.04182	0.00281		14.91000	< 2e-16	***

Residual standard error: 1229000 on 312 degrees of freedom
Multiple R-squared: 0.5823, Adjusted R-squared: 0.5783
F-statistic: 145 on 3 and 312 DF, p-value: < 2.2e-16

Residuals:

Min	1Q	Median	3Q	Max
-6537760	-37568	67932	89469	10778855

Coefficients:

		Estimate	Std. Error		t value	Pr(>|t|)	Signif. codes
(Intercept)	-	81,980.00000	76,190.00000	-	1.07600	0.28275	
Trad10		0.02141	0.00351		6.09900	0.00000	***
Deri10		0.04116	0.01531		2.68800	0.00757	**
AssAfS10		0.02005	0.00291		6.89500	0.00000	***

Residual standard error: 1258000 on 312 degrees of freedom
Multiple R-squared: 0.39, Adjusted R-squared: 0.3842
F-statistic: 66.5 on 3 and 312 DF, p-value: < 2.2e-16

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

> with(reg1, round(cor(cbind(Trad06,Deri06,AssAfS06)),2))

	Trad06	Deri06	AssAfS06
Trad06	1	-0.51	0.34
Deri06	-0.51	1	-0.15
AssAfS06	0.34	-0.15	1

> vif(bank.reg1)

	Trad06	Deri06	AssAfS06
	1.483483	1.346694	1.127908

	Trad07	Deri07	AssAfS07
Trad07	1	-0.38	0.38
Deri07	-0.38	1	-0.03
AssAfS07	0.38	-0.03	1

	Trad07	Deri07	AssAfS07
	1.385008	1.18781	1.188535

	Trad08	Deri08	AssAfS08
Trad08	1	0.18	0.28
Deri08	0.18	1	0.18
AssAfS08	0.28	0.18	1

	Trad08	Deri08	AssAfS08
	1.103929	1.051804	1.102907

0	Trad09	Deri09	AssAfS09
Trad09	1	0.09	0.51
Deri09	0.09	1	0.12
AssAfS09	0.51	0.12	1

	Trad09	Deri09	AssAfS09
	1.346758	1.01559	1.354394

	Trad10	Deri10	AssAfS10
Trad10	1	0.02	0.56
Deri10	0.02	1	0.01
AssAfS10	0.56	0.01	1

	Trad10	Deri10	AssAfS10
	1.452099	1.000581	1.451402

Source: Bankscope dataset, compiled by the author

Appendix A9: Outliers and Influential Observations

The R function >*Influcence.measures* is applied to identify outliers and influential observations. It produces a class "infl" object tabular display showing the DFBETAS for each model variable, DFFITS, covariance ratios, Cook's distances and the diagonal elements of the hat matrix. The influential observations arise mainly from large banking institutions with strong characteristics in the respective positions. These are not caused by measurement errors and so do not justify a removal of data points. In Appendix 9, influential cases with respect to any of the above mentioned measures are removed from the sample (for each year separately). Regression results are shown in the following tables:

Call:
lm(formula = PLtotal06c ~ AssTrad06c + AssDeri06c + LiaDeri06c +
    LiaTrad06c + AssAfS06c)

Residuals:

Min	1Q	Median	3Q	Max
-1523896	-43223	-26969	32553	1428697

Coefficients:

	Estimate	Std. Error	t value	Pr(>|t|)	Signif. codes
(Intercept)	31,190.00000	18,370.00000	1.69800	0.09050	.
AssTrad06	0.01957	0.00245	7.99000	0.00000	***
AssDeri06	0.02230	0.01962	1.13700	0.25650	
LiaDeri06	0.02116	0.02048	1.03300	0.30250	
LiaTrad06	0.00183	0.00373	0.49100	0.62410	
AssAfS06	0.00725	0.00151	4.80300	0.00000	***

Residual standard error: 285400 on 285 degrees of freedom
Multiple R-squared: 0.7343,   Adjusted R-squared: 0.7296
F-statistic: 157.5 on 5 and 285 DF, p-value: < 2.2e-16

Residuals:

Min	1Q	Median	3Q	Max
-1698881	-34309	-709	34898	2119421

Coefficients:

	Estimate	Std. Error	t value	Pr(>|t|)	Signif. codes
(Intercept)	1,632.00000	21,260.00000	0.07700	0.93900	
AssTrad07	0.01984	0.00361	5.50100	0.00000	***
AssDeri07	0.01355	0.02459	0.55100	0.58200	
LiaDeri07	0.02669	0.02415	1.10500	0.27000	
LiaTrad07	0.00483	0.00439	1.10100	0.27200	
AssAfS07	0.00250	0.00171	1.46200	0.14500	

Residual standard error: 328600 on 283 degrees of freedom
Multiple R-squared: 0.3677,   Adjusted R-squared: 0.3565
F-statistic: 32.92 on 5 and 283 DF, p-value: < 2.2e-16

Residuals:

Min	1Q	Median	3Q	Max
-3233187	-48839	18959	112169	3354725

Coefficients:

		Estimate	Std. Error		t value	Pr(>|t|)	Signif. codes
(Intercept)	-	16,440.00000	42,890.00000	-	0.38300	0.70177	
AssTrad08		0.04260	0.00601		7.08800	0.00000	***
AssDeri08		0.09705	0.02243		4.32600	0.00002	***
LiaDeri08		0.12970	0.02198		5.90000	0.00000	***
LiaTrad08		0.02588	0.00776		3.33700	0.00096	***
AssAfS08	-	0.04614	0.00402	-	11.47400	< 2e-16	***

Residual standard error: 663000 on 286 degrees of freedom
Multiple R-squared: 0.5998,   Adjusted R-squared: 0.5928
F-statistic: 85.73 on 5 and 286 DF, p-value: < 2.2e-16

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residuals:

Min	1Q	Median	3Q	Max
-1677865	-57312	-7357	53360	1665520

Coefficients:

		Estimate	Std. Error		t value	Pr(>|t|)	Signif. codes
(Intercept)		9,590.00000	22,110.00000		0.43400	0.66490	
AssTrad09	-	0.02937	0.00391	-	7.51800	0.00000	***
AssDeri09		0.00439	0.01420		0.30900	0.75750	
LiaDeri09	-	0.02334	0.01412	-	1.65300	0.09940	.
LiaTrad09	-	0.02098	0.00415	-	5.05300	0.00000	***
AssAfS09		0.02599	0.00217		12.00000	< 2e-16	***

Residual standard error: 340900 on 284 degrees of freedom
Multiple R-squared: 0.5531,   Adjusted R-squared: 0.5452
F-statistic: 70.3 on 5 and 284 DF, p-value: < 2.2e-16

Residuals:

Min	1Q	Median	3Q	Max
-1847653	-42228	-16269	24248	3054519

Coefficients:

		Estimate	Std. Error		t value	Pr(>|t|)	Signif. codes
(Intercept)		20,110.00000	27,540.00000		0.73000	0.46581	
AssTrad10		0.01826	0.00453		4.02700	0.00007	***
AssDeri10	-	0.02949	0.00806	-	3.66000	0.00030	***
LiaDeri10	-	0.01496	0.00915	-	1.63600	0.10286	
LiaTrad10		0.00294	0.00508		0.57900	0.56296	
AssAfS10	-	0.00275	0.00195	-	1.40800	0.16007	

Residual standard error: 433400 on 293 degrees of freedom
Multiple R-squared: 0.2258,   Adjusted R-squared: 0.2126
F-statistic: 17.09 on 5 and 293 DF, p-value: 7.836e-15

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Source: Bankscope dataset, compiled by the author