SOVEREIGN DEBT DISTRESS
IN THE DEVELOPED AND EMERGING COUNTRIES

SİNAN DURMUŞALİOĞLU

BOĞAZİÇİ UNIVERSITY

2012

SOVEREIGN DEBT DISTRESS

IN THE DEVELOPED AND EMERGING COUNTRIES

Thesis submitted to

The Institute of Graduate Studies in Social Sciences

in partial fulfillment of the requirements for the degree of

Master of Arts in

International Trade Management

By

Sinan Durmuşalioğlu

Bogazici University
2012

Thesis Abstract

Sinan Durmuşalioğlu, "Sovereign Debt Distress

In The Developed and Emerging Countries"

Global financial markets have experienced one of the biggest economic crises since the Great Depression in the 1930s. The negative effect of the economic crisis is felt by all the major economies of the world, especially by the countries with structural fiscal problems. Since financial debt or public debt is crucial for economic growth and development, many major governments have borrowed heavily. Over the last two decades, emerging economies had similar experiences and faced sovereign debt crises as a result of heavy debt burdens. The aim of the study is to investigate the stages of a sovereign debt crisis and determine the major indicators of a debt crisis for major developed and emerging countries over the period of 1993-2011. Ordinary Least Squares (OLS) Method is employed to determine the sources of debt crisis and compare the performances of countries, with quarterly panel data.

The striking feature of the analysis is that major indicators of sovereign debt default have a strong effect in both models for the developed countries and the European countries with default risk. Empirical results indicate that current account balance-to-GDP is important in terms of sovereign debt default for all countries. Total external debt-to-GDP is found to be a very important determinant for sovereign debt default in the developed countries. Interest rates are implied to be an important determinant in advanced countries but it is not that important in emerging markets. Foreign exchange reserves are also important for emerging market countries and more important for European countries with default risk.

Tez Özeti

Sinan Durmuşalioğlu, “Gelişmiş ve Gelişmekte Olan Ülkelerde Kamu Borç Krizleri”

Global finansal piyasalar 1930’lardaki Büyük Bunalım’dan bu yana en büyük ekonomik krizlerden birini yaşadı. Krizin olumsuz etkisi yapısal mali problemleri olan ülkeler başta olmak üzere, belli başlı tüm dünya ekonomileri tarafından hissedildi. Finansal borç veya kamu borcu ekonomik büyüme ve kalkınma açısından çok önemli olduğu için, belli başlı birçok ülke yüksek bir borçlanmaya gitmektedir. Son 20 yıl boyunca, gelişmekte olan ekonomiler, benzer tecrübeler yaşayarak ağır borç yükleri nedeniyle kamu borç krizleriyle karşı karşıya kalmışlardır. Bu çalışmanın amacı, kamu borç krizlerinin aşamalarını araştırmak ve belli başlı gelişmiş ve gelişmekte olan ülkelerde 1993-2011 döneminde yaşanmış borç krizlerinin göstergelerini belirlemektir. En Küçük Kareler Yöntemi çeyrek yıllık datalar ile kullanılarak, krizlerin nedenleri belirlenecek ve ülke performansları karşılaştırılacaktır.

Analizin çarpıcı özelliği, kamu borç iflası konusundaki belli başlı göstergelerin gelişmiş ülkeler ve iflas riskine sahip Avrupa ülkeleri için her iki modeled de güçlü etkiye sahip olmasıdır. İstatistiki sonuçlar, cari denge/GSMH oranının kamı borç iflası konusunda, tüm ülkeler için önemli olduğunu belirtmektedir. Toplam dış borç/GSMH oranının gelişmiş ülkelerde kamu borç iflası konusunda çok önemli bir belirleyici factor olduğu bulunmuştur. Faiz oranlarının gelişmiş ülkeler için önemli olduğuna fakat gelişmekte olan ülkeler için o kadar da önemli olmayan bir belirleyici factor olduğuna işaret edilmiştir. Döviz rezervleri de gelişmekte olan ülkeler için önemlidir ve iflas riskine sahip Avrupa ülkeleri için daha fazla öneme sahiptir.

ACKNOWLEDGMENTS

I would like to present my sincere thanks to my thesis advisor, Assoc. Prof. Emine Nur Günay, for her precious guidance, supervision, technical comments and extreme patience.

I would also like to thank my family for their unconditional support and motivating me during my study. My mother, my father and my brother, they are all very valuable for me. My dear uncle Ramis' motivational support was also extremely valuable.

The encouraging of my beloved friends Ekrem Gökhan Özen, Emre Perk, Ömer Kara and Halil Cengiz, for my academic purposes, has a value beyond words. I would also like to thank my friend Ayşın Gönenç, for reading my previous works. I hope she will enjoy this thesis, too.

CONTENTS

TABLES

FIGURES

CHAPTER 1: INTRODUCTION

Especially from 1970 onwards, a vast amount of sovereign default crises happened in emerging countries (namely 74, between 1970 and 2006) (Gourinchas and Obstfeld, 2011:8). The unusual thing is developed countries started to suffer sovereign debt crises following the Global Crisis of 2008. The most severe of the developed country sovereign debt crises hit the so-called PIIGS (Portugal, Ireland, Italy, Greece and Spain), the other major developed countries suffering sovereign debt distress are the US, the UK and Japan. Debt ceiling debates and deteriorating prospects for US government debt ended up with US' losing its triple-A from S&P as a result of a downgrade. After Latin American Debt Crisis of 1980s, sovereign debt crises and defaults have more frequently repeated. The most infamous episodes are Russia, Ecuador and Argentina. Three major types of risks in terms of sovereign debt are: solvency (debt unsustainability), illiquidity, and macroexchange risks. In emerging markets, there is a strong link between currency crises and default. A currency crisis that is triggered by curreny overvaluation could cause severe balance sheet effects, in the case that important part of the debt is denominated in foreign currency (Manasse and Roubini, 2005).

Manasse and Roubini (2005) concluded that unconditional thresholds such as debt-output ratios have little value by themselves to explain the probability of default. A country with a high debt-output ratio may have extremely small probability of default while another country with a moderate debt-output ratio could suffer a severe default threat. This reflects the case of combined effects on sovereign default distress, such as short-maturity, political uncertainty, and comparatively fixed ex-

change rates (which make a solvency crisis more probable while resulting in only a liquidity crisis in a flexible exchange rate country).

Developing countries usually have some additional problems with respect to sovereign debt, including ‘‘currency mismatches’’, ‘‘debt intolerance’’, and ‘‘original sin’’. Debt intolerance is and interesting and important situation. While we all would expect an emerging country with a ratio of GNP above 150 percent have a considerable risk of default, Japan is not having any problems with debt-to-GDP ratio at 120 percent (Reinhart, Rogoff and Savastano, 2003:14). To make it more clear, it should be considered that Mexico’s 1982 debt crisis occurred at a ratio of external debt of 47 percent, and 2001 Argentine default happened at an external debt-to-GDP ratio slightly above 50 percent.

Another interesting point is ‘‘safe’’ external debt-to-GNP thresholds are low for some countries which have an infamous default and inflation history (Reinhart, Rogoff and Savastano, 2003:2). The basic deficiencies of debt intolerant country economies are weak fiscal structures and weak financial systems (Reinhart, Rogoff and Savastano, 2003:3). Some countries have also defaulted, de facto, on their internal obligations through high inflation or hyperinflation.

Discrimination among sovereign issuers as well as fiscal vulnerabilities leading to default risk concerns, may be a reflection of considerations about the relative liquidity of different government bond markets. Amidst financial turmoil, a flight to safety and liquidity resulted in a decline in the yields of the most liquid sovereign bond markets (e.g. benchmark Bunds) (Sgherri and Zoli, 2009:3).

Government exposure to weakness in the financial sector (mainly by committing large resources to guarantee financial institutions) also becomes a factor in ex-

plaining sovereign spreads in the euro area, after the financial crisis of 2008 (Sgherri and Zoli, 2009:4).

PIIGS, denoting Portugal, Ireland, Italy, Greece, and Spain altogether, becomes a popular abbreviation for the countries suffering sovereign debt crises following the financial crisis of 2008.

In Europe, sovereign debt crises started with Greece and spread to Ireland, Portugal, Spain and Italy. The sovereign debt crisis in Europe still goes on (Darvas et al., 2011:2). In the last three years, adjustment has started in these countries and major policy measures have been taken. Results are already visible in Ireland (Darvas et al., 2011:4).

Crisis mechanisms have been set up by the EU in the form of EFSM (the European Financial Stability Mechanism) and financial assistance has been provided to the crisis countries. And the European Central Bank (ECB) has embarked on a (controversial) peripheral sovereign debt purchase programme, while continuing its earlier support to euroarea banks with ample liquidity provision (Darvas et al., 2011:2).

Gross debt-to-GDP ratios increase across all EMU countries during 2007-2011, but with different magnitudes. The increases in Ireland (62.3%), Greece (38.2%), and Spain (36.3%) are the largest causing several debt rating downgrades and, in the case of Greece, Ireland and Portugal even an inability to borrow on the financial markets (Grammatikos and Vermeulen, 2012:5).

Since late 2009, there is an apparent differentiation in terms of CDS spreads between countries who suffer sovereign debt crises and who do not, for instance as CDS spreads for some countries following Germany has been falling, a group of crisis countries following Greece has been having skyrocketing CDS spreads (Grammatikos and Vermeulen, 2012:5).

The aim of this study is to investigate the stages of a sovereign debt crisis and determine the major indicators of a debt crisis for major developed and emerging market countries over the period 1993-2011. We would like to see the effect and also the magnitude of the effect of major economic indicators on sovereign debt default. To assess the differentiation of effect and the differentiation in the magnitude of the effect of these indicators between developed, emerging and European countries with default risk are aimed by the analysis in this study. This study, as it covers the data of the recent years, will also help get the latest importance of specific economic indicators following the onset of the financial crisis and the subsequent infamous European sovereign debt crisis. Assessing the differentiation in importance of economic indicators with respect to sovereign debt default, will allow to produce specific economic policies to avert sovereign debt crises in different types of countries.This study is organized as follows: Chapter 2 summarizes the sovereign debt crises of the past two decades. Chapter 3 is a review of the literature. Chapter 4 identifies methodology and data used in the study. Chapter 5 presents empirical findings. Chapter 6 discusses the author's refinements, the main conclusions of the analysis and related policy implications.

CHAPTER 2: SOVEREIGN DEBT CRISES IN THE PAST TWO DECADES

Sovereign debt, which is often called external debt, is debt guaranteed by a particular government. So as to raise money, a government will issue bonds in a currency that is not the government's and sells those bonds to foreign investors. This is what makes the debt external: purchasers are from outside the country. The currency chosen for the sovereign debt is usually a strong one, whose value is higher than other currencies. Bonds, by their nature, are instruments of debt to be paid back at a certain time that can be as long as ten years or as short as one year, with the original investment plus interest. Bonds issued by a government in a foreign currency are called sovereign bonds.

The money collected by the sale of the bonds can be used in any manner the issuing government wants. For instance, the funds can be used to spur job growth with spending on infrastructure projects. A government could also give the money to private companies or banks.

It's important to note, sovereign debt is technically owed by a government and not the citizens of the country issuing the sovereign bonds. It's not the national debt. However, in order to pay the sovereign debts, the government has to come up with the money in the foreign currency in which it sold the bonds. To get that money, the country could divert funds from internal spending, increase taxes, and/or induce cutbacks in social programs such as pensions.

Though, an interesting question arises: What happens if a country defaults on its sovereign debt?

That a country may not be able to pay the foreign investors who bought sovereign bonds of this country is an issue of risk, in the sense that it has happened in the past. Recent examples are Russia, which defaulted on its sovereign debt in 1998, and Argentina in 2002.

This usually happens when a new government takes power and refuses to pay the sovereign debt, or simply when the country does not have the money to pay when the debt is due. In most cases, the only recourse for the lender is to renegotiate the terms of the loan since it cannot seize the government's assets. When a country is unable to pay its sovereign debt, the loans are rescheduled for later payment or restructured at better interest rates for the country owing the debt. Indeed, a default would hurt a country's chances of obtaining a loan in the future. Its credit rating would also be hurt, making it more expensive for the country to sell sovereign debt bonds in the future.

Also, investors might not want to invest in a country that's not able to pay its sovereign debt, leaving the country with fewer funds for economic growth.

Sovereign debt defaults can send stock and bond markets around the world into a frenzy. Confidence in the markets can suffer when a country defaults, depending on the size of the default. Investors don't get their money back or have to take reduced rates on their investments. Often, the countries that own the debt might pledge funds to help the debt-ridden country survive any type of economic collapse.

Sovereign defaults, just like sovereign debt, are pretty old phenomena. Portugal has defaulted four times on its external debt obligations since the late 1800s. So far, Greece has defaulted five times in the same time span. Spain has defaulted six times, with the last occurrence in the 1870s. We mentioned recent examples of Russia and Argentina above. However, there are a number of countries that have clean

records of paying on sovereign debt obligations and have never defaulted. These include the U.S., Canada, Denmark, Belgium, Finland, Malaysia, Mauritius, New Zealand, Norway, Singapore, Switzerland and England[1].

From 1970 to 2006, all of the 74 (external and internal) sovereign default episodes occurred in emerging market economies (EMEs) (Gourinchas and Obstfeld, 2011:8), also see Table 1. Yet, after the Financial Crises of 2008 several euro zone countries including Greece, Italy, Portugal, Spain and Ireland etc. are on this list of countries who have a risk to default. S&P downgraded U.S. rating in 2011 resulting in country's losing its triple-A status, and also downgraded nine of the major European countries including France and Austria in January 2012, which meant these two European countries also lost their triple-A ratings[2]. Therefore, in the first part of the Chapter 2 the debt crises in emerging markets is analyzed and the second part focuses on the debt crises of developed countries.

Table 1. Crisis Incidence in Advanced and Emerging Economies, 1970-2006

	Currency	Banking	Default	# of Countries
Advanced	43	5	0	22
Emerging	84	57	74	57
Total	12	62	74	79

Source: Gourinchas and Obstfeld (2011)

All of the major crises in the past two decades have not necessarily ended up with sovereign default. Besides, most people are sure that without IMF packages and international assistance, most of the countries who suffered a so-called twin crisis (a banking and currency crises together) and large fiscal deficits would have ended up with a sovereign default.

[1]Source:CNBC(2011). ''Sovereign Debt: Cnbc E xplains'',http://www.cnbc.com/id/44771099/Sovereign_Debt_CNBC_Explains,14.11.2011

[2] Source: Reuters (2012). S&P downgrades nine euro zone countries, http://www.reuters.com/article/2012/01/14/us-eurozone-sp-idUSTRE80C1BC20120114, 14.01.2012

A great increase in the number and value of bonds issued by emerging-market borrowers is observed in 1990s, which were a dominant source of capital for developing countries and had significant implications for the operation of international capital markets. The value of the bonds issued by developing countries were in negligible levels in the 1980s (less than $3.5 billion in 1989), then it rose to $24 billion in 1992 (more than $50 billion per annum in 1993-95), an unprecedented $102 billion in 1996, and even higher levels in 1997. Despite the fact that equity issues were the subject of much attention, they never reached comparable levels, see table 2 (Eichengreen and Mody, 1998:1). Sovereign debt, while sometimes leading to international lending problems, became the largest asset class in emerging markets, by the year 2009 (Jeanneret, 2009:2).

Table 2. Bond Issues, Equity Issues and Syndicated Loans to Emerging Markets (Gross, USD billions)

	1991	1992	1993	1994	1995	1996	1997 Q1
Portfolio equity	5.6	7.2	11.9	18.0	11.2	16.4	3.2
Bonds	13.9	24.3	62.7	56.5	57.6	101.9	27.7
Western Hemisphere	7.1	12.9	28.8	18.0	23.1	47.1	11.9
Asia	4.1	5.9	22.0	29.9	25.3	43.1	12.7
Europe and Central Asia	2.1	4.8	9.7	3.5	6.6	7.4	2.8
Middle East	0.4	0	2.5	3.0	0.7	2.6	0.3
Africa	0.3	0.7	0.2	2.1	1.9	1.6	0
Syndicated loan commitments	50.7	42.5	43	55.1	74.9	79.7	21.3
Short-term commitments	5.2	8.2	11.9	14.3	21.6	30.5	7.4
Total	75.4	82.4	129.5	144.0	165.3	228.5	59.6

Source: IMF (1997) (Eichengreen and Mody, 1998:1)

Through the past two decades, we witnessed sovereign debt-servicing difficulties and outright defaults as common issues. But, alas, neither the macroeconomic misalign-

ments causing debt crises are well-understood, nor enough work has been done on predicting debt crises (Manasse, Roubini and Schimmelphennig, 2003).

The phenomenon of the vicious cycle in terms of sovereign debt crises is summarized by two interesting columns from the press with an old date:

"Serious financial institutions are buying billions of dollars of long-term bonds from countries that five years ago were regarded as economic disaster areas. Moreover, they have been buying them at razor-thin margins over US Treasury bond yields." (Financial Times, 10 July 1997) (Kamin and Kleist, 1999:4).

"There is a big demand for spread because we are in another era of high global liquidity and low interest rates," says Sylvia Maxfield, sovereign analyst at Lehman Brothers Inc. in New York. (Wall Street Journal, 6 May 1997) (Kamin and Kleist, 1999:4).

Despite the fact that the 1980s is an infamous decade of debt crises, sovereign defaults have even more frequently repeated after 1980s. On the one hand countries such as Russia, Ecuador, Argentina have suffered episodes of outright defaults; on the other hand, in some cases formal default was avoided via a debt restructuring under a coercive threat of default as in Ukraine, Pakistan and Uruguay, and in some cases default was circumvented by large scale IMF financial support as in Mexico, Brazil and Turkey (Manasse and Roubini, 2005: 3). In the absence of the enormous bailout packages that were put together by the international community, there would not be so much doubt that those currency crises in Mexico, South Korea, Thailand and Turkey would have all suffered a sovereign debt default (Reinhart, 2002:3). Manasse and Roubini (2005) also suggest that solvent but illiquid countries with large amounts of short-term debt may also need IMF support to avoid a liquidity run or

‘‘roll-off’’ crisis. As a result, to estimate a liquidity crisis, short-term debt to reserves ratio is an important criterion.

Short-term debt of emerging markets on the maturity composition of their external debt has increased from 14 percent to approximately 22 percent during the 1970-2009 era. In line with Diamond and Dybvig’s (1983) famous model of banking crises, ‘‘short-term debts escalate on the eve of banking crisis’’; the ratio of short-term to total debt about doubles from 12 to 24 percent on the eve of the banking crisis of the 1980s. A similar pattern emerges in the runup to sovereign defaults (which in this particular exercise immediately follows banking crises). Many individual crises episodes are equally, or possibly even more compelling such as Indonesia’s (Reinhart and Rogoff, 2010b:28).

Reasons For Sovereign Debt Crises

Countries with high amount of sovereign debt may face a debt crisis unless there is a strong and credible fiscal consolidation. Manasse and Roubini (2005) suggest that all sovereign debt crises are not the same with respect to whether government faces insolvency, illiquidity, or various macroeconomic risks.

Thus, three major types of risks in terms of sovereign debt are identified: solvency (or debt unsustainability), illiquidity, and macroexchange rate risks.

Solvency: Manasse and Roubini (2005) define it as debt unsustainability risk types when external debt exceeds 49.7 percent of GDP, accompanied with monetary or fiscal imbalances as well as external financing needs that reflect illiquidity (Manasse and Roubini, 2005:4).

Illiquidity: Liquidity risk types categorize countries with moderate debt levels yet having a caveat of short-term debt in excess of 130 percent of reserves, together with political uncertainty and tight global liquidity (Manasse and Roubini, 2005:4).

Macroexchange rate risks:

The combination of low growth and comparatively fixed exchange rates classifies macroexchange rate risk types (Manasse and Roubini, 2005:4).

According to Manasse and Roubini (2005), a relatively ‘‘safe’’ country type is thus described by the combination of these prerequisites: low external debt (below 49.7 percent of GDP), low short-term debt (below 130 percent of reserves), low public external debt (below 214 percent of fiscal revenue), and an exchange rate that is not excessively overappreciated (overvaluation below 48 percent).

Solvency and liquidity are separate cases with regard to external public debt. On the one hand, in case of insolvency, the stock of debt is regarded as too large to be sustained in the long-run; on the other hand illquidity defines situations when (even at moderate debt levels) a rollover of maturing debt is considered impossible.

In principle, default is a two-sided phenomenon. While a country may not be eager to repay its debt, considering the relative costs and benefits of a default; another country may really be unable to repay its debt since it is either insolvent or illiquid (Manasse and Roubini, 2005:5).

Indeed, not only default but also a debt distress can also be regarded as a sovereign debt crisis. Sy (2003) finds that a particular sovereign debtor suffers distress periods when access to international capital markets is intensely reduced and cost of capital is preclusively high. Moreover, sustainability issues become more severe at distressed-spreads levels. He also finds that distress corresponds to prolonged events that can last between three months and nine quarters (Sy, 2003:6).

Table 3 identifies the major rating agencies' characterization of debt and issuer, related ratings and their linear transformation.

Table 3. S&P, Moody's and Fitch Rating Systems and Linear Transformations

Characterization of debt and issuer (source: Moody's)	Rating			Linear transformation
	S&P	Moody's	Fitch	
Highest quality	AAA	Aaa	AAA	17
High quality	AA+	Aa1	AA+	16
	AA	Aa2	AA	15
	AA-	Aa3	AA-	14
Strong payment capacity	A+	A1	A+	13
	A	A2	A	12
	A-	A3	A-	11
Adequate payment capacity	BBB+	Baa1	BBB+	10
	BBB	Baa2	BBB	9
	BBB-	Baa3	BBB-	8
Likely to fulfill obligations, ongoing uncertainty	BB+	Ba1	BB+	7
	BB	Ba2	BB	6
	BB-	Ba3	BB-	5

Table 3. Continued

High credit risk	B+	B1	B+	4
	B	B2	B	3
	B-	B3	B-	2
Very high credit risk	CCC+	Caa1	CCC+	1
	CCC	Caa2	CCC	
	CCC-	Caa3	CCC-	
Near default with recovery possibility	CC	Ca	CC	
			C	
Default	SD	C	DDD	
	D		DD	
			D	

Source: Afonso and Gomes (2010:4)

That the rating agencies give more emphasis to different variables is also a possible observation. For instance, Moody's give more emphasis to the government deficit, whereas S&P and Fitch focus more in government debt (Afonso and Gomes, 2010:7).

In the table 4, a list of the ratings for major sovereigns by 2012, June 3 is introduced:

Table 4. A List of the Ratings For Major Sovereigns by 2012, June 3

Country	Local Currency Rating	Foreign Currency Rating
Argentina	B	B
Australia	AAA	AAA
Austria	AA+	AA+

Table 4. Continued

Belgium	AA	AA
Brazil	A-	BBB
Bulgaria	BBB	BBB
Canada	AAA	AAA
Chile	AA	A+
China	A-	AA-
Colombia	BBB+	BBB-
Croatia	BBB-	BBB-
Cyprus	BB+	BB+
Czech Republic	AA	AA-
Denmark	AAA	AAA
Ecuador	B-	B-
Egypt	B	B
Estonia	AA-	AA-
Finland	AAA	AAA
France	AA+	AA+
Germany	AAA	AAA
Greece	CCC	CCC
Hong Kong	AAA	AAA
Hungary	BB+	BB+
Iceland	BBB-	BBB-
India	BBB-	BBB-

Table 4. Contiuned

Indonesia	BB+	BB+
Ireland	BBB+	BBB+
Israel	AA-	A+
Italy	BBB+	BBB+
Japan	AA-	AA-
Kazakhstan	BBB+	BBB+
Korea	A+	A
Latvia	BBB-	BBB-
Lithuania	BBB	BBB
Luxembourg	AAA	AAA
Malaysia	A	A-
Malta	A-	A-
Mexico	A-	BBB
Netherlands	AAA	AAA
New Zealand	AA+	AA
Norway	AAA	AAA
Pakistan	B-	B-
Philippines	BB+	BB
Poland	A	A-
Portugal	BB	BB
Russian Fed.	BBB+	BBB
Saudi Arabia	AA-	AA-

Table 4. Contiued

Slovak Republic	A	A
Slovenia	A+	A+
South Africa	A	BBB+
Spain	BBB+	BBB+
Sweden	AAA	AAA
Switzerland	AAA	AAA
Taiwan	AA-	AA-
Thailand	A-	BBB+
Turkey	BBB-	BB
Ukraine	B+	B+
United Kingdom	AAA	AAA
U.S.	AA+	AA+
Uruguay	BBB-	BBB-
Vietnam	BB-	BB-

Source: Standard & Poor's (2012),http://www.standardandpoors.com/ratings/sovereigns/ratings-list/en/us/?subSectorCode=39&start=100&range=50

From the table above, it can be understood that PIIGS (Portugal, Ireland, Italy, Greece and Spain) have lower ratings than other major European countries, as a result of their sovereign debt crises. And also, the decoupling of rating grades between countries from North Europe and the ones from South Europe are very significant.

Lower ratings also lead systematically higher spreads, as can be seen from the table below. The only exceptions are lower average spreads of AA countries than

AA+ countries, lower average spreads of BBB- countries than BBB countries, in the 1996-2009 period.

Table 5: Average Yield Spread of Government Bonds Over Sovereign AAA Bonds (1996-2009)

Rating	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-
Basis Points	0	8	3	29	71	100	159	275	312	297

Source: Afonso and Gomes (2010:22)[3]

Sy (2003) suggests that credit ratings predict debt crises but is not successful in anticipating currency crises after 1994. Also, lagged ratings and ratings changes, including negative outlooks and credit watches, anticipate such debt crises (Sy, 2003). Goldstein, Kaminsky and Reinhart (2000) find that sovereign ratings fail to predict banking and currency crises and are instead adjusted ex post.

In practice, a strong link between currency crises and default in emerging market economies exists (Detragiache and Spilimbergo, 2001). Since the stock of debt can sharply increase in real terms after a large currency crisis, a currency crisis triggered by overvaluation can cause severe balance sheet effects if a large part of the debt is foreign currency denominated (Roubini and Manasse, 2005).

Following the Asian financial crises in 1997, external illiquidity was held responsible for the problems, leading many observers to call for limits to short-term exposures by emerging markets. Tests to assess whether illiquidity is correlated with crises are misleading since they ignore that vulnerability itself can force a country to borrow at short maturity, in line with the suggestions by the theoretical models of Diamond and Rajan (2000) and Jeanne (2001). Detragiache and Spilimbergo (2001)

[3] Countries included Belgium, Germany, Ireland, Greece, Spain, France, Italy, Netherlands, Austria, Portugal, Finland, Malta, Denmark, United Kingdom, Bulgaria, Czech Republic, Hungary, Latvia, Poland, Sweden. United States, and Canada.

stated that casuality runs from vulnerability to short-term debt, but not the other way around (Detragiache and Spilimbergo, 2001:1).

Outright defaults on domestic and/or external debt are witnessed in Russia, Ecuador and Argentina. In addition, under the implicit threat of default, episodes of semi-coercive restructuring of sovereign debt are observed in Ukraine in 2000, Pakistan in 1999, and Uruguay in 2003. We observed other episodes where the country was most likely solvent but illiquid and a debt-servicing crisis was prevented via large sums of official support by the international financial institutions, as well as less coercive form of private sector involvement in crisis resolution (Mexico in 1994-95, Korea and Thailand in 1997-98, Brazil in 1999 and 2002, Turkey in 2001, and Uruguay in 2002). In many of the latter episodes, one of the sources of debt servicing difficulties was the short-term maturities of external or domestic debt obligations of the sovereign or of the private sector (the private banks in Korea for example), rather than excessive debt associated with a clear insolvency situation. (Manasse, Roubini and Schimmelphennig, 2003:4)

Table 6. Moody's Rated Sovereign Bond Defaults since 1983

Default Date	Country	Total Defaulted Debt (USD billions)	Comments
July 1998	Venezuela	USD 270	Defaulted on domestic currency bonds in 1998, although the default was cured within a short period of time.

Table 6. Continued

August 1998	Russia	USD 72,709	Missed payments first on local currency Treasury obligations. Later a debt service moratorium was extended to foreign currency obligations issued in Russia but mostly held by foreign investors. Subsequently, failed to pay principal on MINFIN III foreign currency bonds. Debts were restructured in August 1998 and February 2000.
September 1998	Ukraine	USD 1,271	Moratorium on debt service for bearer bonds owned by anonymous entities. Only those entities willing to identify themselves and convert to local currency accounts were eligible for debt repayments, which amounted to a distressed exchange.
July 1999	Pakistan	USD 1,627	Pakistan defaulted and resolved that default via a distressed exchange which was completed in 1999.

Table 6. Continued

August 1999	Ecuador	USD 6,604	Missed payment was followed by a distressed exchange; over 90% of bonds were restructured.
January 2000	Ukraine	USD 1,064	Defaulted on DM-denominated Eurobonds in February 2000 and defaulted on USD-denominated bonds in January 2000. Offered to exchange bonds with longer term and lower coupon. The conversion was accepted by a majority of bondholders.
September 2000	Peru	USD 4,870	Peru missed payment on its Brady Bonds but subsequently paid approximately USD 80 million in interest payments to cure the default, within a 30-day period.
November 2001	Argentina	USD 82,268	Declared it would miss payment on foreign debt in November 2001. Actual payment missed on January 3, 2002. Debt was restructured through a distressed exchange offering where the bondholders received haircuts of approximately 70%.

Table 6. Continued

June 2002	Moldova	USD 145	Missed payment on the bond in June 2001 but cured default shortly thereafter. Afterwards, it began gradually buying back its bonds, but in June 2002, after having bought back about 50% of its bonds, it defaulted again on remaining USD 70 million of its outstanding issue.
May 2003	Uruguay	USD 5,744	Contagion from Argentina debt crisis in 2001 led to a currency crisis in Uruguay. To restore debt-sustainability, Uruguay completed a distressed exchange with bondholders that led to extension of maturity by five years.
April 2005	Dominican Republic	USD 1,622	After several grace period defaults (missed payments cured within the grace period), the country executed an exchange offer in which old bonds were swapped for new bonds with a five-year maturity extension, but the same coupon and principal.

Table 6. Continued

December 2006	Belize	USD 242	Belize announced a distressed exchange of its external bonds for new bonds due in 2029 with a face value of USD 546.8. The new bonds are denominated in U.S. dollars and provide for step-up coupons that have been set at 4.25% per annum for the first three years after issuance.
December 2008	Ecuador	USD 3,210	In November 2008, Ecuador missed an interest payment of USD 30.6 million on its USD 510 million of 12% global bonds due in 2012. Additionally, a USD 135 million interest payment on the 2030 global bonds (USD 2.7 billion) was missed in February 2009.

Source: Moody's (2009:8)

Countries might be unable to repay their debt because they are either insolvent or illiquid. Whether a sovereign is insolvent or not depends on its stock of debt relative to its ability to pay, measured, for example, by GDP, exports, or government revenues. ''A sovereign is solvent if the discounted value of future primary balances is greater or equal to the current public debt stock''. In a similar fashion, a country is solvent provided that the discounted value of future trade balances is more than the

current stock of external debt. A debt crisis can also occur if a country is illiquid rather than insolvent. Hence, liquidity measures, such as short-term debt to reserves or M2 to reserves, are included in some models. Finally, institutional and political factors affect policy credibility, as well as a government's willingness to pursue policies consistent with a sustainable debt path. (Manasse, Roubini and Schimmel-phennig, 2003:6)

Dell'Ariccia, Schnabel and Zettelmeyer (2002) find that spreads increased after the nonbailout of Russia in 1998, suggesting that spreads are compressed by moral hazard. The role of international financial rescue operations in causing moral hazard, resulting in overinvestment or insufficient monitoring by investors, bad policies on the side of governments, or both- has been at the center of debate ever since the 1995 Mexican bail-out. Participants in this debate disagree about the extent to which this type of moral hazard has caused problems in the past, with views ranging from the belief that the Mexican rescue caused the Asian crisis to the idea that moral hazard due to the expectation of international crisis lending is an isolated phenomenon associated with particular large borrowers (Dell'Ariccia, Schnabel and Zettelmeyer, 2002:2). It is significant that generous bail-out for Mexico, resulted in an overinvestment and underpricing of risk before the Asian Crisis in which the crisis countries have similar problems before the incident, with pre-1994 crisis Mexico.

Whether the determinants of ratings are the ''right'' set of fundamentals when it comes to predict financial crises is a key question asked by GKR (2000). Sy (2003) results suggest that there may be variables, other than macroeconomic fundamentals, at play in the relationship between currency crises and the likelihood of sovereign default which should merit further attention (Sy, 2003:11)

Thus if credit ratings are forward-looking and currency crises in emerging market economies are linked to defaults, it means that downgrades should systematically precede currency crises (Reinhart, 2002:2).

The analysis of Manasse and Roubini (2005) stresses debt sustainability analysis: Unconditional thresholds (for example, debt-output ratios) are shown to have little value by themselves for assessing the probability of default. A heavily indebted country may have a negligible probability of default while another country with moderate values of debt ratios may run a considerable default risk. This interesting situation reflects the combined effects of short maturity, political uncertainty, and relatively fixed (rigid) exchange rates, which allows a liquidity crisis in the latter country with a moderate debt-output ratio to be more likely than a solvency crisis in the former.

In contrast to developed countries, emerging countries generally have some additional problems in terms of sovereign debt such as ‘‘currency mismatches’’, ‘‘debt intolerance’’, and ‘‘original sin’’. As described by Eichengreen, Hausman and Panizza (2003); currency mismatches defines differences in the currencies in which assets and liabilities are denominated, debt intolerance is identified as the inability of emerging markets to manage the levels of debt that are manageable for advanced industrial countries, and original sin is the difficulty which emerging countries suffer when attempting to borrow abroad in their own currencies.

As suitable with the ‘‘debt intolerance’’ concept, few macroeconomists would be surprised to learn that emerging market economies with ratios of external debt to GNP above 150 percent run a significant risk of default. After all, among advanced economies, Japan’s current debt-to-GDP ratio, at 120 percent, is almost universally considered high. Yet default can and does occur at ratios of external debt

to GNP that would not be considered "excessive" for the typical advanced economy: to give an example, Mexico's 1982 debt crisis occurred at a ratio of external debt to GNP of 47 percent, and Argentina's 2001 crisis at a ratio slightly above 50 percent (Reinhart, Rogoff and Savastano, 2003, 14). This is particularly due to large external debt burden which goes together with monetary stability, a large current account surplus, and sound public finances (Roubini and Manasse, 2005). Yet, as for debt-intolerant emerging country economies, Mexico and Argentina are not the exceptional cases.

Table 7. Seven Heavily Indebted Countries: Ratios of Public Debt to GDP, 1976-1981 (percent)

	1976	1977	1978	1979	1980	1981
Argentina	15.0	18.0	18.7	20.1	21.3	29.6
Brazil	19.8	20.9	21.3	22.2	28.5	30.1
Chile	36.1	26.5	30.1	26.8	21.5	18.8
Mexico	22.0	31.4	32.2	30.8	29.1	34.3
Nigeria	3.9	5.8	9.4	12.2	13.9	16.9
Philippines	31.0	33.8	36.8	35.5	34.6	36.3
Venezuela	11.7	17.2	28.6	35.2	36.3	40.0

Source: Guidotti and Kumar 1991. (Montiel 152)

Many other countries which also suffered default or restructuring between 1970 and 2001 had an external debt below 50 percent of GNP at the time of these adverse credit events (Reinhart, Rogoff and Savastano, 2003:15).

Table 8. Public Sector Debts and Deficits (-) 2011, % of GDP

	1976	1977	1978	1979	1980	1981
Argentina	15.0	18.0	18.7	20.1	21.3	29.6
Brazil	19.8	20.9	21.3	22.2	28.5	30.1
Chile	36.1	26.5	30.1	26.8	21.5	18.8
Mexico	22.0	31.4	32.2	30.8	29.1	34.3
Nigeria	3.9	5.8	9.4	12.2	13.9	16.9
Philippines	31.0	33.8	36.8	35.5	34.6	36.3
Venezuela	11.7	17.2	28.6	35.2	36.3	40.0

Source: AMECO Forecasts and Financial Times (Grahl, 2012:10)

As we can conclude from the table, the public debt to GDP ratios are very low compared to their current levels, even in countries that had faced debt crises at the time.

Reinhart, Rogoff and Savastano (2003) point that fully half of all defaults from 1970 to 2003 took place in countries having ratios of external debt to GNP below 60 percent (Reinhart, Rogoff and Savastano, 2003:5). They argue that ‘‘safe’’ external debt-to-GNP thresholds are low for some countries, depending on a country’s default and inflation history. When it comes to forecast a country’s ability to maintain its solvency in the cases of moderate to high levels of indebtedness for many years into the future for both domestic and external debt, it’s not independent from that country’s record at meeting its debt obligations and managing its macroeconomy. Weak fiscal structures and weak financial systems are some of the major deficiencies in debt-intolerant countries’ economies (Reinhart, Rogoff and Savastano (2003:3).

With respect to a comparison of the external indebtedness profiles of emerging market economies with or without a history of default, over the period 1970-2000, we observe that frequency distribution of the external debt-to-GNP ratios are very distinct between these two groups of countries. Those countries that risk default the most (those with greatest debt intolerance) also borrow the most, compared to that a lactose-intolerant individual was addicted to milk. This process creates so many capital flow cycles and ends in an ugly credit event (Reinhart, Rogoff and Savastano, 2003). They emphasize total external debt scaled by GNP as one of the major components of their debt intolerance measure since most government debt in emerging markets until the late 1980s was external, and external debt that was private before a crisis often becomes public after the fact (Reinhart, Rogoff and Savastano, 2003:21). If a debt-intolerant country’s external debt rises, it may suddenly be

shut out of international capital markets to suffer a debt-crisis (Reinhart, Rogoff and Savastano, 2003:3).

Turkey, for instance, has defaulted six times over the past 175 years. Some emerging countries, including Turkey, have at times also defaulted, *de facto*, on their internal obligations via high inflation or hyperinflation (Reinhart, Rogoff and Savastano, 2003:8).

Here arises an interesting question: If serial default is such a common phenomenon, why do markets repeatedly lend to debt-intolerant countries to the point where the risk of a credit event –a default or a restructuring- becomes significant? The procyclical nature of capital markets is part of the reason in the context that capital markets have repeatedly lent vast sums to emerging market economies in boom periods (which are often associated with low returns in the industrial countries) only to retrench when adverse shocks occur, producing painful ‘‘sudden stops’’ (Reinhart, Rogoff and Savastano, 2003:7). Some kind of a boom period started to emerge after the Financial Crisis of 2008, associated with extremely low returns in industrial countries, creating a capital inflow to emerging countries to allow emerging countries to borrow more from capital markets very easily.

Between 2007 and 2009, for the five countries with systemic financial crises (Iceland, Ireland, Spain, the United Kingdom, and the United States), average debt levels increased by about 75 percent. Even in countries that have not experienced a major financial crisis, debt rose an average of about 20 percent in real terms between 2007 and 2009 (Rogoff and Reinhart, 2010).

The reasons for this temporal sequence may be the contingent liability story emphasized by Diaz Alejandro (1985) and formalized in Velasco (1986), in which the government takes on massive debts from the private banks, thus undermining its

own solvency. The currency crashes that are an integral part of the "twin crisis" phenomenon documented by Kaminsky and Reinhart (1999) would also be consistent with this temporal pattern. If, as they suggest, banking crises precede currency crashes, the collapsing value of the domestic currency that comes after the banking crisis begins may undermine the solvency of both private and sovereign borrower who are unfortunate enough to have important amounts of foreign currency debts (Reinhart and Rogoff, 2010b:25-26).

Emerging markets crises in the past two decades as well as debt crises of developed countries from 2008 onwards, are crucial to outline when examining the determinants of debt distress. As for emerging markets crises of the past two decades, Mexico, the Asian crisis countries, Russia, Brazil, Turkey and Argentina are among the most important developing countries to examine their crises that they suffered. The debt crises of the developed countries following the 2008 financial crisis includes countries such as Portugal, Ireland, Italy, Greece, Spain, the United States, France, Iceland and Japan.

Debt Crises in Emerging Markets

At the end of the past millennium, financial crises have been a common occurrence in emerging market (and transition) countries with devastating consequences for their economies. For instance, the financial crises that struck Mexico in 1994 and the East Asian countries in 1997 led to a fall in the GDP on the order of ten percentage points. The financial crises in Russia in 1998 and Ecuador in 1999 have had similar negative effects on real output. These crises led to sharp increases in poverty as well as political instability (Mishkin, 2001:1).

1990s is an era that a sequence of emerging markets crises occurred one by one. The first major emerging markets crisis in 1990s is Mexican Crisis of 1994 (or the so-called ‘‘Tequila Crisis’’). The one of the immediate reasons for the Mexican Crisis of 1994 is heavy short-term domestic debt burden tied to U.S. dollars. A vast amount of international support had prevented a probable sovereign default in the Mexican Crisis of 1994.

The next wave of crises happened in the Asia. Encouraged by exchange rate overvaluation and relatively rigid exchange rates, a series of severe devaluations took place in Asia, following the devaluation of Thai Baht in July 1997. That no Asian Crisis country ended up with a sovereign default or a bond restructuring, is a consequence of that the roots of the crises are not in excessive public borrowing. The solvency of the sovereigns, therefore, was not questioned.

A debt crisis occurred in Russia in 1998, creating contagion effects for Brazil and Turkey and also to some extent to Argentina. The Russian Crisis of 1998 was mainly a product of plummeting real GDP and huge fiscal deficits after the economic reforms following the Communist era. This led to an accumulation of huge debt burden for the country, especially with short-term maturity. The contagion effects of Asian Crisis and decreasing energy prices which led to deterioration in the current account are other major factors for the crisis. The government, as an unavoidable result, declared a moratorium on all public ruble debt and part of the foreign liabilities, while also devaluing the currency.

Brazil and Turkey faced relatively similar situations following the Asian and Russian crises. Deteriorating external economic conditions as well as current deficits as a result of relatively rigid exchange rate regimes (crawling peg in the case of Brazil and currency anchor in the case of Turkey), and a lack of fiscal discipline resulted

in deterioration in international reserves and devaluation in local currency in 1999 in Brazil and in 2001 in Turkey.

Besides, the Argentine Crisis of 2001 is a typical sovereign debt crisis which ended up with a sovereign default, in which the main reason is a dollar-peso vis-à-vis (by creating international resevers shortages and huge capital outflows) following the initiation of the currency board regime in 1991.

In the following part, some of the severe economic and financial crises that emerging countries have suffered will be summarized.

Mexico 1994-1995

The Mexican Crisis 1994-1995 was the first emerging crisis to result from both current and capital account deficits. Referring to this situation, Michel Camdessus, IMF Managing Director of the time, branded the crisis as ‘‘the first of the twenty-first century’’. This crisis is called ‘‘Peso Crisis’’, ‘‘Tequila Crisis’’ (with an allusion to the consequences in the region) and ‘‘Tesebono Crisis’’ which most accurately summarizes the crisis’ roots referring to the unsustainable burden of short-term domestic notes linked to the U.S. dollars. The collapse of short-term debt is a product of the political turbulences in the election year (Andritzky, 2006:28).

The Mexican liquidity crisis in 1994-1995 was averted by generous international support, preventing a precedence for a ‘‘modern’’ sovereign default from happening (Andritzky, 2006:41).

Feldstein (2002) suggests that another primary cause of Mexican Crisis of 1994 is a large and growing current account deficit caused by a fixed exchange rate.

The Mexican crisis 1994-1995 was the first emerging market crisis stemming from both current and capital account deficits. Due to this fact, Michel Camdessus,

IMF Managing Director of the time defined the crisis as ‘‘first of the twenty-first century’’. In addition to ‘‘Peso Crisis’’ and ‘‘Tequila Crisis’’ (referring its consequences in the region), it is most accurately called the ‘‘Tesobono Crisis’’, pointing to the crisis’ roots in the unsustainable burden of short-term domestic notes linked to the US dollar. The turbulent political circumstances in the election year led to the burst of short-term debt. The imcumbent government expanded its fiscal expenditures and missed a realignment of the currency, as a response. The peso peg which was introduced under the outgoing administration of Carlos Salinas, had contributed to low inflation and rapid economic growth. Yet, that the Mexican peso was overvalued and nurtured an economic bubble was widely acknowledged. Thanks to the peg, Mexico achieved to attract large portfolio flows which usually prove very volatile and quickly evaporate upon first signs of a crisis. By the end of 1993, the share of foreign investors is about 29% in all Mexican stocks and 79% in all bonds. In addition to this constellation, the country was facing a rollover of $30 billion of tesebonos in 1995 (Andritzky, 2006:28).

A run on peso started in November 1994 while the new government was not yet in office. The hefty short-term consequences of the crisis were associated with the sudden and unexpected meltdown in December 1994 when the peso was floated; therefore called the ‘‘December Mistake’’. This resulted in an immediate devaluation of about 50%, widespread uncertainty and distrust within the financial and corporate sector. In 1995, GDP contracted by 6% (Andritzky, 2006:28).

The large concerted assistance (totalling about $50 billion and presenting a large overrun of traditional support granted by the IMF) was accompanied by an unexpected quick policy response by the new Mexican government under Ernesto Zedillo. The aid package was widely criticized as pure bail-out, and U.S. was blamed

for promoting too much multilateral help to fixing problems in their backyard. The rescue effort (tailored to overcome a liquidity, not a solvency crisis) was, nevertheless, a stunning success. A collapse of the banking system which had accumulated non-performing debt in response to expansionary credit concessions, low interest rates, and insufficient bank supervision during the boom years, is prevented by an intervention among the recently privatized banks. Mainly due to the fact that solvency was not an issue, Mexico regained access to the international capital markets in 1996, avoiding a default or restructuring of its sovereign bonds. By 1997, the economy was booming. By 2006, the country is rated investment-grade (Andritzky, 2006:28).

Figure 1. Central Government Debt-to-GDP of Mexico (1990-2010)

The so-called Tequila crisis of 1994 leads to a jump in debt-to-GDP ratio of Mexico. Following the crisis, a relief in debt-to-GDP ratio observed. During the first decade of the 21st century until the liquidity crisis of 2007, along with most of the emerging countries Mexico enjoyed a comparatively considerable growth and high global liquidity, which allows a rise debt-to-GDP to be out-of-topic. The debt-to-

GDP ratio, again, started to increase after the liquidity crisis of 2007 and the financial crisis of 2008.

The Asian Crises 1996-1997

With the soared investor optimism and consequent increased worldwide capital flows into emerging markets after the quick and painless resolution of the Mexican crisis, the sequence of crises in Thailand, Indonesia, South Korea, and (to a lesser extent) Malaysia came as a major blow from behind for investors. Yet, the crises did not question the sovereigns' solvency because they did not have their seeds in excessive public borrowing. None of the countries affected ended up with a default or forced to a sovereign bond restructuring (Andritzky, 2006:29).

When Thailand's baht-dollar peg was put pressure by foreign exchange speculation in May 1997, it became the first country to come under pressure. The Thai government negotiated a moderate aid package of $17 billion which was later used mainly to restructure the banking sector, after it floated baht in July. ''Both banks and private corporations had large foreign debts from excessive investment flows into the ''Asian tigers''.'' Thai population suffered widespread economic difficulties caused by a wave of corporate bankruptcies. Yet, economy recovered rapidly by the help of a well implemented stabilization program (Andritzky, 2006:29).

The Thai banks' policy of borrowing dollars from abroad and then lending those dollars to Thai companies exacerbated the crisis in Thailand. Despite the fact that this strategy seemed to be a logical activity as long as the exchange rate between the Thai baht and the dollar was unchanged, it was actually very risky as the Thai businesses generally did not have the ability to earn dollars. Not surprisingly, the

Thai banks became unable to collect on their loans, when the Baht depreciated severely (Feldstein, 2002:11).

In 1997-1998, five East Asian countries (namely Indonesia, Malaysia, South Korea, the Philliphines, and Thailand) suffered severe currency and banking crises (Barro, 2001:2). The financial crisis that started in July 1997 in the East Asian countries (Thailand, Indonesia, Malaysia and Korea) had damaging effects on these economies. Growth rates in these countries plummeted from excess of 5% before 1997 to sharply negative in 1998 (Mishkin, 1999:1).

In 1998, GDP contractions are terrible in these countries, too. Real per capita GDP fell by 16% in Indonesia, 12% in Thailand, 10% in Malaysia, and 8% in South Korea, but only 3% in the Philippines. The other five east Asian economies that were relatively less affected (Hong Kong, Singapore, Japan, Taiwan and China), experienced per capita GDP growths of -5% (Hong Kong), -3% (Singapore), -1 (Japan), 4% (Taiwan) and 6% (China) (Barro, 2001:4).

Indonesia became another country who also sought IMF assistance to support its sliding exchange rate, In October 1997. The rupiah lost more than three-quarters of its value within one year, despite a total commitment of $36 billion (of which about $14 billion disbursed). ‘‘The government’s endeavors to assist struggling banks and corporations resulted in a quick accumulation of Indonesia’s public debt and forced it to seek restructuring agreements with the Paris and London Clubs’’. ‘‘Investors and, to an inestimable degree, the population bore the crisis’ burden since stabilization efforts were far less effective than in Thailand’’ (Andritzky, 2006:29).

External debt, in a broader context, is a factor in Asian crisis and this type of debt played a key role in the following financial difficulties. For instance, when the crisis hit Indonesia’s private sector had a considerable external debt (Calvo, 1998:7).

The fragile banking system and a crusted corporate sector led to a start of a sellout of won assets. After this maelstrom South Korea was caught, an international aid package of $58 billion that is larger than the Mexican bailout in both absolute and relative terms, quickly helped stabilize the most important economy in South-East Asia. The government was able to re-access the international capital markets with two bonds issued at moderate spreads of around 350 basis points, just soon after the crisis (Andritzky, 2006:29).

The Asian crisis is only moderately relevant to this study because none of the affected countries were significant players in the sovereign bond markets. Yet, it is interesting with regard to crisis mechanics. All in all, it is still useful to keep these events in mind since they unmasked a once so-called economic miracle and re-minded investors of the dangers of hidden imbalances and contagion (Andritzky, 2006:30).

The inflow of foreign capital, particularly short-term capital, was often actively encouraged by governments. For example, the Korean government allowed chaebols to convert the finance companies they owned into merchant banks which were allowed to borrow freely abroad as long as the debt was short-term. A similar phenomenon occurred in Thailand which allowed finance companies borrow from foreigners. The result was substantial increases in foreign indebtedness relative to the country's holding of international reserves: Mexico, Thailand, Korea and Indonesia all ended up with ratios of short-term foreign debt relative to reserves exceeding 1.5. The high degree of illiquidity in these countries suggests that they were vulnerable to a financial crisis (Randalet and Sachs, 1998) (Mishkin, 2001:9).

Russia 1997-1998

The largest default of 1998 was that of Russia as the country suffered a currency, banking and fiscal crisis, as a result of external shocks in the form of weak oil and nonferrous metals prices, unfavorable market sentiment after the Asian crisis, and unsustainable government budget policies (Moody's, 2009:7).

Just like many other transition countries, economic reform led to inevitable declines in real GDP (12% in 1991) and huge fiscal deficits (26% of GDP in 1991) in Russia, too (Andritzky 2006:30).

Russia underwent a stabilization process from July 1995 onwards, anchored by the policy of maintaining the exchange rate within a band (Baig and Goldfajn, 2000:4). Thanks to the IMF programs installed in 1995 and 1996, the Russian economy rebounded in 1997 after an eight-year recession (Andritzky 2006:30).

Russia continued to incur large fiscal deficits of 7-8½ percent of GDP at the federal level through 1996-97, leading to a huge increase in its debt burden, particularly at the short term maturity end. Besides, a drop in international prices for Russia's main exports resulted in a deterioration in the external terms of trade by almost 18 percent, year-on-year, by mid-1998. Since investor withdrawals from emerging markets affected its capital account, the impact of the Asian economic crisis was severe on Russia. Compared with the previous 12-month period, net financing of the federal government deficit by nonresidents in the form of Eurobonds and ruble-denominated debt declined by 1.8 percent of GDP during July 1997-June 1998 (Baig and Goldfajn, 2000:4).

As political turmoil, growing fiscal imbalances while the programs introduced strict rules for the monetary policy and deterioration in the external environment cast increasing doubts on Russia's ability to come to contain its

economic fragility, such a policy proved unsustainable. The result was a severe financial crisis that erupted in mid-1998, primarily depending on the failure to tackle underlying fiscal problems (Baig and Goldfajn, 2000:4).

From late-1997 onwards, domestic interest rates increased sharply in response to the deterioration in the balance of payments. The lack of decisive fiscal adjustments led to large losses of external reserves, despite the fact that the ruble was successfully maintained within its band until mid-August 1998 (Baig and Goldfajn, 2000:5).

The authorities announced a restructuring of ruble-denominated government debt and a widening of the exchange rate band in August 1998, faced with a severe cash-flow problem as investors continued to withdraw from the government debt market and as international reserves dropped precipitously. The ruble was subsequently allowed to float in early September. The government initiated talks with creditors for a rescheduling of Soviet-era external debt falling due in 1999-2000, halting the servicing of such debt (Baig and Goldfajn, 2000:5).

The newly established domestic market for short-term ruble bonds (the ‘‘GKO’’ and ‘‘OFZ’’) was used to refinance the gap, which were mainly bought by domestic financial institutions and, in turn, refinanced abroad. This created an unsustainable mismatch over time. ‘‘Notwithstanding this development, Russia succeeded in placing several eurobond and ‘‘MinFin’’ issues (domestic dolar denominated bonds), and reached agreements with the Paris and London Clubs’’. The state-owned Vnesheconombank converted $31.8 billion of Soviet-era debt into principal notes (‘‘Prins’’), via a deal with London Club (Andritzky, 2006:30).

Both a plunge in commodity prices and investors’ doubts about emerging market investments as consequence of the Asian Crisis of 1997 meant a powerful

external shock. The insolvent government was no more able to defend against the market pressure in August 1998, in an environment of internal political deadlock and a non-performing IMF program. The government was forced to devalue the currency as well as declare a moratorium on all public ruble debt and part of the foreign liabilities, because of the chronic fiscal deficit and the drain of reserves as a result of defending the ruble. A bank run was triggered by further political turmoil, correctly forestalling a banking crisis as the banks carried the main burden of the GKO and OFZ default (Andritzky, 2006:30).

Russia defaulted on Prins and subsequently on IANs, in December 1998. However, Eurobonds and MinFins (except for the ‘‘MinFinIII’’ issue) were not affected. The fact that the London Club did not call in its loans (which could cause Russia considerable legal trouble with creditors) was an important positive factor that helped calm down the crisis. In 1999, another rescheduling with the Paris Club was settled, and the IMF resumed support. In February 2000, renegotiations with the London Club reached an agreement on the exchange of $22.2 billion of Prins, $6.8 billion of IANs and some $2.8 billion of past due interest. This restructuring contributed to the country’s solvency by offering substantial cash flow and debt relief (Andritzky, 2006:30).

‘‘Since then, Russia has recovered astonishingly quickly’’. Restoring strong GDP growth since 2000, is achieved by the help of high commodity prices and sound fiscal and monetary policies. The government became able to re-access foreign lending sources, along with the steadily declining total external debt ratio. ‘‘Russia enjoys an investment-grade rating by Moody’s since 2003 and by Standard & Poor’s since 2005.’’ (Andritzky, 2006:31).

The domestic financial markets suffered highly unfavorable impact due to these developments. After the collapse of a large number of banks that had invested heavily in treasury bills and had extensive foreign currency exposure, the domestic payment system was temporarily impaired, access to international capital markets was severed, and trade financing was severely disrupted. The external effects of the crisis were also dramatic. Both the restructuring of the Russian debt and the devaluation of the ruble, resulted in major losses for investors. The fact that it occurred within the context of an IMF program surprised others, creating a panick about other emerging markets (Baig and Goldfajn, 2000:5).

Brazil 1998-1999, 2002-2003

Brazil had a relatively healthy economic situation characterized by sustainable fiscal policies despite high inflation, through the 1990s. The Real Plan of 1994 which had mainly aimed at disinflation is blamed to have created the imbalances which lead to the crisis in 1998-1999. The fiscal deficit increased as a result of deflationary fiscal and monetary policies, for example through asymmetric indexation of revenues and expenditures. The crawling peg caused a current account deficit since it adjusted too slow to prevent an appreciation in real terms (Andritzky, 2006:31).

The pressure on the real increased, with negative external economic environment after the Asian Crisis. The Cardoso administration attempted to maintain the peg as anchor for inflation expectations. Yet, markets believed in a significant overvaluation of the Real. IMF tried to support the unsustainable situation with a program to restock reserves. This still was not enough to persuade the market forces. Record capital outflows of $14 billion within a few days are observed when Brazil floated the real in January 1999 after a reform of the peg. The debt burden was

stil not believed to exceed the sustainable limit, despite the fact that public debt, and especially external debt, quickly expanded in the run-up to the crisis. Yet, it became impossible to access the international markets for liquidity with bond spreads of 1,500 basis points at the crisis' peak. Instead, a rollover of short-term credits was negotiated with major international banks (Andritzky, 2006:31).

The output fall remained small and the banking sector got off lightly, at the end of the crisis. ''Roubini and Setser (2004) argue that the large amount of reserves spent on supporting an unsustainable exchange rate peg helped banks and firms to create hedges against a widely anticipated devaluation''. As a result, recovery was quick when growth resumed the following year, proven by the ahead of schedule repayment of IMF emergency loans (Andritzky, 2006:31).

There was still marks on the public budget, as a result of the crisis. The government created a currency mismatch on its own balance sheet because of the offering of dollar-linked debt during the currency crisis. Brazil's public debt ratio reached to 70% in 2001. ''IMF assistance was readopted in the light of the Argentine crisis which, in the end, had less effect on Brazil than anticipated''. Investor confidence slumped, with the concerns about the populist presidential candidate, Luiz Inacio Lula da Silva, and his platform plank not to repay foreign debt. In autumn 2002, the country's sovereign bond spreads widened to 2,000 basis points. ''While solvency was clearly disputed, it is nevertheless hard to fit this bond market panic into the traditional scheme of solvency and liquidity crises''. Lula's campaign against foreign creditors resembles more the antique fear about a sovereign's discretion to repudiate foreign creditors. An unexpectedly prudent economic policy by the new administration (lagging its previous rhetoric) and another major rescue package by the IMF, resolved most doubts. The international bond market was

touched again for new issues in mid-2003. Despite the fact that the BB rated country remained high debt levels, external bond spreads declined to around 400 basis points in 2005 (Andritzky, 2006:32).

Turkey 2000-2001

Since the onset of the cold war, Turkey had played a major role as a strategic partner for the West to secure considerable rescue assistances throughout the country's long history of financial crises. An economic stabilization effort started after the military coup in the 1980, under a military rule in the 1980s, to avoid a major crisis like of 1959, 1965, and 1979. Turkey liberalized its capital account in 1989 and attempted to attract foreign direct investments into the country. The volatile nature of portfolio flows made Turkey vulnerable to any decrease in global investor confidence for emerging markets, whereas direct investments proved healthy for the economy. On the one hand large inflows from abroad promoted the economic growth, on the other hand the economy thus became increasingly inflated. Large public investments, which were refinanced abroad, were responsible for part of the boom. The consequence is Turkish economy's having become a typical example of boom-bust cycles. This process also coincided with widespread corruption (Andritzky, 2006:35).

Following the emerging market woes in 1997 and 1998, and a destructive earthquake in 1999, the economic conditions in Turkish economy worsened. Eight banks became insolvent, pointing to the fragilities in banking sector. In December 1999, the government initiated a crawling peg fort he Turkish Lira to bring down inflation, which was backed by an IMF stand-by loan. The peg which had been preannounced to be in place for only 18 months failed to curtail inflation expectations, despite structural reforms and fiscal adjustments. The trade deficit soared be-

cause of the real appreciation in the Lira. At the same time, government refinanced the expanding fiscal deficit with short-term bills placed among domestic banks. High nominal rates attracted portfolio inflows and international reserves grew in absolute terms. Yet, international reserves covered only 50 percent of short-term external debt by the end of 2000 (Andritzky, 2006:35).

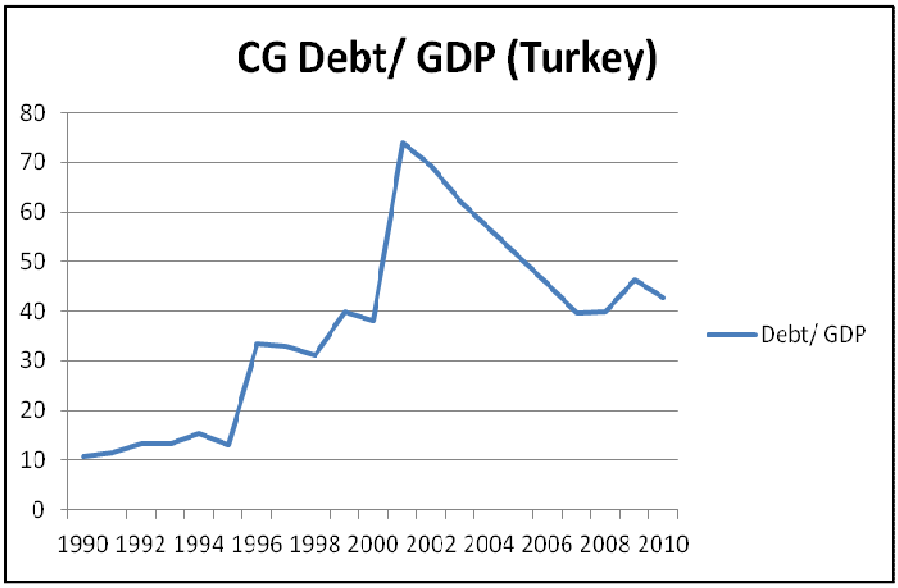

Figure 2. Central Government Debt-to-GDP of Turkey (1990-2010)

The Turkish crisis of 1994 results in a start of a strong increase in Turkey's debt-to-GDP ratio. A lack of fiscal discipline leading to high interest rates and a deteriorating economic growth mainly as a result of a series of international financial crises, was the rationale behind that debt-to-GDP ratio of the country skyrocketed between 1995 and 2000. The Marmara Earthquake of 1999 and the severe financial crisis of 2001 strongly contributed to the rapid increase in the debt-to-GDP ratio. Solid fiscal permance and abundant global liquidity in the 2002-2007 period made it possible for Turkey to cool the central government to GDP ratio. The final result is even far better than one of the famous Mastricht criteria: ''the gross government debt to GDP ratio must be no more than 60 percent.''.

The sudden collapse of investor confidence triggered capital flight in November 2000, as a result of various events such as emergence of a banking scandal, political turmoil, and contagion from Argentina (Andritzky, 2006:35).

Domestic banks were unable to roll over their debt, and bid on local markets for financing, due to the lack of confidence of foreign investors. Foreign reserves slumped and a liquidity crunch in the domestic banks became a matter of fact because of a massive exit from the lira. The agreement of a first $10.5 billion IMF aid package in December 2000 helped calm the situation, but a political conflict over the peg fostered speculations. In February 2001, the peg was abandoned and the lira lost about one third of its value against the US dollar. Large fiscal imbalances, political fragility, and high inflation made any policy efforts ineffective, causing an even weaker real sector performance than expected, despite a revision of the IMF program and additional stand-by assistance in May 2001 (Andritzky, 2006:35).

Turkey's strategic role in the Middle East was reinvigorated despite the fact that the events of September 11 terrorist attacks worsened the overall situation for emerging markets. By the end of 2001, a new stand-by agreement provided additional funds. In the meanwhile, the country went through a typical deflationary period. Corporate insolvencies reduced the foreign exchange demand by defaulting on external debt. Despite a high public debt load (running close to 100% of GDP), continued IMF bailout packages, and sound fiscal management enabled the government to avoid a debt restructuring. The long-term sustainability of the debt is disputable. However, the government was able to overcome recent political irritations, like a break up of the coalition government in mid 2002 or the parliament's denial of the deployment of U.S. troops in Turkey for the Iraq war in 2003 (foregoing a large multi-year support package). With the EU accession talks underway, a convergence play

helped pulling spreads down to little above 200 basis point in 2005 (Andritzky, 2006:36).

Karagol (2005) calculated danger zones for debt rescheduling of Turkey for some debt ratios. The danger zone for debt service ratio is 0.51 while the danger zone for debt stock/reserves ratio is 10.20. The danger zones for exports/GNP ratio and the danger zone for investment/GDP ratio is 0.048 and 0.19 or under. The probability of rescheduling increases under these levels of exports/GNP ratio and investment/GDP ratio (Karagol, 2005:29).

Argentina 2000-2005

During 2000-2006, there have been seven additional defaults, led by Argentina's USD 82 billion default in 2001, which spilled over to Uruguay two years later (Moody's, 2009:7).

In December 2001, Argentina defaulted on its international debt and fell into a deep economic crisis. During the crisis, consumption and output collapsed, interest rates increased, and the trade balance experienced a sharp reversal (Arellano, 2008:2).

Argentina has struggled with several sovereign debt issues in the first half of the past decade including a mega bond restructuring in 2005. Despite the fact that the country is considered as one of the wealthiest countries a century ago, Argentina lost its economic prosperity since 1950s since Peron favored populist policies leaving a heavily regulated economy. Argentina was the first country to enjoy debt relief from the Paris Club in 1956. In 1991, Carlos Saul Menem with his economy minister Domingo Cavallo, introduced a currency board with vis-a- vis dollar peg (‘‘convertibi-

lidad''). Whereas inflation faltered and economic growth is steamed up, structural reforms such as deregulation, trade liberalization, privatization led to a larger public deficit after 1994. Under the Brady Plan, the country received a debt reduction in 1993, which grants the government access to the international capital markets. Future public deficits were financed by foreign debt issues (Andritzky, 2006:36).

Argentine economy looked stable and served as a role model for the IMF during the crises in Mexico and Asia. Argentina was caught in an unsustainable situation, at the time the important Mercosur partner Brasil devalued its currency. A recession became inevitable for Argentina due to high domestic interest rates and overvalued currency (Andritzky, 2006:37).

Markets quickly deemed the external debt load unsustainable as its debt-to-export ratio increased to 400%. An economic program, announced under the name ''blindaje'' (armor plate) in December 2000, came along with the first rescue package from multilateral creditors valued at $20 billion. The impact of these measures quickly degraded due to the lack of both domestic support and external confidence (Andritzky, 2006:37).

First, a liquidity crisis unfolded. A lack of market access gave rise to the ''megacanje'', a mega bond swap in order to extend maturities in June 2001 when Argentina faced major rollover needs. A broad number of debt issues were eligible for exchange into one short local bond and three global bonds maturing in 2008, 2018 and 2031. While local pension funds were not left much of a choice, the tender was voluntary for other creditors. With a participation of $29 billion of debt (almost half of all eligible claims) the swap was a stunning success despite the conviction that te overall debt situation was unsustainable. However, the deal significantly increased the overall debt stock. Market confidence remained low and led to

subsequent difficulties when provincial entities tried to roll over their debt (Andritzky, 2006:37).

Investors became increasingly convinced of Argentina's insolvency. Despite efforts to stabilize the situation, market spreads increased to 1,600 basis points. As capital flight intensified, the IMF reluctantly granted another credit line to prop up central bank reserves. After disappointing tax collection figures in September, the government sought support for voluntary debt relief in two stages. In the first stage, domestic bondholders were supposed to exchange their bonds into loan instruments under local legislation, guaranteed by tax revenues. These included reductions in coupons and a maturity extension. While the idea was to preserve the local financial institutions, creditors recognized the implied default threat and tendered almost all eligible claims in November. The segmentation of bondholders into domestic and foreign creditors was not perceived well by international investors. Rating agencies judged the transaction as technical default, making it impossible for the IMF to grant further support. Before announcing the second stage (which presented an exchange offer to foreign creditors), massive capital flight led to the collapse of two large banks. The policy response of a bank holiday and a deposit freze ended in street riots, forcing the recignation of Menem administration. Under the applause of the parliament, the new interim president Adolfo Rodriguez Saa announced the suspension of payments on all foreign bonded debt in December 2001 (Andritzky, 2006:37).

Ousted after seven days into tenure, Eduardo Alberto Duhalde introduced a painful pesification of the banking sector, and first devalued and then untied the peso peg in the beginning of 2002. What followed is an economic crisis of historic proportions in Argentina. The peso overshot and temporarily lost three-quarters of its

value relative to the dollar. Output fell by 20%, GDP faltered by 11%, inflation and unemployment shot up, and depositors lost much of their savings. The situation stabilized in the third quarter of 2002. In January 2003, the IMF resumed its support with a short-term stand-by arrangement. In 2003, GDP increased by almost 9% and unemployment was down by a quarter. Economic recovery and political stability under the new president Nestor Kirchner was remarkable (Andritzky, 2006:38).

Similar to his rough rhetoric with regard to multilateral agencies, the Kirchner administration took a hard stance towards the holders of the defaulted debt. After a failed sketch of a restructuring in 2002, a slightly improved exchange offer was launched to domestic and international bondholders in December 2004. Despite widespread resentment among the investors, the final participation rate reached 76%, achieving substantial debt relief for Argentina. Total sovereign debt fell by one-third to around 81% of GDP, converting part of the external debt into local currency. Regardless of the uncertainty about hold-outs and a wave of lawsuits, the government is expected to re-access international bond markets soon. After the swap, the country was assigned a B- rating by S&P, and bond spreads tightened to less than 400 basis points (Andritzky, 2006:38).

The sovereign debt crises of developed countries between 2008 and 2010

The financial crisis of 2008 was a real shock. With a few notable exceptions –such as Nouriel Roubini, Bob Shiller, and Bill White- central bankers, financial sector supervisors/regulators, other policymakers, the private sector (rating agencies, analysts), and academic economists underestimated the severity of current global crisis (Kawai and Pomerleano, 2009:1).

Developed countries have responded to the crisis by providing fiscal resources. The total value of financial rescue packages in home of the three major western regions between October 2008 and 15 September 2009 was 2.75 trillion USD, including 700 billion in the US (not including AIG), 680 billion USD in the UK and 1.37 trillion in the eurozone. The size of the rescue package as a percent of GDP for the UK is by far at largest at 20% followed by the US at 6.7%, while figures for other economies are much smaller. This reflects the fact that the bulk of the financial distress originated in the UK and the US (Kawai and Pomerleano, 2009:18).

Besides, between October 2008 and 15 September 2009, the G20 nations have announced about 2 trillion USD worth of fiscal stimulus measures, including 790 billion USD for the US, about 260 billion for the EU and 260 billion for USD for Japan. Asian economies have also announced sunstantial stimulus packages. (Kawai and Pomerleano, 2009:18).

Against a backdrop of weak economies, all this activity means that government fiscal deficits and debt levels were rising rapidly, and risks for future market stability have been builded up then (Kawai and Pomerleano, 2009:18).

Reinhart and Rogoff (2009) suggest severe financial crises are followed by deep and lasting effects on asset prices, output and employment. Recessions triggered by financial crises eventually end, but almost always accompanied by massive increases in government debt (Reinhart and Rogoff, 2009:12). The real value of government debt tends to explode, rising an average of 86 percent in the major post–World War II episodes (of banking crises). The main cause of debt explosions is usually not the widely cited costs of bailing out and recapitalizing the banking system. The collapse in tax revenues in the wake of deep and prolonged economic contractions is a critical factor in explaining the large budget deficits and

increases in debt that follow the crisis. Our estimates of the rise in government debt are likely to be conservative, as these do not include increases in government guarantees, which also expand quickly during these episodes (Reinhart and Rogoff, 2009:2). Looking at percentage increase in debt, rather than debt-to-GDP, because sometimes step output drops would complicate interpretation of debt–GDP ratios (Reinhart and Rogoff, 2009:11). Big surges in government spending to fight the recession is another main contributor in the characteristic huge buildups in government debt (Reinhart and Rogoff, 2009:11).

The global financial and economic crisis of 2007–2010, which originated in the United States (US) subprime mortgage market, triggered a chain reaction in the US and global financial systems. These problems reached their zenith with the collapse of Lehman Brothers, when it became clear that there would be a deep global recession. European financial markets were not isolated from developments in the US. To stem the evolving crisis European national governments massively injected capital in financial institutions (e.g. Hypo Real Estate, Fortis, Anglo-Irish, etc.) and undertook fiscal stimulus measures. The single currency, however, proved vulnerable to the crisis because it was created without a single supranational government above it to control tax, spending and transfers between the euro area's richer and poorer economies. Consequently, financial markets distrust some of the European governments resulting in a sovereign debt crisis. The country worst hit to date by this sovereign debt crisis is Greece. It is in a deep economic recession and cannot borrow anymore on international capital markets. Since early 2010 it receives financial support from a joint EMU-IMF rescue package. Recently, Ireland and Portugal also received support from the other EMU countries and the IMF (Grammatikos and Vermeulen, 2012:2).

Since the onset of the financial crisis, sovereign risk premium differentials in the euro area have been widening. Although the perceived risk of default for euro area countries remained generally low, financial markets appeared to have been increasingly discriminating among government issuers while requiring overall higher risk premiums. In particular, the spreads on the yield on 10-year government bonds over Bunds spiked in January 2009 for various euro area members, accompanied by downgrades of sovereign debt ratings for three countries Greece, Spain, and Portugal—and a warning for Ireland (Sgherri and Zoli, 2009:3).

The table below is important in respect that it clearly identifies three different periods regarding spread differentials of major European countries against Germany.

Table 9. Average 10y–spreads against Germany

	Aus	Bel	Fin	Fra	Gr	Ire	It	Neth	Port	Spa
99.01-07.07	14.4	17.8	12.6	8.4	53.5	11.6	26.2	8.6	20.9	14.2
07.08-10.04	46.8	49.2	34.3	30.4	147.9	113.8	80.5	30.2	75.2	52.8
09.09-10.04	45.1	48.5	28.1	32.9	257.4	160.1	86.5	27.1	98.8	68.4

Source: Arghyrou and Kontonikas (2010:5)

In the period until Summer 2007, most of the countries enjoyed relatively abundant liquidity. After deteriorating prospects for global liquidity and worsening growth that led to an increase in debt-to-GDP ratios, another era came for with higher spreads against Germany between Summer 2007 and the April 2010. April 2010 is the official recognition of European sovereign debt crises, followed by international rescue packages. From Autumn 2009 on, spreads has become extremely dramatic for countries especially suffering a sovereign debt crisis (namely PIIGS).

The recent rebound of euro area sovereign spreads is even more noticeable from a historical perspective, as it follows a prolonged period of very modest differentiation across countries. Ever since the introduction of the single currency,

the remarkable compression of sovereign risk premium differentials has raised doubts about financial markets' ability to provide fiscal discipline across euro area members—that is about their capacity to price higher default risk for governments pursuing unsound fiscal policies. The latest widening in euro area sovereign spreads provides a unique opportunity to re-examine the role played by fiscal conditions in explaining yield differentials (Sgherri and Zoli, 2009:3).

In addition to fiscal vulnerabilities and—hence—default risk concerns, discrimination among sovereign issuers may reflect considerations about the relative liquidity of different government bond markets. Indeed, the financial turmoil may have led to a flight to safety and liquidity, resulting in a decline in the yields of the most liquid sovereign bond markets—such as the benchmark Bunds. The literature tends to recognize the importance of liquidity risk in explaining interest rate differentials within the euro area, although the size of this effect remains somewhat controversial (Sgherri and Zoli, 2009:3).

Following the start of the financial crisis, government exposure to weakness in the financial sector may have also become a factor in explaining sovereign spreads in the euro area. In this respect, some countries have committed large resources to guarantee financial institutions, thereby establishing a potentially important link between financial sector distress and public sector bailouts (Sgherri and Zoli, 2009:4).

There are some countries that are often thought to be in a similar situation and are thus sometimes named together under the title ‘‘PIGS’’ (for Portugal, Ireland, Greece and Spain) or the variation ‘‘GIPSY’’ (for Greece, Ireland, Portugal, Spain and Italy) (Gros, 2010:1).

More than a year after it started in Greece and later on spread to three other peripheral countries, Ireland, Portugal and Spain, the sovereign debt crisis in the euro area still goes on. True, significant steps have been taken to resolve the predicament. Crisis mechanisms have been set up by the EU (the European Financial Stability Mechanism - EFSM) and by the euro area (the European Financial Stability Facility - EFSF), and financial assistance has been provided to Greece and Ireland. Governments in these and other affected countries have implemented severe austerity measures and started to put in place structural reform programmes. And the European Central Bank (ECB) has embarked on a (controversial) peripheral sovereign debt purchase programme, while continuing its earlier support to euroarea banks with ample liquidity provision (Darvas et al., 2011:2).

There are a lot of significant common features among the most affected countries from the European sovereign debt crisis, namely Greece, Ireland, Portugal, and Spain. Once they have spent and lived beyond their sources through accumulating private and/or public debt and producing large current account deficits; nominal wages have also grown beyond what is justified by productivity gains, resulting in prices growing too fast relative to the rest of the euro area. In some cases (Ireland) price divergence essentially took place in the non-traded sector – especially construction and services – whereas in other countries the traded sector – especially manufacturing – was also affected. Such behaviour, and the policies that made it possible, was fundamentally at odds with euro participation. In the last two years adjustment has started in these countries and major policy measures have been taken. Results are already visible in Ireland (Darvas et al., 2011:4).

However, as argued by Marzinotto *et al* (2010), the Greek crisis stands apart from those in the other peripheral countries. First, Greece's public debt predicament

has arisen mainly because of public finance mismanagement, while banking problems have played a secondary role. Second, with a debt-to-GDP ratio scheduled to exceed 150 percent, Greece was clearly on the verge of insolvency. By contrast, in Ireland and Spain, the public finance consequences of private-sector debt accumulation is the main reason for solvency concerns, not least because of the cost of rescuing insolvent banks. Public debt levels in Ireland, Portugal and Spain are more manageable than in Greece (Darvas et al., 2011:4).

Gross debt to GDP ratios increase across all EMU countries during 2007–2011, but with different magnitudes. The increases in Ireland (62.3%), Greece (38.2%) and Spain (36.3%) are the largest, resulting in several debt rating downgrades and, in the case of Greece, Ireland and Portugal even an inability to borrow on the financial markets (Grammatikos and Vermeulen, 2012:5).

Since late 2009 a division in Europe becomes apparent with some countries following Germany with decreasing CDS spreads and another group following Greece with increasing CDS spreads (Grammatikos and Vermeulen, 2012:5).

Table 10. 5-year Government Bond CDS Spreads on Key Dates of the Financial Crisis

CDS spread (basis points)						
North						
Date	Fin	Ger	Neth	Fr	Aus	Bel
27.02.2007	N/A	3	2	2	2	2
15.09.2008	13	10	12	14	13	23
31.08.2010	30	44	49	81	93	132
South						
Date	Italy	Spain	Portugal	Ireland	Greece	
27.02.2007	7	3	4	11	6	
15.09.2009	47	44	45	34	57	
31.08.2010	231	246	346	352	926	

Source: (Grammatikos and Vermeulen, 2012:7)

The European sovereign debt crisis has been the theater of sovereign credit rating downgrades, widening of sovereign bond and credit default swap (CDS) spreads, and

pressures on stock markets. Interestingly, financial markets throughout the Euro zone have been under pressure although until mid-2011 credit rating actions were concentrated in few countries such as Greece, Iceland, Ireland, Portugal and Spain (Arezki, Candelon and Sy, 2011:3).

Table 11. Rating Announcements

	Country	Date	Rating Announcements	Rating Agency
1	Lithuania	10/23/2006	Upgrade & Outlook revision	Fitch
2	Iceland	11/20/2007	Outlook Revision	S&P
3	Ukraine	6/12/2008	Downgrade & Outlook Revision	S&P
4	Russia	10/23/2008	Outlook Revision	S&P
5	Ukraine	10/24/2008	Downgrade & Outlook Revision	S&P
6	Croatia	10/27/2008	Outlook Revision	S&P
7	Romania	10/27/2008	Downgrade	S&P
8	Bulgaria	10/30/2008	Downgrade & Outlook Revision	S&P
9	Hungary	11/7/2008	Downgrade	Moody's
10	Latvia	11/7/2008	Downgrade	Moody's
11	Turkey	11/13/2008	Outlook Revision	S&P
12	Hungary	11/17/2008	Downgrade & Outlook Revision	S&P
13	Iceland	11/24/2008	Downgrade	S&P
14	Iceland	12/4/2008	Downgrade	Moody's
15	Russia	12/8/2008	Downgrade	S&P
16	Czech Republic	12/8/2008	Outlook Revision	Moody's
17	Russia	12/12/2008	Outlook Revision	Moody's
18	Ireland	1/9/2009	Outlook Revision	S&P
19	Spain	1/12/2009	Outlook Revision	S&P
20	Portugal	1/13/2009	Outlook	S&P

			Revision	
21	Greece	1/14/2009	Downgrade & Outlook Revision	S&P
22	Spain	1/19/2009	Downgrade & Outlook Revision	S&P
23	Portugal	1/21/2009	Downgrade & Outlook Revision	S&P
24	Ukraine	2/12/2009	Downgrade	Fitch
25	Latvia, Lithuania, Estonia	2/24/2009	Downgrade & Outlook Revi-sion	S&P
26	Ukraine	2/25/2009	Downgrade & Outlook Revision	S&P
27	Greece	2/25/2009	Outlook Revision	Moody's
28	Ukraine	2/25/2009	Downgrade & Outlook Revision	S&P
29	Spain	3/9/2009	Maintain Outlook	Moody's
30	Hungary	3/21/2009	Downgrade	Moody's
31	Slovakia	3/27/2009	Outlook Revision	Moody's
32	Hungary	3/30/2009	Downgrade	S&P
33	Ireland	3/30/2009	Downgrade	S&P
34	Estonia, Latvia and Lithuania	4/8/2009	Downgrade	Fitch
35	Croatia	4/17/2009	Downgrade	Moody's
36	Latvia	4/23/2009	Downgrade	Moody's
37	Lithuania	4/23/2009	Downgrade	Moody's
38	Montenegro	4/30/2009	Downgrade	Moody's
39	Ireland	6/8/2009	Downgrade	S&P
40	Ukraine	6/12/2009	Downgrade	Moody's
41	Kazakhstan	6/13/2009	Downgrade & Outlook Revision	Moody's
42	Azerbaijan	6/19/2009	Outlook Revision	Moody's
43	Ireland	7/2/2009	Downgrade	Moody's
44	Turkey	9/18/2009	Outlook Revision	Moody's
45	Portugal	10/29/2009	Outlook Revision	Moody's
46	Ireland	11/4/2009	Downgrade	Fitch

47	Iceland	11/11/2009	Downgrade & Outlook Revision	Moody's
48	Turkey	12/3/2009	Upgrade & Outlook revision	Fitch
49	Ukraine	12/3/2009	Downgrade	Fitch
50	Greece	12/8/2009	Downgrade	Fitch
51	Spain	12/9/2009	Outlook Revision	S&P
52	Greece	12/16/2009	Downgrade	S&P
53	Greece	12/22/2009	Downgrade	Moody's
54	Iceland	12/31/2009	Outlook Revi-sion	S&P
55	Bulgaria	1/21/2010	Outlook Revision	Moody's
56	Russia	1/22/2010	Outlook Revision	Fitch
57	Ukraine	3/17/2010	Upgrade	S&P
58	Ukraine	3/17/2010	Outlook Revision	Fitch
59	Portugal	3/24/2010	Downgrade	Fitch
60	Iceland	3/30/2010	Downgrade & Outlook Revision	S&P
61	Lithuania	3/31/2010	Outlook Revision	Moody's
62	Latvia	3/31/2010	Outlook Revision	Moody's
63	Estonia	3/31/2010	Outlook Revision	Moody's
64	Iceland	4/6/2010	Outlook Revision	Moody's
65	Greece	4/22/2010	Downgrade	Moody's
66	Iceland	4/23/2010	Outlook Revision	Moody's
67	Greece	4/27/2010	Downgrade	S&P
68	Portugal	4/27/2010	Downgrade	S&P
69	Spain	4/28/2010	Downgrade	S&P
70	Portugal	5/5/2010	Review	Moody's
71	Ukraine	5/17/2010	Upgrade & Outlook revision	S&P

Source: Arezki, Candelon and Sy (2011:6-7)

The observation that there were very few announcements before July 2008 suggests that rating agencies have not anticipated the macroeconomic weaknesses of European economies prior to the financial crisis (Arezki, Candelon and Sy, 2011:8).

The main finding of Arezki, Candelon and Sy (2011) is that sovereign rating announcements have statistically and economically significant spillover effects both across countries and financial markets implying that rating agencies announcements could spur financial instability. The sign and the magnitude of the spillover effects depends both on the type of announcements, the source country experiencing the downgrade and the rating agency from which the announcements originate. However, Arezki, Candelon and Sy (2011) also find evidence that downgrades to near speculative grade ratings for relatively large economies such as Greece have a systematic spillover effects across Euro zone countries (17 and 5 basis points increase respectively for Greek and Irish CDS spreads). Rating-based triggers used in banking regulation, CDS contracts, and investment mandates may help explain these results (Arezki, Candelon and Sy, 2011:5).

The unprecedented global financial crisis and economic downturn that hit the world in 2007-2008 has resulted in the deterioration of budget deficits and caused an overall increase of sovereign debt levels across the world. This deterioration is mainly due to falling revenues resulting from a decreased real and financial activity. In 2010, advanced countries averaged a budget deficit of 8.3%. In the same year the public debt to gross domestic product ratio in those economies reached a level of 97%, increasing from below 75% in 2006. Research by Reinhart and Rogoff shows that a debt to GDP ratio beyond the 60% to 90% level for developed countries may become counterproductive for the economy and a debt spiral may be created in cases where GDP growth falls below the weighted average interest paid on the bonds. At

the epicentre of the recent sovereign debt crisis are the Euro-area member states, particularly Greece, Ireland and Portugal who have had to procure financial assistance from the European Union (EU), other Euro-area member states, the International Monetary Fund and the European Central Bank in an attempt to regain sustainability by reducing their sovereign debt burden in an orderly manner (Olivares-Caminal, 2011:3).

A broad comparison of economic performances of PIIGS countries throughout the European sovereign debt crisis is important, in the context that these countries nowadays are the most problematic ones all over the globe in terms of a sovereign debt crisis. As a so-called ‘‘PIIGS’’ country in the environment of ongoing sovereign debt crisis in the euro area, Portugal also became one of the countries who received support from the other EMU countries and the IMF (Grammatikos and Vermeulen, 2012:2).

By 2010, Portugal’s gross foreign debt reached 215% ot the country’s GDP, as it hits 635% of the country’s exports and 570% of the country’s tax revenue (Gros, 2010). The situation is dramatic because Argentina’s pre-default gross foreign debt levels are 52% of GDP, 529% of exports and 658% of tax revenue, respectively (Gros, 2010). Gross foreign debt-to-GDP and Gross foreign debt-to-exports ratios of Portugal are much worse than the respective pre-default ratios (1999 levels) of a country which have suffered an infamous disastrous sovereign default at the end of 2001, namely Argentina.

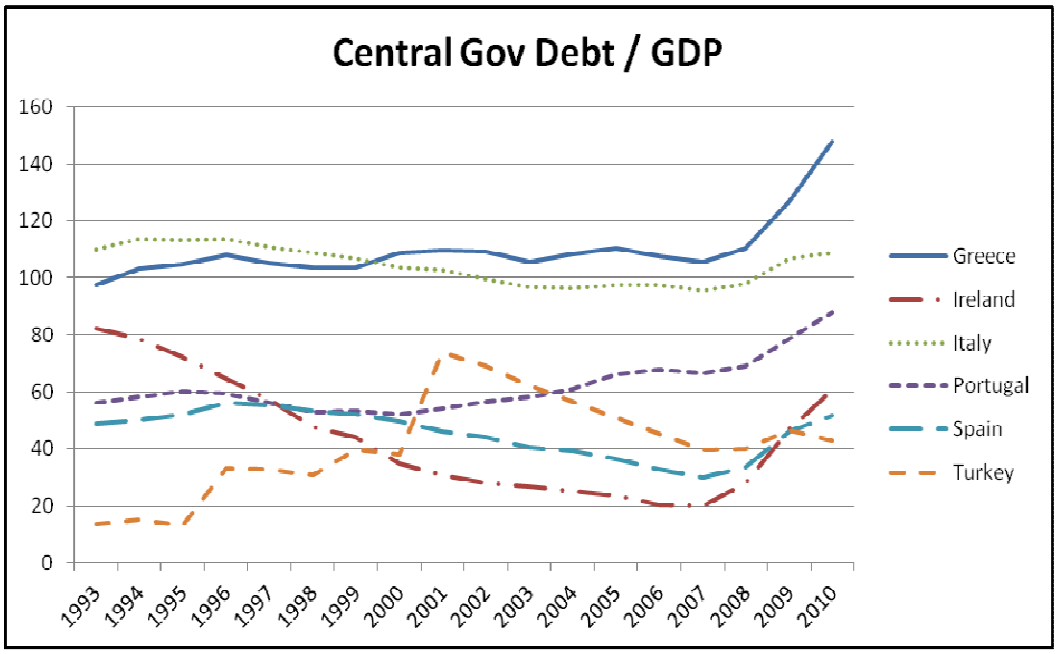

Figure 3. Central Government Debt-to-GDP of the so-called PIIGS with Turkey (1993-2010)

Among the countries who are suffering from sovereign debt crises now, Ireland's story may be the most dramatic one. Not very long ago, in 2007, Ireland was widely regarded as top of the European class in terms of the country's economic achievements. The country had a long period of impressive economic growth, combined with low unemployment and primary surpluses (Whelan 2011:2).

The country appeared to be well placed to cope with any economic slowdown as it had a gross debt-GDP ratio in 2007 of 25% and a sovereign wealth fund worth about €5000 per capita. Fast forward four years and Ireland is shut out of sovereign debt markets and in an EU-IMF adjustment programme. Its debt-GDP ratio has soared over 100% and the sovereign wealth fund is effectively gone.

Ireland's famed "Celtic Tiger" (a popular phrase during the 1990s, for the country's economic achievements) era ended with the collapse of a housing bubble and a banking crisis. As a consequence, many critics have commented that the Irish boom as to a great extent built on a finally unsustainable credit extravagance.

However, it would also be an underestimation that the true progress made by the Irish economy during the two decades prior to 2007 (Whelan 2011:2).

The so-called "Celtic Tiger" had the economic achievements after the Irish government had implemented a wide range of policies that helped to produce large increases in labour productivity. The 1960s saw a move away from protectionist trade policies and set Ireland on the path to EU membership in 1973. Industrial policies focused successfully on encouraging export-oriented foreign direct investment. There was also a gradual improvement in educational standards as policies to provide universal secondary education in the 1960s were subsequently followed by a large expansion of the third-level sector. As a result of these policies, Irish productivity growth consistently outpaced other advanced economies from the early 1970s onwards and by the middle of the last decade, Irish labour productivity was very close to US levels (Whelan 2011:2-3).

On the one hand Ireland's pre-Tiger supply-side policies before 1990s have been good ones, on the other hand its macroeconomic stabilization policies were not of the same quality. Ireland reacted to the global slowdown of the 1970s by running very large fiscal deficits, which cumulated in a debt crisis in the 1980s. At the same time, the traditional currency link with sterling was dropped for membership of the European Monetary System, which provided an unstable monetary regime featuring regular devaluations (Whelan 2011:3).

Ireland's debt-to-GDP ratio was above 110 percent by the mid-1980s, forcing the country to pay nearly 10 percent of GDP for interest payments in a year. Tax rates had been raised to punishing levels in a series of failed attempts to stabilise the deficit and growth had stagnated (Whelan 2011:3).

It was at the depths of this previous crisis that the birth of the Celtic Tiger took place. The period from 1987 onwards saw fiscal problems dealt with via a programme that focused on restraining spending and by 1989, Ireland's debt dynamics had clearly moved in direction of sustainability. At the same time, the EMS finally also delivered a period of monetary stability. With macroeconomic stability restored and good fundamental policies in place, the Irish economy began to grow at an impressive rate. Indeed, Ireland in the late 1980s was primed for growth. While its workers were becoming increasingly productive, Ireland was significantly under-employed by international standards. Only about 30 percent of the population was at work in the late 1980s. This underemployment partly reflected an exceptionally high unemployment rate. However, it also reflected demographic and social factors (Whelan 2011:3-4).

Table 12. Simplistic Keynesian multipliers

Country	Keynesian multiplier: 1/(1-c+m)=1/(s+m)	Excess deficit (actual 2009 – 3%)	Impact of fiscal adjustment on output relative to baseline, in %
Greece	2.5	9.7	-24.6
Italy	1.5	2.2	-3.4
Spain	2	8.2	-16.5
Portugal	1.7	5.0	-8.2
Germany	0.6	0.4	-0.2
Ireland	1.3	9.5	-12.6

Note: The marginal savings rate, s, is computed as the ration of increment in private savings relative to the increment in GDP over the period 2002-07; similarly marginal propensity to import, m, is computed as the ratio of the increment in imports relative to the increment in GDP over the same period. (Source: AMECO.)

Source: Gros (2010:3)

Italy is another European country who suffers a sovereign debt crisis. The GDP of Italy is € 1568 billion, making it just over ten times as much of Ireland's. Assistance to Ireland of, say, 10% of its GDP would have been a bagatelle for the strongest and largest economies of the EU, and even within the capacity of the EU itself although

its budget (€ 140 billion in 2011) is only some 1.2% of EU GDP and is generally recognised to have no macroeconomic significance (Grahl, 2012:4). Thus, assistance to Italy which has an outstanding state debt approaching to € 2 trillion (Grahl, 2012), is not that easy. Yet, decisive assistance for Ireland and Greece (GDP € 217 billion in 2011) would have prevented a severe contagion to Italy (Grahl, 2012:4).

Moody's Investors Service on July 13, 2012, downgraded Italy's government bond rating by two notches to Baa2 from A3, and also warned that it could cut it much further if the country were to lose access to debt markets. Moody's new rating was also below the latest ratings for Italy from agencies Standard & Poor's Ratings Services and Fitch Ratings.

The agency warned that Italy's government debt rating could be downgraded further in the event there is additional material deterioration in the country's economic prospects or difficulties in implementing reform. A further deterioration in funding conditions as a result of new, substantial domestic economic and financial shocks from the euro area crisis would also place downward pressure on Italy's rating.

On the other hand, Moody's said that a successful implementation of economic reform and fiscal measures that effectively strengthen the growth prospects of the Italian economy and the government's balance sheet would be credit positive and could lead to a stable outlook.

The agency also lowered the maximum rating that can be assigned to a domestic issuer in Italy to A2, from Aaa. The lower ceiling reflects the increased risk of economic and financial dislocations.

Moody's said the downgrade was driven by Italy's increased susceptibility to political event risk, such as a Greek exit from the euro zone or Spain requiring further aid.

The agency said the country faced growing funding problems given its high debt levels and significant annual borrowing needs of 415 billion euros ($506 billion) in 2012-2013, as well as its diminished overseas investor base.

Moody's also warned of a further deterioration in the Italian economy, which the rating agency, by July 2012, expects the country to contract by 2 percent in 2012, putting pressure on the country's ability to meet its fiscal targets[4].

Table 13. Gross Foreign Debt

	Gross foreign debt (2008)		
	% GDP	% Exports	% Tax revenue
Greece	147	659	422
Portugal	215	635	570
Spain	156	581	471
Italy	117	406	273
Pro memoria: Argentina (1999)	52	529	658

Sources: IFS, AMECO, WEO, and calculations of Gros (2010)

Greece had a period of high growth between 2000 and 2008 which averaged 4%, with the support of the country's entry to the Euro-area. Yet, this kind of a prosper economic outlook depending on strong consumer demand which was generated by cheap credit, masked the large uncompetitiveness of the economy. Its many weaknesses, signified by chronic fiscal and external deficits, and a large public debt, were made plain in October 2009, when the incoming government announced that earlier fiscal data had been misreported. The general government deficit for 2008 was corrected from 5.0% to 7.7% (later revised to 9.4%) of GDP, while the estimate

[4] Source: CNBC (2012). Moody's Downgrades Italy by Two Notches,http://www.cnbc.com/id/48170245,12.07.2012

for 2009 was raised from 3.7% to a staggering 12.5% (later to 15.4%) of GDP. The public debt estimate for 2009 was also revised from 99.6% to 115.1% (later to 126.8%) of GDP. At the same time, the current account deficit reached 14.7% of GDP in 2008, reflecting the country's steady loss of competitiveness (Bank of Greece 2011) (Matsaganis, 2011:2).

The revised figures stunned public opinion at home and shocked markets abroad. Coming not long after the onset of the international financial crisis, and coinciding with sluggish growth worldwide, the Greek case assumed unanticipated dimensions. In this context the country's dependence on foreign borrowing, heavier than previously thought, proved fatal: markets reacted by increasing spreads (that is, interest rate differentials from German government bonds), and by lowering credit ratings (Featherstone 2011) (Matsaganis, 2011:2).

On 3 March 2010, the government announced a first package of austerity measures, aimed at fiscal consolidation. Although costing the government a great deal in terms of popularity, the announcement failed to persuade the markets. In April, Standard & Poor downgraded the country's credit rating to below investment grade (i.e. junk status), while spreads on 10-year government bonds continued to rise sharply to 1,000 basis points (i.e. 10 percentage points), from 200 basis points in January. At that point, Greece effectively lost access to the international financial markets, and a sovereign debt crisis threatened to develop into a solvency crisis (Matsaganis, 2011:2).

After much procrastination on all sides, an unprecedented €110 billion rescue package was agreed with the European Commission, the European Central Bank and the International Monetary Fund, designed to cover the country's borrowing requirements for the next three years. In return for that, the government signed a

Memorandum of Economic and Financial Policies, ratified by Parliament on 3 May 2010. The Memorandum committed the Greek government to sweeping spending cuts and steep tax increases, aiming to reduce the country's public deficit below 3% of GDP by 2014 (IMF 2010; EC 2010a). To prove the government's trustworthiness, a second austerity package was also announced (Matsaganis, 2011:2).

The rescue package did manage to impress international markets, but caused strong domestic reaction. Civil unrest reached a paroxysm on 5 May 2010, in the context of a huge and largely peaceful demonstration, when three workers lost their lives as extremists set fire to a high-street bank in Athens. The tragedy cast further doubt on the country's future, and lengthened the odds that the rescue package might prove effective (Matsaganis, 2011:2).

The Greek crisis is a combination of external forces (endemic turbulence in financial markets) and domestic weaknesses (chronic fiscal and trade deficits). Therefore, it is unlikely to simply go away as the world economy recovers. By mid-2010 (and in spite of continuing instability elsewhere in the Euro area), all other EU member states had returned to positive economic growth - but in Greece the recession deepened (Matsaganis, 2011:2).

It is not only the size of the adjustment effort that matters. The key indicator of solvency is the size of the primary budget surplus. This needs to be maintained over a period of years to achieve, in the medium term, a gradual return to safe levels of public debt. Here Greece stands apart from the other countries. Even in the optimistic scenario, the primary surplus required to reduce the debt ratio to 60 percent of GDP by 2034 would be 8.4 percent of GDP. It would reach 14.5 percent of GDP under the cautious scenario. This implies devoting between one-fifth and one-third of tax revenues to interest payments on the public debt. Over the last 50

years, no OECD country (except Norway, thanks to oil surpluses) has sustained a primary surplus above six percent of GDP. Even less ambitious targeted would require politically unrealistic surpluses (Darvas et al., 2011:5).

Therefore, Greece became insolvent (Darvas et al., 2011:5).

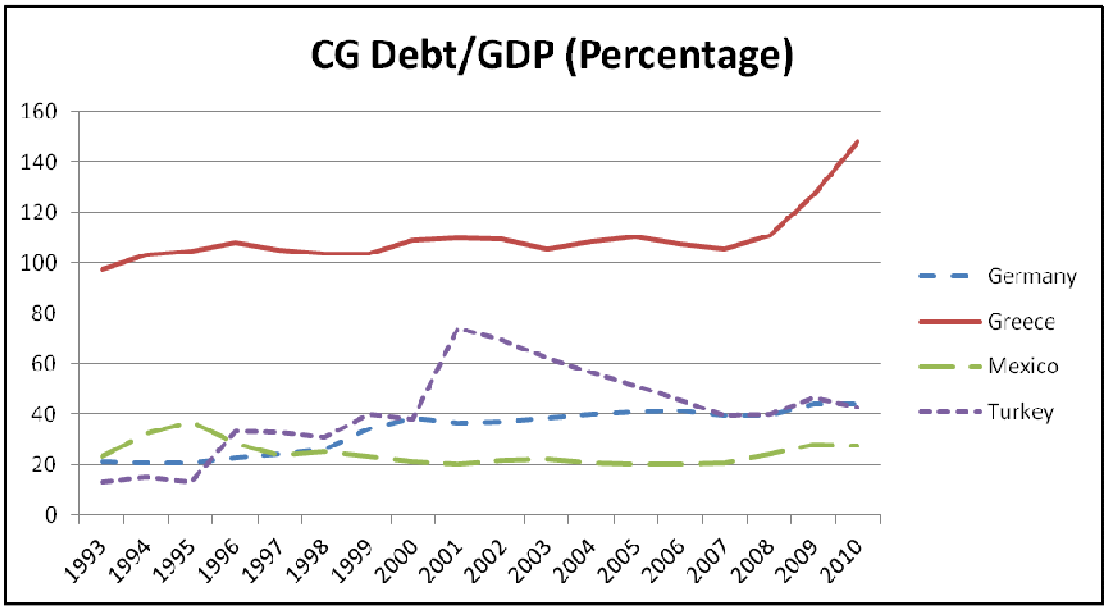

Figure 4. Central Government Debt-to-GDP ratio of Germany, Greece, Mexico and Turkey (1990-2010)

Goldman Sachs helped the Greek government to mask the true extent of its deficit with the help of a derivatives deal that legally circumvented the EU Maastricht deficit rules. At some point the so called cross currency swaps will mature, and swell the country's already bloated deficit (Balzli, 2010).

Creative accounting took priority when it came to totting up government debt. Since 1999, the Maastricht rules threaten to slap hefty fines on euro member countries that exceed the budget deficit limit of three percent of gross domestic product. Total government debt mustn't exceed 60 percent (Balzli, 2010).

The Greeks have never managed to stick to the 60 percent debt limit, and they only adhered to the three percent deficit ceiling with the help of obvious balance

sheet cosmetics. One time, gigantic military expenditures were left out, and another time billions in hospital debt. After recalculating the figures, the experts at Eurostat consistently came up with the same results: In truth, the deficit each year has been far greater than the three percent limit. In 2009, it exploded to over 12 percent (Balzli, 2010).

Now, though, it looks like the Greek figure jugglers have been even more brazen than was previously thought. "Around 2002 in particular, various investment banks offered complex financial products with which governments could push part of their liabilities into the future," one insider recalled, adding that Mediterranean countries had snapped up such products (Balzli, 2010).

Greece's debt managers agreed a huge deal with the shrewd bankers of US investment bank Goldman Sachs at the start of 2002. The deal involved so-called cross-currency swaps in which government debt issued in dollars and yen was swapped for euro debt for a certain period -- to be exchanged back into the original currencies at a later date (Balzli, 2010).

Such transactions are part of normal government refinancing. Europe's governments obtain funds from investors around the world by issuing bonds in yen, dollar or Swiss francs. But they need euros to pay their daily bills. Years later the bonds are repaid in the original foreign denominations (Balzli, 2010).

But in the Greek case the US bankers devised a special kind of swap with fictional exchange rates. That enabled Greece to receive a far higher sum than the actual euro market value of 10 billion dollars or yen. In that way Goldman Sachs secretly arranged additional credit of up to $1 billion for the Greeks (Balzli, 2010).

This credit disguised as a swap didn't show up in the Greek debt statistics. Eurostat's reporting rules don't comprehensively record transactions involving

financial derivatives. "The Maastricht rules can be circumvented quite legally through swaps," says a German derivatives dealer (Balzli, 2010).

In previous years, Italy used a similar trick to mask its true debt with the help of a different US bank. In 2002 the Greek deficit amounted to 1.2 percent of GDP. After Eurostat reviewed the data in September 2004, the ratio had to be revised up to 3.7 percent. According to today's records, it stands at 5.2 percent (Balzli, 2010).

According to calculations by J.P. Morgan, only about EUR 120 bn of Greek government bonds are held by large institutional investors such as banks, pension funds, and insurance companies. This leaves up to EUR 80bn in the hands of asset managers, sovereign wealth funds, and some retail investors (Gulati and Zettelmeyer, 2012:2).

What could Greece do to escape the 'Argentine' vicious circle of higher risk premia and a worsening economic outlook? (Gros, 2010:12).

The only way to minimise the cost of the external and fiscal adjustments that are required to make the situation sustainable was to make Greece more competitive and thus stimulate exports. This could be achieved only by an across-the-board reduction of wages (or rather labour costs) in the private sector of between 10 and 20%. Cuts in wages of this order of magnitude was going to encounter fierce popular resistance. They could come about either at the end of an extremely painful process when unemployment has reached peaks never seen before or they could come much earlier as the result of an overarching national agreement in which the government, opposition parties and the social partners agree on what is needed in the light of present circumstances. Greece thus needed a concerted effort at the national level not just a government that pushes austerity measures through Parliament (Gros, 2010:12)

Here's a chronology of first months of Greece's economic crisis:

October 2009: The new government who won early elections in September 2009 discloses the 2009 budget deficit will be 12.7 percent, more than double the previously announced figure.

November 2009: The new government pledges in its 2010 draft budget to save Greece from bankruptcy by cutting the deficit while keeping electoral promises to help the poor amid the economic crisis.

- Final budget draft shows Greece aims to cut its budget deficit to 9.1 percent of GDP in 2010 to assure EU partners and markets it is serious about restoring fiscal health.
- It also sees public debt rising to 121 percent of GDP in 2010 from 113.4 percent in 2009. EU forecasts on Greece for 2010 are worse, with the deficit seen at 12.2 percent of GDP and national debt rising to 124.9 percent of GDP, the highest ratio in the EU.

December 2009: S&P on December 7 puts the country's A- sovereign rating on negative watch.

On Dec 8, Fitch Ratings, which had cut Greece to A- when the government revealed the higher deficit, cuts Greek debt to BBB+ with a negative outlook, the first time in 10 years a ratings agency has put Greece below the A investment grade.

The next day, Papandreou says he is determined to win back the country's lost credibility.

On December 14, Papandreou outlines policies to cut the country's ballooning budget deficit and try to regain the trust of investors and EU partners. Papandreou announces a 10 percent cut in social security spending in 2010, saying that he will abolish bonuses at state banks and slap a 90 percent tax on private bankers' bonuses.

He also vows a serious fight against corruption and tax evasion, calling them the country's biggest problems.

He announces a drastic overhaul of the pension system in six months and a new tax system that will make the wealthier carry more of the burden. Greece says it now plans to cut its budget deficit to 8.7 percent of GDP this year.

Standard & Poor's cut Greece's rating by one notch on December 16, to BBB-plus from A minus, saying austerity steps announced by Prime Minister Papandreou were unlikely to produce a "sustainable" reduction in the public debt burden.

Yield spreads between Greek and benchmark German 10-year bunds widened to an average 272 basis points on December 19, the widest in more than 8 months, as skeptical markets continue to sell Greek government bonds and stocks.

Moody's cuts Greek debt to A2 from A1 on December 22 over soaring deficits, the third rating agency to downgrade Greece, but still two notches above that of Fitch and S&P. The spread between 10-year Greek and German Bunds tightens after the downgrade.

January 2010: EU officials arrive in Athens on January 7 to ask Greece for a more specifics of its three-year plan to shore up its finances.

Greece unveils the stability program on January 14 saying it will aim to cut its budget gap to 2.8 percent of GDP in 2012 from 12.7 percent. Unions protesting against the austerity plan, announce strikes for February.

February 2010: Papandreou says on February 2, the government will extend a public sector wage freeze to those making below 2,000 euros a month for 2010, excluding seniority pay hikes. On February 3, 2010, EU Commission said it backed

Greece's plan to reduce its budget deficit below three percent of GDP by 2012 and urges Greece to cut its overall wage bill and take extra fiscal measures[5].

The international financial crisis which unofficially started in the summer of 2007, made it definite for the sudden end of a long high growth cycle for Spain which started around 1996 (Suarez, 2010:3).

A construction and real estate boom accompanied the growth cycle. Strong domestic demand contributed to produce a systematic and gradually increasing current account deficit which had an unavoidable counterpart in terms of increasing "indebtedness" with the rest of the world (Suarez, 2005:3).

This indebtedness process was mainly a private sector phenomenon in which banks channeled funds from foreign savers to Spanish firms and households. To interpret the process, it is indispensable to take into account that many Spanish firms used external financing to become large, competitive and internationally diversified business groups. Most of Spanish banks and non-financial corporations maintained reasonable levels of capitalization during the expansion process (Suarez, 2005:3).

By 2004 Spain had become a much more fundamentally developed economy. But there was also a latent accumulation of imbalances: over-specialization in construction, sluggish productivity, declining competitiveness, a large fraction of workers on fixed-term contracts, and an unsustainable growth in real housing prices that fed the hope of many Spaniards to become rich in an easy manner (Suarez, 2005:3).

Economists had identified the unhealthy parts of the process for years. But the authorities did not take sufficient corrective action. Attempted labor market

[5] Source: Reuters (2010). Timeline: Greece's Economic Crisis, http://www.reuters.com/article/2010/02/03/us-greece-economy-events-idUSTRE6124EL20100203, 03.02.2010.

reforms, for example, left the acquired rights of the permanent workers and the prerogatives of the trade unions basically untouched (Suarez, 2005:3).

Monetary policy was no longer under control of Spanish authorities. The so-called dynamic provisions of the Bank of Spain were a possibly failed attempt to slow down credit growth, although they gave banks a good buffer with which to absorb credit losses during the current crisis (Suarez, 2005:3).

In theory, with monetary policy no longer under the control of Spanish authorities (and with negative real interest rates in part of the process), the restrictive role should have been played by fiscal policy. However, our fiscal discipline indicators looked pretty good in the boom years, which allowed governments at all territorial levels to get involved in increasingly generous expenditure policies (Suarez, 2005:3-4).

Standard & Poor's cut Spain's sovereign credit rating for the second time in 2012, on concern that the country will have to provide further fiscal support to banks as the economy contracts. S&P lowered the long-term grade to BBB+ from A, with a negative outlook. Spain's short-term rating was reduced to A-2 from A-1, New York-based S&P on April 26, 2012.

The nation's 10-year borrowing costs have climbed about 70 basis points in 2012 as Prime Minister Mariano Rajoy struggles to convince investors he can control public finances amid soaring unemployment and a contracting economy. Banks threaten to disrupt the premier's efforts as bad loans reach the highest levels in almost two decades.

S&P argued that Spain's budget trajectory would likely deteriorate against a background of economic contraction, and at the same time an increasing likelihood that Spain's government would need to provide further fiscal support to the banking

sector. As a consequence, there are heightened risks that Spain's net general govern debt could rise further.

This is the second downgrade of Spain by S&P in 2012. The firm cut Spain along with France and other European nations on Jan. 13. Since then, the yield on Spain's 10-year bonds have risen to 5.83 percent from 5.22 percent, while borrowing costs for France are little changed at 2.98 percent. Spain's yields are up from about 4.13 percent in January 2009, when S&P stripped it of its top AAA rating.

Yields on 10-year Spanish bonds surpassed 6 percent by the end of April 2012, boosting concern that borrowing costs may reach levels that prompted bailouts for Greece, Ireland and Portugal.

The Bank of Spain said that gross domestic product contracted 0.4 percent in the first quarter of 2012, tipping the nation into its second recession since 2009. Rajoy said March 2 that the nation would miss its 4.4 percent deficit target and then agreed 10 days later with euro-region finance ministers to a new goal of 5.3 percent.

Spain's budget shortfall will reach 6 percent this year and 5.7 percent in 2013, as the government pushes through the deepest budget cuts in at least three decades, according to forecasts from the International Monetary Fund published on April 17, 2012. Debt will reach 84 percent of GDP in 2013, according to the IMF forecasts published on April 17, 2012. While that's less than France and Italy, it's up from 40 percent in 2008, when a real estate boom started to collapse.

S&P stated that they could also consider a downgrade if political support for the current reform agenda were to wane, and also if they see that Spain's external position worsens or its competitiveness does not continue to approach that of its trading partners, a key factor for Spain to return to sustainable economic and employment growth.

By the end of April 2012, Spanish banks probably need 50 billion euros of additional capital, Morgan Stanley analysts estimate. The figure may rise to as much as 160 billion euros in a worst-case scenario, according to Elaine Lin, a strategist at Morgan Stanley in London. The banks could try to raise the capital themselves or get it from either the Spanish government or the European Financial Stability Facility.

Governments committed more than $430 billion in fresh money to the International Monetary Fund to help it protect the world economy against deepening debt turmoil in Europe. The near-doubling of the fund's firepower was announced after Group of 20 finance ministers and central bankers met April 20 in Washington[6].

On European sovereign debt crisis, rescue techniques which have been at least partially implemented include:

- Emergency credits to governments in difficulties, extended bilaterally

or

through the IMF or specific institutions, such as the European Financial Stability Mechanism (EFSF). Because the first Greek bail-out was arranged, by the Commission and the IMF, prior to the establishment of the EFSF and the second, repeatedly delayed, had still not been released at the beginning of March 2012, by that date the EFSF had only made four relatively small loans totaling € 19 billion, two each to Ireland and to Portugal at interest rates around 6%. To begin with the EFSF was able to borrow at rates substantially below that, and up to late October had issued bonds to the tune of €13 billion. However, as the eurozone crisis has intensified, a certain risk premium has emerged even for relatively strong economies, such as that of France, and correspondingly for the EFSF.

[6] Source: Bloomberg (2012). Spain Cut By S&P For 2nd Time This Year On Banks, Economy, http://www.bloomberg.com/news/2012-04-26/spain-cut-by-s-p-for-2nd-time-this-year-on-banks-economy.html, 27.04.2012

The EFSF is able to borrow relatively cheaply because it has guarantees of its liabilities from the member states. However, these are for limited sums. The guarantees, increased in July 2011, total € 780 billion, with the main ones being €211 billion by Germany, €158 billion by France, € 139 billion by Italy € 92 billion by Spain and € 44 billion by the Netherlands. The limitations of the EFSF are many. Firstly, the fact that its credit-worthiness is now seen by investors as similar to that of France rather than that of Germany shows that its own position could become fragile. In particular, if support is required for Spain or Italy then huge new commitments would have to be made at the same time as the guarantees from the member states concerned would lose their value. The leveraging of EFSF assets will tend to call its liabilities into question if Germany does not increase its guarantees.

The limited power of the EFSF was demonstrated as it raised the relatively small amount of € 3 billion – destined for Ireland – on 7th November 2011; it had to offer yields substantially higher than on a previous issue in June – some 177 basis points above the yield on Bunds rather than the previous 51 basis points. A week later the head of the EFSF, Klaus Regling, recognised that it might not be possible to increase the fund to € 1,000 billion as the eurozone countries wished. This is because of market upheaval – but, presumably the EFSF was supposed to prevent such upheavals, rather than succumb to them. An EFSF document describes its current objective that is set by eurozone heads of state and government, as "enlarging the capacity of the EFSF without increasing the Euro-area Member States' guarantee commitments underpinning the EFSF." But that is exactly the point: the refusal to increase the guarantees, specifically to engage the full faith and credit of the German state, means that investors' mistrust of highly indebted sovereign borrowers extends to the EFSF itself.

Secondly, the loans extended by the EFSF have been at relatively high rates of interest and thus did not reduce the burden of debt service for the loan recipients as much as possible. This seems now to have led to a change of tactics: the EFSF has started to borrow for much shorter periods while extending longer-term credits to Ireland and Portugal at interest rates which can be varied as it rolls over its own borrowing.

Thirdly, the conditions imposed on the recipients may prove to be counterproductive: this certainly seems to be the case in Greece where GDP has fallen for four years in a row. Finally, of course, the whole exercise is aimed at providing liquidity rather than dealing with insolvency -debt rollovers as such do not remove an excess of liabilities over assets.

The temporary EFSF was due to be replaced by a permanent structure, the European Stability Mechanism (ESM), with a capital of € 500 billion in 2013.

However, the European Council at the beginning of March 2012 agreed to bring the ESM forward by a year and it seems possible that it will for some time run in parallel with the EFSF. Assuming the latter has by then contributed to the second Greek bail-out, the combined institutions would dispose of some € 750 billion. On this basis it might be possible to obtain further support from the IMF to increase the emergency funds available.

The story here is representative of the EU response to the crisis. There is a response to increasing pressures which staves off immediate breakdown. And the response does gradually become more determined and does gradually mobilize more resources. However, action is always too little and too late to prevent further deterioration of the economic and financial situation.

- Haircuts for the holders of sovereign debt seem to address the solvency issue

directly. A first exercise of this kind took place in July 2011. It was voluntary on the part of the bondholders who were induced to swap their existing Greek paper for much longer dated bonds with a somewhat lower face value. The terms were so generous to investors that they hardly reduced the burden of Greek debt, especially when it is realized that Greek bonds were already significantly discounted on the market, making it possible to buy them back well below their face value.

Pressure to avoid significant losses for investors came obviously from the investors themselves, from the ECB whose normal functioning presupposes the validity of eurozone government debt and from the issuers of credit default swaps on Greek paper who would have to pay out if a default was declared.

A more serious write-down was included in an agreement on October 27th 2011: a 50% reduction in the face value of Greek bonds with the aim of cutting the indebtedness of the Greek government to 120% of GDP by 2020. By the beginning of March 2012, the second bail-out funds were released to Greece; these include € 30 billion as a sweetener to facilitate the write-down as well as a contribution to the recapitalisation of the Greek banks which would otherwise be rendered insolvent by their losses on Greek government debt. It is still not clear whether credit default swap (CDS) agreements will be triggered by these moves, although if they are not it will indicate that CDS contracts are less protection than was previously thought.

In principle, the problem of debts which cannot be repaid should be resolved by the cancellation of liabilities against assets, most obviously against the corresponding claims. Therefore a haircut at least goes further than simple “bailouts” which rearrange, without reducing, state indebtedness. There are two main objections

to the haircut which was announced on October 27 2011, although they point in different directions – one for a bigger, one for a more moderate writedown.

On the one hand it seems very likely that the debt relief provided to the Greek state will be insufficient: the remaining debt will prevent the launch of measures to support production and productivity. On the other, the losses imposed on creditors may directly compromise the banks and other financial institutions involved or lead to a self-fulfilling expectation of further losses from defaults by other states.

The very announcement of the haircut provoked a process of contagion in eurozone bond markets which threatened to close off access to these markets for several other countries. Thus in December 2011 the European Council declared "We clearly reaffirm that the decisions taken on 21 July and 26/27 October concerning Greek debt are unique and exceptional." This is a surrender to the markets by EU leaders because it implies that the outstanding bonds of all states except Greece will be honoured.

It is declared in the same paragraph that future "private sector involvement" will be facilitated by changing the terms of future bond issues: "standardised and identical Collective Action Clauses will be included, in such a way as to preserve market liquidity." It remains to be seen whether Irish, Spanish or Portuguese paper issued with such an implicit threat of default will indeed be saleable. It is not clear that investors will be reassured by the fact that Dutch or German paper includes the same form of words.

From time to time we must impose losses on some banks to encourage the others. The haircut was meant to hold the banks and other investors responsible for the huge imbalances and unsustainable debts which they had indeed financed. But it culminated in a declaration of impunity for the investors – the Greek partial default

could only be implemented with a promise that it would not be repeated. This promise recognised that EU banks are not in a healthy condition and this leads to the third form of crisis management, recapitalisation of the banks.

- Recapitalisation of the Banks, to the tune of €106 billion is part of the

October package, largely to immunize them against the planned write-down of Greek debt. The Greek banks themselves are the most exposed and the EFSF loan to the Greek government includes some € 20-30 billion intended to strengthen their position. It is not clear that this is enough because the Greek banks have other doubtful loans on their books and are also facing a run-off of deposits as their customers protect themselves against a possible exit from the euro. Elsewhere it does not seem that the sum involved will greatly embarrass the banks as they will be able to raise it through retained earnings and without having to sell bank shares at what are currently very low prices. Banks in Spain, Italy, France and Portugal have the biggest targets for extra capital – of € 26.2 billion, € 14.8 billion, €8.8 billion and € 7.8 billion respectively. German banks (Deutsche Bank and Commerzbank are affected) only have to find €5.2 billion.

The assumption behind this measure is that the banks will not have to deal with further write-downs or defaults on sovereign debt, and, in particular, that contagion to Spain or Italy will not occur.

Of course the environment in which the banks function is strongly influenced by accomodating actions by the ECB.

- Accomodating Actions by the ECB: Like most central banks the ECB cut

interest rates in the financial crisis and subsequent recession, although not as much as the Federal Reserve or the Bank of England. Two interest rate rises were

made when it seemed that the eurozone economy was recovering. In an early decision under the new ECB president, Mario Draghi, one of these has been reversed. The generally low rates at which commercial banks can borrow are being passed on to their depositors but not to their debtors – thus banks will be more profitable. The ECB's mandate calls for it to support EU economic policy when this can be done without prejudice to price stability. Since the recession itself has tended to keep prices in check this creates a certain room for manoeuvre.

The arrival of Mario Draghi does seem to have led to much more resolute action to safeguard the banking system. In particular there have been two major injections of liquidity through long term loans to eurozone banks at low interest rates and with a very wide range of assets being accepted as collateral. Over a trillion euros has been taken up by banks across the eurozone in the first and second LTRO (long-term refinancing operation). Financing on such a scale and on such generous terms goes beyond the provision of liquidity – the banks will enjoy very wide margins when they lend or invest this money at interest rates well above those they are paying the ECB. In effect they are being recapitalised by their customers.

Draghi's strategy has involved considerable friction with German central bankers. There had already been the resignation of Axel Weber, head of the Bundesbank. This was followed by that of another German on the ECB executive board, Jürgen Stark, and the open dissent of Weber's successor, Jens Weidmann, as the second LTRO was carried out. German objections to such abundant refinance relate first to the danger of promoting another asset price bubble by making things too easy for the banks. This hardly seems likely when the eurozone is either in or close to recession.

German objections also relate to the indirect finance of governments through such measures. There is a grey area between the supply of liquidity and support for governments under financial pressure. Direct finance of governments by the ECB (in "primary" debt markets) is illegitimate but the ECB must have at least some presence in secondary markets because it often takes government bonds as collateral in its lending to commercial banks. (In fact, the ECB also accepts a very wide range of other securities in such lending.) Until the financial crisis, the stability of sovereign debt markets and the approximate homogeneity of paper issued by the different member states was a premise in ECB operations and therefore the need to facilitate these operations has justified a somewhat more active role for the ECB in security markets. One indication of this is the growth of the ECB balance sheet as it extends credit and purchases assets (Grahl, 2012: 4-5-6-7-8-9).

Table 14. ECB Assets in Euro Billions

	Septem-ber 2006	February 2012	% change
Gold and gold receivable	175,373	423,446	141.5
Claims in foreign currency	170,242	341,644	100.7
Claims on non-residents in euro	10,740	25,009	132.9
Lending to euro-area banks in euro	433,514	809,248	86.7
Other claims on euro-area banks in euro	9,915	72,292	629.1
Securities of euro area residents in euro	81,559	624,849	666.1
Of which: securities held for monetary policy purposes	n.a.	282,579	
other securities	n.a.	342,270	
General government debt in euro	40,021	33,926	-15.2
Other assets	197,671	352,164	78.2
Total assets	1,118,315	2,682,576	139.9

Source: Grahl (2012:9)

The growth of central bank assets in the eurozone is slightly smaller than in the US (Federal Reserve assets grew by nearly 200% in the same period to reach $2.4 trillion) but of the same order of magnitude. On the other hand, the Fed was not faced with potential defaults on the scale of those now menacing the eurozone. The

ECB has leaned against the wind in the bond markets. But its actions have so far been too little and too late to prevent either a tightening of the financial pressures on the most vulnerable states or the spread of these pressures to states which were previously unaffected (Grahl, 2012:9).

The United States could not exclude itself from the countries suffering a sovereign debt distress. The financial crisis of 2008 had very harmful effects for U.S. sovereign debt outlook.

The immediate causes of the financial crisis of 2008 are clear enough. At the center is "excessive debt leverage" or "imprudent lending," much of it in the form of complex structured credit securities that allowed banks, hedge funds, and the like to create assets composed of corporate and mortgage-backed bonds and then sell them to others, transferring the risks of borrowers' default to the buyers. Much of it was held off–balance sheet in ways not legible to investors and regulators. At a certain point in the run-up of U.S. debt relative to ability to repay, a tipping point was reached. Then anxiety about the high default risk of some financial assets and uncertainty about the location and size of potential losses made lending organizations reluctant to extend more credit to many would-be borrowers. The previously liquid market for structured credit products seized up; no one would buy, so the assets could not be priced. Financial reporting standards require firms to reduce the value of loans whose recoverability is doubtful and to alert the market to the higher risks (Wade, 2008:5).

The write-downs—and the uncertainty about how much to write down in the absence of plausible market prices—intensified a vicious circle from credit retrenchment to no credible prices to low liquidity (Wade, 2008:6).

The U.S. central bank responded to the dot.com crash of the late 1990s/early 2000s in a way that generated a huge increase in debt—or household and corporate leverage—and hence also in financial fragility. Indeed, the current crisis can indeed be seen as a legacy of the central bank's response (Wade, 2008:12).

Under the chairmanship of Alan Greenspan, the central bank (Federal Reserve) kept short term interest rates very low and stimulated the creation of liquidity, producing a credit-fueled boom. Borrowing became the only sensible way to live. The debt of households, companies, and government reached record levels relative to gross domestic product (GDP). In the UK, household debt as a percentage of post-tax income hovered around 100 percent between 1988 and 2000 and then took off to reach almost 175 percent by 2007 (Wade, 2008:13).

Much of the credit surge went into the housing market (helped along by the 1986 Tax Reform Act, which left mortgage interest as the only type that could be tax deducted). Foreign central banks, as well as domestic and foreign commercial banks, insurance companies, pension funds, and the like, bought bonds of the government-sponsored mortgage lenders Freddie Mac and Fannie Mae. They also increasingly bought asset-backed securities containing mortgages issued by private lending companies. The supply of asset-backed securities doubled between 2003 and 2004, and doubled again between 2004 and 2005. The surge of credit turbo-charged the housing market (Wade, 2008:13).

Rising demand for houses came not only from people who were previously not eligible for mortgages under the old net margin model, but also from middle-class households that discovered that—with constantly rising house prices—they could accumulate housing assets and then supplement their income by refinancing their mortgages and drawing out some of the equity. To those who worried about a

housing bubble, Greenspan said that the housing market was merely experiencing "froth" (Wade, 2008:13).

Middle-class households used the rising value of their houses to finance private health care, private education, private pensions, and the like—to finance their own private "welfare state." As they exited the public welfare state, more of them swung their support to politicians pledged to cut taxes and shrink the public welfare state to no more than a backstop for the propertyless. They had no trouble convincing themselves that their rising wealth and "self-reliance" were the fruit of their own shrewd investment strategies in the context of free markets, and they tended not to see themselves as beneficiaries of rising asset markets (Wade, 2008:13).

In short, U.S. macroeconomic policy through the 2000s has the current crisis as its legacy. The combination of high financial profits, neoliberal ideology, and a fragmented regulatory regime constrained regulators from acting to slow down the boom by, for example, raising reserve requirements on banks. The consensus was, "Let the market, let financial innovation flourish, let poor people buy their own homes." (Wade, 2008:14).

The combination of large and growing U.S. deficits and large and growing Chinese surpluses generated a surge in global credit relative to gross world product. Without the "China price," this might have blown up in the form of consumer price inflation. Instead, the credit surge blew up in the form of asset price inflation, including in property and financial assets, helped along by the originate-and-distribute business model and the fact that central banks are mandated to curb consumer price inflation but not asset price inflation. The house-price bubbles in the United States, the UK, Ireland, Spain, Australia, and New Zealand are just part of a more global property bubble over the past decade (Wade, 2008:14).

The debt-financed boom in the United States generated by years of loose monetary policy increased the United States' already large external deficit. For a decade the United States has been spending 5–7 percent more than it produces, recently importing on the order of twice as much as it exports. The deficits have been financed by fast-rising inflows of foreign capital. But for some years investors have been waiting to rush for the exit at the first sign of real trouble. Several indicators of approaching crisis showed the United States flashing red years ago. The only reason the United States escaped so long was that it is the United States, not Thailand— the biggest economy in the world, with the deepest financial markets, issuing the main international currency. Its central bank can repay debt by creating more national currency and more national debt in a way that no other country can (Wade, 2008:15).

But no country can be extended credit forever. Once the trigger was pulled, the underlying fragilities were such as to generate pervasive fear on the part of those holding financial assets, like what happens in a computer network when people hear that an aggressive virus is on the loose. The fear spread well beyond the United States because many other economies around the Atlantic and in Eastern Europe have also been running large and persistent trade deficits with the surplus producers of Asia (Wade, 2008:15).

Before the current crisis, the preceding long boom depended crucially on the international financial system's toleration of huge trade imbalances. Had the United States not consumed more than it produced—and borrowed correspondingly—the rest of the world would have expanded its industrial capacity and employment more slowly. The other side of the United States' fast growth of external debt is fast growth of world foreign-exchange reserves, most of which are still denominated in

dollars. Total foreign-exchange reserves have doubled in the past four years, increasing by as much in this period as in the previous century (Wade, 2008:15).

The fast growth of world foreign exchange reserves fueled the global credit bubble, which raised the level of global financial fragility. The bubble blew up first in one place and then in another, moving around the globe (Wade, 2008:16).

This raises the question: why do exchange rates not adjust so as to curb the external imbalances? In the simple theory that guides policy, the relative price of the currency of a large debtor country should fall, and the relative price of the currency of a large surplus country should rise, the price change prompting expenditure switches that reduce both deficits and surpluses. The market should self-adjust. Instead, we often see the opposite. In 1996–2006, countries with the biggest external deficits tended to experience appreciation of the real effective exchange rate, while countries with the biggest surpluses tended to experience depreciation. In short, the market for foreign exchange combines with the originate-and-distribute model to act as an engine of global financial instability. It enables large external imbalances to persist, which then suddenly adjust as investors and speculators rush to be first out the exit (Wade, 2008:16).

Alan Greenspan says in his autobiography, The Age of Turbulence, “I would place the U.S. current account (deficit) far down the list” of imbalances to worry about.”. His judgment stems from the conviction that “markets are an expression of the deepest truths about human nature, and as a result, they will ultimately be correct.”. Current events show his lack of concern about U.S. deficits to be a serious misjudgment. Monetary and fiscal policy could have reined in the deficit, and the world economy would have expanded more stably and more slowly. But U.S. authorities were careless about the consequences as long as the boom continued and

rates of return in the financial sector ran in the double digits, and as long as the United States could finance a guns and butter foreign policy (Wade, 2008:20).

On August 5, 2011, Standard & Poor's Ratings Services lowered its long-term sovereign credit rating on the United States of America to ''AA+'' from ''AAA''. The outlook on the long-term rating is negative. At the same time, Standard & Poor's affirmed its 'A-1+' short-term rating on the U.S. (Standard&Poor's, 2011:3).

The downgrade on the United States of America by Standard&Poor's on August 5, 2011, reflects opinion of Standard&Poor's that the fiscal consolidation plan that Congress and the Administration recently had agreed to falled short of what would be necessary to stabilize the government's medium-term debt dynamics. More clearly, the downgrade reflects the view of Standard&Poor's that the effectiveness, stability, and predictability of American policymaking and political institutions have weakened at a time of ongoing fiscal and economic challenges (Standard&Poor's, 2011:1).

Standard&Poor's lowered their long-term rating on the U.S. because they believed that the prolonged controversy over raising the statutory debt ceiling and the related fiscal policy debate indicate that further near-term progress containing the growth in public spending, especially on entitlements, or on reaching an agreement on raising revenues was less likely than they previously had assumed and was going to remain a contentious and fitful process (Standard&Poor's, 2011:3).

In August 2011, Standard & Poor's Ratings Services said that their ratings decision to lower the long-term rating on the United States to ''AA+'' from ''AAA'' was not affected by the change of assumptions about the pace of discretionary spending growth. In the near-term horizon to 2015, the U.S. net general government

debt is projected to be $14.5 trillion (79% of 2015 GDP) versus $14.7 trillion (81% of 2015 GDP) with the initial assumption. (Standard&Poor's, 2011:4).

In a longer-term horizon of 10 years, the U.S. net general government debt level with the Standard&Poor's assumptions of August 2011 would be USD 20.1 trillion (85% of 2021 GDP). With the original assumptions, the debt level was projected to be USD 22.1 trillion (93% of 2021 GDP) (Standard&Poor's, 2011:4).

The situation of France in terms of European sovereign debt crisis, is interesting. France is vulnerable to the crisis via its banks which have enormous exposures for countries having serious sovereign debt problems.

Conceptually, there are many potential channels through which sovereign rating news may have spillover effect across countries and across financial markets. One example is the holding of foreign sovereign debt by domestic banks. A sovereign rating downgrade in a given country is thus likely to affect the profitability of banks in other countries where banks are holding this debt. This is the case of Europe where banks hold at times substantial amount of sovereign debt in both their trading and banking books (Arezki, Candelon and Sy, 2011:4).

The fiscal interventions have been critical to prevent a further fall in demand and the risk of adverse feedback loops from the financial sector to the euro area economy, they have also implied a significant deterioration in the budget positions of most euro area members and ballooning government debts. From this viewpoint, the observed widening of sovereign spreads might well reflect financial markets' concerns about the solvency of national banking systems and their consequences for fiscal sustainability (Sgherri and Zoli, 2009:8).

How would Greek households finance their consumption boom? Partially at least from an extraordinary increase in public sector social expenditure, which

doubled in nominal euro terms since the introduction of the euro, bringing the share of social expenditure from 20% of GDP in 1999 to close to 30% in 2007 (Gros, 2010:8)

Table 15. Net and Gross National Savings as % of GDP in 2007

	Ire.	Greece	Spain	Italy	Portugal
Net national savings	12.2	-4.5	5.3	4.3	-4.1
Gross national savings	21.6	7.5	21.0	20.0	12.4

Source: AMECO; Gros (2010:8)

In the cases of Spain and Ireland, both of which have much higher national savings rates than Greece, the foreign debt financed mainly an excess of housing investment (Gros, 2010:9).

The factors discussed here have nothing to do with the often-heard view that in a monetary area "current accounts do not matter". It is clear that within the euro area the current account of member countries does not matter in the classic sense. However, the current account still expresses the mismatch between savings and investment. Short-term deviations from the equilibrium between these two macroeconomic variables have indeed no significance in a monetary union. Yet sustained current account deficits lead to a build-up of debt, which might become unsustainable (Gros, 2010:9).

The key for external sustainability is the difference between the interest paid on foreign debt and the growth rate of exports. As usual, the situation appeared quite comfortable during the boom, when exports were growing at a rate even slightly higher than GDP (and interest rates were low). However, the constellation has now reversed: export growth is likely to remain anaemic since the major export market is the eurozone whose growth prospects are not encouraging (Gros, 2010:9).

Japan also joined the notorious club of countries which are suffering sovereign rating cuts, as Fitch Ratings cut sovereign-rating of Japan on May 22, 2012 while the Organization for Economic Cooperation and Development (OECD) warned that the nation's debt was heading into "uncharted territory."

Fitch reduced Japan's local-currency rating one step, and foreign-currency grade two levels, to A+, the fifth-highest ranking. The Paris-based OECD said separately that boosting the 5 percent consumption levy is a "top priority."

A surge in demand for Japanese government bonds that sent 10-year yields to the lowest level since 2003 this month is masking the risks from rising debt. Prime Minister Yoshihiko Noda has failed to persuade opposition lawmakers to support his legislation, leaving gross public debt poised to reach 223 percent of gross domestic product next year, the OECD said.

It's an alarm bell for Japanese politics and the slow progress in Japan's fiscal consolidation in the sense that there's no commitment to fiscal consolidation -- in the long run, Japan's creditworthiness and fiscal sustainability aren't looking good.

Fitch went one step further than Moody's Investors Service and Standard & Poor's, which both have Japan on their fourth-highest rankings. Fitch and S&P both have a negative outlook for the nation's grade[7].

[7] Source: Bloomberg (2012). Japan Rating Cut By Fitch On Leisurely Efforts To Tame Debt, http://www.bloomberg.com/news/2012-05-22/japan-rating-cut-by-fitch-on-leisurely-efforts-to-tame-debt.htm, 22.05.2012.

CHAPTER 3: LITERATURE REVIEW ON SOVEREIGN DEBT DISTRESS

This chapter reviews the existing literature on sovereign debt distress episodes of the past decades as well as the determinants of sovereign debt distress.

The literature on sovereign debt crises falls into four broad categories: (i) theoretical models of sovereign debt and default; (ii) empirical studies of the determinants of debt crisis; (iii) empirical studies of the predictive power of credit ratings; and (iv) empirical studies of the determination of sovereign spreads. Most studies focus on a particular aspect of debt crises or particular determinants of default (Manasse and Roubini, 2005:5).

In the previous literature, the studies regarding sovereign debt are held mainly in the context of the reasons for sovereign debt crises. The two popular methods in these studies to investigate the empirical reasons for sovereign debt crises: the determinants of spreads and the determinants of ratings.

Ratings can be considered as a benchmark to compare country risk cross-sectionally. Immediate reactions on bond spreads are typical results of the transition of ratings, especially between investment and speculative grade, often as a result of consequent large portfolio rebalancing. (Andritzky, 2006:54)

There is a broad empirical literature for determinants of ratings:

Cantor and Packer (1996) find that per capita GDP, inflation, the level of external debt, and indicators of default history and of economic development are significant determinants of sovereign ratings. Karakaş, Hisarcıklılar and Ozturk (2010) examine the credit rating and the most influential economic factors affecting the cre-

dit ratings. Their study attempts to find out whether the credit ratings are biased upwards towards more developed countries.

Several studies such as Bissoondoyal-Bheenick (2005), Cantor and Packer (1996), Hu et al. (2002), Larrain et al. (1997), McNamara and Vaaler (2000) suggest that the determinants of sovereign ratings are closely similar to those of bond spreads. As these studies broadly agreed, indicators of external debt, fiscal and external balances, inflation, real growth and per capita income can largely explain sovereign credit ratings. Political variables appear to play a much smaller role in determining ratings (Haque et al. (1998), Block et al. (2003)). This may also be a result of the difficulties of measuring the effects statistically in contrast to the politics' undoubtedly pivotal importance in emerging markets. In addition to these areas, Gande and Parsley (2005) analyze the spillover effects of negative rating changes (Andritzky, 2006:55).

Cantor and Packer (1996) suggest that rating assessment itself is believed to contain additional information, despite the fact that the information contained in ratings is found to be constituted by fundamental indicators. Event studies such as Andritzky et al. (2005), Norden and Weber (2004), Reisen and von Maltzan (1999) suggest that bond spreads, in addition to other financial markets, react significantly (but not necessarily homogenously) to rating announcements (Andritzky, 2005:55). Reinhart (2002) finds that ratings are poor predictors of currency crises which are often followed by sovereign debt crises. Sy (2004) finds that, while bond spreads and ratings do not always move in coherence (Sy, 2002), rating actions are reasonable predictors of sovereign distress. Despite the fact that market players were skeptical about the quality of rating assessments a 15 years ago (Group of Ten, 1996:30), this

perception may have improved along with the expansion of the market (Andritzky, 2006:55).

For the determinants of sovereign bond spreads, a wide literature exists, too. Secondary market prices of sovereign bonds provide a continuous measure of sovereign default risk (Andritzky, 2006:55). For emerging market sovereign borrowers, bond spreads over comparable US Treasuries are an indicator of the cost of capital at which they can access international capital markets. Investors also use sovereign spreads as an indicator of sovereign risk and as a tool to gauge market assessment of a country's economic and political fundamentals. In fact, sovereign spreads are a function of the probability of default and the recovery rates in case of default. In addition, they depend on interest rate and currency risk as well as technical factors such as trading liquidity conditions and changes in the investor base for a particular country's bonds (Sy, 2002:2).

Emerging market sovereign issues have dramatically increased during the 1990s, after Mexico's bond issue in 1989, generating an increasing need for both investors and issuers to understand what factors determine bond prices and therefore also spreads (Rowland and Torres, 2004:3).

Even before the first Brady deals, early contributors such as Edwards (1986), Boehmer and Megginson (1990) analyzed the explanatory factors of risk premia in foreign loans issued by emerging countries. Edward (1986) shows that similar fundamental factors exist, via comparing the determinants of LIBOR spreads of loans and offering spreads of bonds. This is the first evidence of the similarities between the determinants of crises and ratings on the one hand, and spreads on the other. Some empirical studies rely merely on ratings as a proxy for all fundamentals (e.g., Kamin and von Kleist, 1999), relying on the fact that the close relationship between

fundamentals and credit ratings has proven the latter to be good substitute for the former (Cantor and Packer, 1996).

Taking spreads as the dependent variable gives the opportunity to estimate the ‘‘cost’’ of a change in fundamentals or ratings, such as the average increase of spreads in response to a rating change (Sy, 2004). In line with how past defaults are identified to increase spreads (Cantor and Packer, 1996), (Eichengreen and Mody, 1998b), there is some evidence pointing at differences in spreads due to regional origin (Kamin and von Kleist, 1999) or instrument characteristics (e.g., Eichengreen and Mody, 2000b,c) (Andritzky, 2006:56).

Considering sovereign bond spreads data from emerging markets spanning the period 1991 to 2000, Gande and Parsley (2005) find that a country's rating downgrade has a significant negative effect on the sovereign bond spreads of other countries. In integrated financial markets, however, one should expect rating downgrade to have effects beyond bond markets (Arezki, Candelon and Sy, 2011:4).

Yet, solely fundamental factors explain only one part of the picture. Calvo et al. (1993) refer to these as country-specific ‘‘pull’’ factors, which operate alongside global ‘‘push’’ factors. The importance of general ‘‘market sentiments’’ was recognized by a number of commentators (Eichengreen and Mody (1998b), Kamin and von Kleist (1999)). One string of the literature focused on the impact of world interest rates. While theoretical arguments suggest a straight-forward relationship, the empirical literature could not always provide unanimous evidence. Looking at capital flows to developing countries, the search-for-yield hypothesis proclaims that lower world interest rates have a positive impact on the demand for emerging market investments. Empirically, this is well supported (Dooley et al., 1994; Eichengreen and Mody 1998) but poses a difficult policy dilemma for the monetary authorities in in-

dustrialized countries, as the findings lend support to capital-flow induced boom-and-bust cycles in developing countries. Besides diluting the value of economic adjustment programs, the finding questioned the advisability of capital-account liberalization (Kenen, 1998). This discussion toned down as the empirical literature remained inconclusive about the importance of world interest rates on emerging market bond spreads (in contrast to capital flows), which are considered an indicator of market access. In theory, lower world interest rates are argued to lower risk spreads (as lower borrowing costs to the debtor decrease the likelihood of default), and increased risk appetite fuels the demand for riskier investments. Inconclusive empirical evidence in this area highlights the difficulties of spread analyses. Early studies found little evidence for the effect of world interest rates (Cline and Barnes, 1997; Kamin and von Kleist, 1999), while more sophisticated studies of secondary spreads are generally more in line with the aforementioned theory (Arora and Cerisola, 2001; Ferrucci, 2003; Uribe and Yue, 2003) (Andritzky, 2006:56).

Larrain, Reisen and von Maltzan (1997) find evidence of two-way causality (‘‘Granger-cause’’) between ratings and sovereign bond yield spreads. Yet, Reinhart (2002) interprets that, while ratings may systematically lead yield spreads, yield spreads are poor predictors of crises but better predictors of default in the sense that not all currency crises lead to default. Therefore, Reinhart (2002) suggests that ratings’ inability to explain currency crises is not inconsistent with its ability to influence spreads.

Detragiache and Spilimbergo (2001) find that liquidity indicators such as short-term debt and debt repayments due are quite good at explaining debt servicing difficulties.

As for the previous literature in the area of how spreads are determined for emerging market bonds, Edwards (1986), Haque et al. (1996) and Sachs (1985) some of the important antecedent studies (Min, 1998:3).

Sachs (1985) held a study to examine the role of various macroeconomic policies and fundamentals for the debt-crisis and constituted an economic rationale for using certain economic fundamentals in order to determine the risk-premium in international capital markets. In this study, the importance of trade and exchange rate policy is emphasized for a developing country's performance (Min, 1998:3).

In his study of bond-pricing, Edwards (1986) tested whether two markets are significantly different, by comparing the pricing of bonds and bank loans. The study found that the bond data confirm some of the most important implications of foreign borrowing models. His other finding is using data of yields on LDC bonds traded in the secondary market is that a positive effect of higher debt ratios on the risk premium exists (Min, 1998:4).

Haque et al. (1996), a more recent study, found that economic fundamentals such as the ratio of non-gold foreign exchange reserves to imports, the ratio of the current account to GDP, growth and inflation have a larger explanatory power for credit ratings, and all emerging country ratings, independent of domestic economic fundamentals, were adversely related by increases in international interest rates (Min, 1998:4).

Min (1998) analyzed the economic determinants of yield spreads on the U.S. dollar denominated, fixed-income securities of emerging markets issued during the period from 1991-1995. This study finds that certain groups of important explanatory variables for the cross-country differences in bond spreads exist. The first group of variables is related to the liquidity and solvency of an economy: the debt-to-GDP

ratio, debt-service-ratio, net foreign assets, international reserves-to-GDP ratio, which all are found to be significant and have expected signs. The second group of variables are related to the long-term insolvency of a country includes macroeconomic fundamentals such as the domestic inflation rate and terms of trade. Min (1998) suggests that the more improved a country's terms of trade the lower the bond spread while the higher the domestic inflation rate the higher the yield spreads.

Ferrucci (2003) investigates the empirical determinants of emerging market sovereign bond spreads using a ragged-edge panel of JP Morgan EMBI and EMBI Global secondary markets, and a set of common macro-prudential indicators. Ferrucci (2003) estimated the panel using the pooled mean group technique in line with Pesaran, Shin and Smith (1999). With this dynamic error correction model where cross-sectional coefficients are allowed to vary in the short run while being required to be homogeneous in the long run, a separation of short-run dynamics and adjustment towards the equilibrium becomes possible. This model is applied to the benchmark market spreads to determine whether sovereign risk was ''overpriced'' and ''underpriced'' during different periods in 1990s. According to the results, Ferrucci (2003) suggest that a country's macroeconomic fundamentals and external liquidity conditions are important determinants of market spreads. Yet, it is emphasized that a country's creditworthiness is a much more broad issue that can fully be covered by the set of fundamentals included in the model in the sense that the generalized fall in sovereign spreads between 1995 and 1997 cannot be completely explained in terms of improved fundamentals.

Min (1998) adopted the same framework of a simple valuation for the determination of the sovereign risk premium, presented and used in Edwards (1984) and Edwards (1986), to investigate the determinants of launch yield spreads on sovereign

bonds issued in the early 1990s. This framework is derived from a model that views EMEs as small borrowers in perfectly competitive financial markets. Under this assumption, a country's fair value spread is a function of the probability that it will default on its external obligations. Thus, this probability depends on a set of macroeconomic fundamentals and external shocks affecting the country's solvency and liquidity. Using this framework Edwards (1984) estimates the determinants of primary yields on bank lending to EMEs. Edwards (1986) extends this analysis running separate estimates of default risk premia in the international bank loan and bond markets. From a theoretical point of view there are a number of economic, legal and institutional reasons why one would expect risk premia on the two instruments to be priced differently. These have been widely explored in the literature, which has concluded that bond lending involves greater risks than loan lending, an intuition that is supported by the empirical findings in Edwards (1986) (Ferrucci, 2003: 8).

Several studies, for example, Baltacci, Gupta and Mati (2008), Eichengreen and Mody (1998), Kamin and Kleist (1999), Min (1998) have investigated the significance of the relationship between sovereign bond spreads and various macroeconomic indicators and variables. The empirical question in these studies is typically is whether debt and fiscal variables, reserves, GDP growth, and interest rates of various maturities play an important role in explaining sovereign bond spreads. Yet, these studies could by no means settle the debate over the stable and significant determinants of sovereign bond spreads despite the fact that they find some empirical regularity, especially in the case of specific countries and regions and for certain time horizons (Bellas, Papaionnau, Petrova, p.1).

Extensive studies of similar kind focused on the identification short-and long-term causes of sovereign bond spreads with a dynamic error correction model such as

Dell'Aricia, Goedde, and Zettelmeyer (2000), Ferrucci (2003) and Goldman Sachs (2000). Ferrucci (2003) presents a conclusion that markets take into account macroeconomic fundamentals when pricing sovereign risk. The external debt to GDP ratio, the degree of openness, the ratio of amortizations to reserves, and the ratio of current account to GDP are all found to be significantly correlated with sovereign spreads, the interest rate payments to external debt ratio and the fraction of short-term external debt are also correlated with sovereign spreads but weakly. Ferrucci also finds that no fundamental factors play an important role in the context of the strong empirical relationship between sovereign spreads and external factors such as global liquidity conditions and U.S. equity prices. (Bellas, Papaionnau, Petrova, p.2)

In line with previous research, Kamin and Kleist (1999) suggest that sovereign primary yields in bond and loan markets are related to borrowers' creditworthiness as summarized by the credit ratings issued by the major rating agencies, controlling for instrument characteristics. The main feature of this study is that macroeconomic, liquidity and solvency indicators are not included in the estimating equation. This reflects the well-established result that ratings are highly correlated to a small set of macroeconomic fundamentals and so adding both sets of variables would lead to multicollinearity, for instance presented by Cantor and Packer (1996). Kamin and Kleist (1999) leads to the conclusion that EME spreads have strong and well-defined relationships with credit ratings and thus with borrower creditworthiness. This study also finds that borrowers in Latin America and Eastern Europe are systematically charged higher spreads than borrowers in Asia and the Middle East (Ferrucci, 2003:8).

The second conclusion of Kamin and Kleist (1999) is that spreads on emerging instruments have strong and well-defined relationships to credit rating, maturity

and currency denomination. It is also determined that Latin America and eastern Europe have been charged by higher spreads than borrowers in Asia and the Middle East. (Kamin and Kleist, 1999:41)

For instance, based on the selected set of fundamentals, the model of Ferrucci (2003) predicts that sovereign risk in Bulgaria should be around 450 basis points, roughly the same level as in Peru. By contrast, market spreads in the former are around 220 basis points lower than in the latter. But there is no clear-cut reason to view Bulgaria as more creditworthy than Peru. Both countries (which have roughly similar per capita income) have recorded similarly low inflation rates and a relatively stable exchange rate in recent years. They have sustained restrained fiscal policy under IMF led economic programmes, and the fiscal deficit has been steadily declining. On the plus side, Bulgaria is more open to foreign trade and has higher foreign reserves relative to GDP than Peru. But Peru's external indebtedness is lower than Bulgaria's and on average its external debt is of longer duration. Moreover, Peru's external financing needs and current account deficit are also lower. The same line of argument may be applied to Morocco and the Philippines (Ferrucci, 2003:26).

Kamin and Kleist (1999) concluded that Brady bonds which remain the most common index of emerging market spreads did not represent similar trends in terms of credit spreads in line with the ones in all emerging market credit spreads. Brady bond spreads are considerably higher than average emerging market spreads, reflecting the relatively low credit of their issuers. And during the Mexican financial crisis, the volatility in the spreads on the many investment grade emerging market credits issued at the time (Kamin and Kleist, 1999:41).

As for credit spreads over the course of the 1990s, Kamin and Kleist (1999) determined that the spreads on emerging market debt instruments declined in the

years ahead of the Asian financial crisis by more than the improvements in risk factors, credit ratings and maturity alone can explain (Kamin and Kleist, 1999:42).

In addition, Kamin and Kleist (1999) pointed that spreads declined throughout the 1990s until the Asian Crisis cannot be attributed to the declines in industrial country interest rates due to the fact that there is no, robust, statistically significant relationship between various measure of industrial country interest rates and emerging market new-issue bond spreads.

A common characteristic of past studies is that they use primary yields as a measure of credit risk, a feature that may lead to sample selection biases. As observed in Eichengreen and Mody (1998a, 1998b) in poor market conditions, when secondary spreads rise, primary spreads do not rise proportionately, and in some cases they fall. Factors that increase the perceived risk of EME debt, while raising secondary market spreads, may have the opposite effect on launch spreads in so far as riskier borrowers are rationed out of the market, leaving only low-risk borrowers to launch new issues. As a consequence, a sample of primary yields may not be entirely random and estimates based on it may be biased (Ferrucci, 2003:13).

One way to correct for this bias is to model primary yields simultaneously with a binary decision to issue or not to issue (Eichengreen and Mody (1998a, 1998b)). In practice, this method involves defining a Heckman correction model that accounts for the joint determination of the issue and pricing decisions, controlling for selectivity. This amounts to jointly estimating a two-equation model, including a 'traditional' linear relationship between launch spreads and a set of fundamentals, and a probit equation to account for the fact that spreads will only be observed when positive decisions to borrow and lend are made. The cost of this modeling strategy is that the database has to be supplemented with information on non-issuing countries,

to allow estimation of the probit equation. The model provides clear evidence that bond issuance is not a random event and that selectivity biases can be significant when estimating a model of primary issues. For example, once these factors are taken into account, Eichengreen and Mody find that interest rates in developed countries become an important determinant of capital flows to EMEs –contradicting the findings in Kamin and Kleist (1999). Another way to correct for sample selectivity is to use secondary market spreads, which do not suffer from this type of bias. A few recent papers have done this. Goldman Sachs (2000) estimate a long-run equilibrium model of EME sovereign spreads using monthly data from quotes of benchmark, long-maturity, sovereign bonds, which increase the length of the time series but raise issues about which bond to choose and how representative it is. To estimate their model, Goldman Sachs (2000) adopt the pooled mean group technique developed by Pesaran, Shin and Smith (1999), which involves defining a dynamic, error correction panel where short-run parameters are allowed to vary by cross-sections, while long-run elasticities are restricted to be identical across groups. Dell'Ariccia, Goedde and Zettelmeyer (2000) use EMBI Global spreads to assess the presence of moral hazard in international lending following the Russian crisis in 1998. The benefit of using EMBI Global spreads is that these are a balanced panel of readily available secondary market spreads, and that they are more broad-based than benchmark bonds. But there is a disadvantage in that time series are shorter (the EMBIG series starts in 1997). Estimates are obtained using a conventional, static, fixed-effect model. But for a robustness check, the model is also run on a database of launch spreads which has broader country coverage than the EMBIG, correcting for the selectivity bias using a Heckman correction algorithm, as in Eichengreen and Mody (1998a, 1998b). Both Goldman Sachs (2000) and Dell'Ariccia *et al* (2000) need to interpolate their

macro fundamental databases to obtain a sufficiently high number of observations, raising the issue of the appropriateness of doing so. Clearly, interpolation increases the sample size at the cost of imposing a given (in most cases, linear) model on the data generating process of the missing observations (Ferrucci, 2003:13).

Ferrucci (2003) uses the same database as Dell'Ariccia *et al* (2000), thus getting around the sample selection problems encountered in earlier literature, and the pooled mean group estimation technique used in Goldman Sachs (2000). However, Ferrucci (2003) are careful in considering the implications of merging the EMBI and EMBI Global data sets, which rises quite, separate selectivity issues than the previous literature on primary yields. Ferrucci (2003) also attempts to minimize the need to interpolate macroeconomic series by using information from individual central banks and Ministries of Finance – thus building as high a frequency data set of macro fundamentals as possible (Ferrucci, 2003:14).

Rowland and Torres (2004) aims to identify the main economic determinants of both of the spread of emerging markets sovereign issues and of the creditworthiness of the issuer, with the assumption that the two should be closely connected. A panel data framework and a sample of 16 emerging market countries are used in their study. They used annual time-series data for the period 1998 to 2002 when analyzing the spread, and from 1987 to 2001 in the case of creditworthiness. The results of the study suggest that the spread and the creditworthiness have some common significant explanatory variables such as economic growth rate, the debt-to-GDP ratio, and the debt-to-exports ratio. Indeed, the spread is also determined by the exports-to-GDP ratio and the debt service-to GDP, while the creditworthiness has also significant determinants such as inflation rate and a default dummy variable.

In an analysis of Rodrik (2005) including emerging markets (namely Argentina, Brasil, Chile, China, Colombia, Egypt, India, South Korea, Malaysia, Mexico, Morocco, Pakistan, Peru, Philippines, South Africa, Thailand and Turkey), it is stated that weighted average of short-term debt-to-reserves ratios of these countries decline from at 1.11 in 1990 to at 0.27 in 2004 while unweighted average of short-term debt-to-reserves ratios decline from at 1.93 in 1990 to 0.56 in 2004. This points that liquidity conditions have advanced for emerging countries between the years 1990-2004. Weighted average of short-term debt-to-GDP ratios of these countries increased from at 5.4% in 1990 to 6.1% in 2004, as unweighted average of short-term debt-to-reserves ratios increased from at 6.5 to 8.4 throughout the same period. Meanwhile, reserves-to-GDP ratios witnesses a huge increase. Weighted average of reserves-to-GDP ratios of these emerging market countries increased from 4.8% in 1990 to 22.5% in 2004. The unweighted average average also rose to 15.0 % in 2004 from 3.4% in 1990 (Rodrik, 2005:22). Thus, emerging countries have meant to accumulate considerable international reserves.

Sy (2002) uses a panel data estimation of a simple univariate model of sovereign spreads on ratings to analyze statistically significant differences between actual spreads and ratings-based spreads. When such deviations are significant, we find that ‘‘excessively high’’ spreads are on average followed by episodes of spread tightening 1 month later rather than credit downgrades. In contrast, observations with ‘excessively low’ spreads are on average followed by rating upgrades 3 months later rather than episodes of spread widening. The paper also illustrates how significant disagreements between market and rating agencies’ views can be used as a signal that further technical and sovereign analysis is warranted. For instance, we find that spreads were ‘excessively low’ for most emerging markets before the Asian crisis.

More recently, spreads were ‘‘excessively high’’ for a number of emerging markets (Sy, 2002:1).

In the previous studies, generally held by panel data models, determinants of spreads are examined and various results leading to various conclusions are obtained. The results, in principle, suggests that a country’s ‘‘macroeconomic fundamentals’’ and ‘‘external liquidity conditions’’ are important determinants of sovereign spreads. ‘‘Debt-to-GDP ratio’’, ‘‘current account balance-to-GDP’’, ‘‘GDP growth rate’’ and ‘‘credit ratings’’ are the most common variables in all these studies to have been found to be significant in explaining sovereign debt spreads. Yet, in my study, regardless of that the popular dependent variable was sovereign yield spreads in past papers, as dependent variable I take CDS spreads which are modern modern indicators in terms of sovereign default risk valuation.

In the next chapter, data and methodology for estimation issues are given. The hypotheses that are tested are also set.

CHAPTER 4: METHODOLOGY AND DATA

In this section, major macroeconomic fundamentals in affecting the risk of sovereign default for a sample of 12 developed (DCs) and eight emerging countries (EMs) are analyzed over the period of 1993-2011. Quarterly panel data are employed and the sample is disaggregated as DCs, EMs and European Countries with sovereign default risk in the study. Since the crisis of 2008 has affected the developed and emerging economies differently, the sensitivity analysis should also provide an insight for this period for different groups of countries empirically. Ordinary Least Square (OLS) is employed for three groups of the sample. The model is as follows:

$$Y_{it} = B_{1it} + \Sigma B_{kit} X_{kit} + e_{it}$$

where Judge et. al. (1985) refers to the countries in the sample as i = 1, 2, … , N while t = 1, 2, … , T refers to a given period of time and k = 1, 2, … , K refers to the different explanatory variables. Therefore, the value of the dependent variable is denoted by Yit. In the study Yit is the interest rate spread of the country i at time t. Indeed, Xkit is the value of the k-th non-stochastic determinant for the country i at time t. And also, the assumption of zero mean and constant variance for the stochastic error term eit is considered. The response coefficients as denoted by the parameter Bkit are unknown and most of the cases they can vary for different countries i in different time periods t.

Major determinants for sovereign debt default risk (SD) are categorized as country's fundamentals and defined as solvency (S), liquidity (L) and external shocks (E) as follows:

$$SD_{it} = f(S_{it}, L_{it}, E_{it}) \qquad (1)$$

where subscripts *i* and *t* denote country and time period, respectively.

Solvency variables imply a country's ability to pay in the long-run, which include GDP growth, fiscal and current account balances, and stocks of public and ex-

ternal debts (Ades, Kaune, Leme, Masih and Tenengauzer, 2000:3). Measures related to debt ‘‘solvency’’ are important since high levels of external debt with respect to a measure of the ability to pay such as GDP increase the probability of a default and entry into default (Roubini, Manasse and Schimmelphennig, 2003:4).

Measures related to ‘‘liquidity’’ (in fact, measures of illiquidity) are particularly short-term debt (relative to foreign reserves) (Roubini, Manasse and Schimmelphennig, 2003:4).

Measures related to external shocks are liquidity and monetary conditions in the Group of seven countries.

Based on the studies of the Compilation Guide on Financial Soundness Indicators (IMF, 2004), a set of Xi’s for the model with 11 independent variables are grouped as:

$$CDS_{it} = \beta_0 + \beta_1 GDPG_{it-1} + \beta_2 CABGDP_{it} + \beta_3 TEDGDP_{it} + \beta_4 BBGDP_{it} + \beta_5 INT_{it} + \beta_6 PEDFR_{it} + \beta_7 PFBGDP_{it} + \beta_8 TFXR_{it} + \beta_9 STDR_{it} + \beta_{10} CPI_{it} + \beta_{11} TBILL_{it} + \varepsilon_{it} \quad (2)$$

where subscript i denotes countries and t represents time period.

There are two main obstacles in conducting empirical research on emerging countries: (1) the limited availability of reliable time series data (Hoskisson et.al 2000; Samoilenko & Bryson, 2011) and the lack of clear consensus for the definition of emerging, developing, and transition economies in the literature (Samoilenko, 2008). In this study, some variables such as budget balance to GDP and public external debt to fiscal revenue ratio as indicators of solvency, as well as primary fiscal balance, primary fiscal balance to GDP and short-term debt to reserves ratio as indicators of liquidity are eliminated due to the lack of consistent quarterly data. On the other hand, the countries in the sample are clearly perceived as emerging markets.

The dependent variable is defined as interest rate spread (CDS) in the model to measure the severity of a sovereign debt crisis or a sovereign debt default risk. CDS spreads are considered a more direct measure for the probability of default than the credit ratings of the credit rating agencies. Goldstein, Kaminsky and Reinhart (2000) suggest that credit ratings should help predict crises because macroeconomic indicators have some predictive power, as sovereign ratings use all available information on economic fundamentals. In fact, credit ratings themselves include per capita income, GDP growth, inflation, fiscal balance, external balance, external debt, economic development as determinants (Cantor and Packer, 1996:3). Yet, sovereign credit ratings are usually criticized for their poor predictive power.

Table 16. Percentage Distribution of Credit Ratings by Income Level

Rating	Low&middle income	High income	Pooled
B3	4.92	0.00	2.41
B2	8.66	0.00	4.25
B1	13.8	0.00	6.76
Ba3	6.89	0.00	3.38
Ba2	11.1	0.00	5.69
Ba1	14.96	1.33	8.01
Baa3	12.80	2.84	7.72
Baa2	8.07	4.55	6.27
Baa1	6.89	4.92	5.89
A3	3.35	6.06	4.73
A2	6.89	8.71	7.82
A1	1.18	10.61	5.98
Aa3	0.00	6.44	3.28
Aa2	0.00	10.04	5.12
Aa1	0.00	5.11	2.61
Aaa	0.00	39.39	20.08
Total	100	100	100

Source: Karakaş, Hisarcıklılar and Öztürk (2010:17)

Table 17. Moody's Rating Distribution of Sovereign Issuers on Selected Dates

	1983	1990	1995	2000	2005	2008

Aaa	75%	40%	20%	14%	20%	18%
Aa	25%	30%	26%	14%	5%	11%
A	0%	17%	20%	13%	24%	19%
Baa	0%	3%	13%	21%	14%	13%
Ba	0%	7%	15%	17%	15%	16%
B	0%	3%	7%	16%	17%	20%
Caa-C	0%	0%	0%	5%	4%	3%
Investment-Grade	100%	90%	78%	62%	64%	61%
Speculative-Grade	0%	10%	22%	38%	36%	39%

Source: Moody's (2009:4)

As can be seen from the table 17 above, by the end of 2008 the share of investment-grade sovereign issuers had declined to a little over 60 percent. While all rated sovereign issuers in 1983 were investment-grade, recently riskier emerging market countries have gained access to debt markets. In addition, as more sovereign issuers have obtained Moody's ratings, the rating distribution for sovereign issuers has become more similar to that of the corporate bond issuers. The sovereign rating mix had drifted upward between 2000 and 2005-2006, as the share of sovereigns rated investment grade had climbed modestly. However, in 2007-2008 the share of Aaa and A-rated sovereigns declined slightly. In 2008, the mode of the rating distribution is at Baa (Moody's, 2009:4). In addition, the credibility of the rating agencies has also been debated with the crisis of 2008. Therefore CDS spreads are chosen as an indicator for sovereign debt default risk in the study. The definition of ''the yield spread of a U.S. denominated bond'' is the difference in the yield between this bond and a benchmark U.S. treasury bond of the same maturity. Spreads are typically expressed in basis points which equals to 1/100 of a percent (Rowland and Torres, 2004:5). Five-year CDS data of countries are used, due to the higher liquidity of 5-year CDSs.

The correlation among the available data is tested and the variables with r>0.6 are eliminated with stepwise analysis (Table 18).

Table 18. Correlations Among Variables Used in the Analysis

	CDS	GDPG	CABGDP	TEDGDP	INTR	TFXR	CPI	USTBills
CDS	1.00	-0.310	-0.321	-0.065	0.564	0.354	0.581	-0.434
GDPG		1.000	0.825	-0.054	0.183	0.068	0.100	0.321
CABGDP			1.000	0.225	0.076	0.0007	0.013	0.289
TEDGDP				1.000	-0.256	-0.123	-0.111	-0.045

High correlation (0.82) between GDP growth rate and the ratio of current account balance to GDP is seen. As GDP increases, current account imbalance rises. CPI inflation rate is correlated with interest rate (0.70) and total foreign exchange reserves (0.62).

Based on the correlation findings, the variables in the model are reduced with stepwise analysis and the base model is obtained as follows.

Model I

$$CDS_{it} = \beta_0 + \beta_1 GDPG_{it-1} + \beta_2 CABGDP_{it} + \beta_3 TEDGDP_{it} + \beta_4 INTR_{it} + \beta_5 TFXR_{it} + \beta_6 CPI_{it} + \beta_7 TBILL_{it} + \varepsilon_{it} \quad (2)$$

Model II

$$CDS_{it} = \beta_0 + \beta_1 CABGDP_{it} + \beta_2 TEDGDP_{it} + \beta_3 TFXR_{it} + \beta_4 CPI_{it} + \beta_5 TBILL_{it} + \varepsilon_{it} \quad (3)$$

Independent variables are defined as GDP growth rate, current account balance-to-GDP ratio, total external debt/GDP ratio, interest rates, total foreign exchange reserves, CPI inflation and U.S. treasury bills rate (Table 19). The CDS data between 2000 and 2010 is derived from Bloomberg. The full dataset includes quarterly information on OECD countries within the time range of 1993 and 2011.

Table 19. Determinants of Sovereign Debt Distress

Determinant	Proxy Variable	Source	Expected Effect
Solvency	GDP growth rate (GDPG)	OECD	(-)
	Current account balance to GDP (CABGDP)	OECD	(-)
	Total external debt / GDP ratio	OECD	(+)
	Interest rates	OECD	(+)
Liquidity	Total reserves	OECD	(-)
	CPI inflation	OECD	(+)
External Shocks	U.S. treasury bills rate	FED	(+)

In the model, GDP growth refers to quarterly statistics of GDP change. The higher the GDP growth the stronger the countries' fiscal position, making it easier for the country to transfer the necessary resources for external debt, if everything else remains constant (Ades, Kaune, Leme, Masih and Tenengauzer, 2000:5). A stronger fiscal position makes the country's debt burden become easier to service over time (Rowland and Torres, 2004:20). Therefore, the sign of the coefficient for GDP growth is expected as negative.

There is a strong link between currency crises and default in emerging market economies (Detragiache and Spilimbergo, 2001). A currency crisis triggered by overvaluation can result in severe balance sheet effects if a large part of the debt is in foreign currency since the stock of debt can sharply increase in real terms after a large currency crisis (Roubini and Manasse, 2005). Hence if credit ratings are forward-looking and currency crises in emerging market economies are linked to defaults, it follows that downgrades should systematically precede currency crises (Reinhart, 2002:2). Thus current account imbalances are assumed to be deterministic to assess the determinants of debt crises, especially when debt denominated in foreign currency over total debt ratio is high. Current account balance to GDP is included in the model to capture this relation. The expected sign is negative.

External debt is the total liabilities of a country with foreign creditors, both official (public) and private. Creditors often determine all the terms. Roubini, Manasse and Schimmelphennig (2003) find that countries having an external debt which is greater than 50 percent of their GDP are more likely to default. Moreover, Reinhart, Rogoff and Savastano (2003) measured a pairwise correlation of 0.55, between external debt-to-GNP and EMBI Spreads in some of the major emerging countries, and concluded that this correlation is statistically significant at the five percent confidence level. Therefore, the sign for the coefficient of external debt/ GDP is expected as positive.

Indeed, that a lack of external liquidity during the crises makes the reversal in capital flows sudden and dramatic in a way that is out of proportion with observed changes in basic economic fundamentals. For example, during both the Mexican and Asian crises, economists noticed that these countries had large short-term external liabilities which are not matched by foreign assets of similar characteristics and hypothesized that lack of external liquidity made these countries particularly vulnerable. This observation led to a policy conclusion of avoiding excessive short-term exposure (Detragiache and Spilimbergo, 2001: 2).

On average, crisis countries have higher external debt and higher share of short-term debt several years before the crisis occurs, which increase sharply as the crisis approaches. However, foreign exchange reserves have the opposite behavior. Consequently, the expected sign for total foreign exchange reserves is negative.

Inflation is symptomatic of problems at the macroeconomic policy level, especially if caused by monetary financing of deficits (Afonso and Gomes, 2010:6). Reinhart and Rogoff (2010) identify that inflation raises sharply as debt increases for

emerging markets. Therefore, CPI inflation is included in the model and the expected sign is to be positive.

U.S. interest rates are a suitable variable for accessing global monetary conditions as well as for its effects on countries' interest rate spreads. Since the U.S. GDP represents an important fraction of the total GDP of G-7 countries, as well as the fact that U.S. dollar is the major reserve currency, U.S. treasury bills rates will give us some clue about global liquidity conditions. Despite the fact that Reinhart (2002) finds that credit rating agencies do not seem to take external liquidity into account when assigning sovereign ratings, increased capital flows to emerging countries in 1990s led a dramatic decline in interest rate spreads while contributing countries' vulnerability to sudden reversal in investor sentiment and unprecedented turbulence. In past episodes, the considerable shifts in U.S. monetary policy coincided with a market turbulence (for example, in 1994 and 1998). In an environment of increased integration in global capital markets, changes in monetary policy in major economies (particularly changes in U.S. monetary policy as the biggest economy of the world) have direct effects for emerging countries on the cost and availability of funds, and their creditworthiness. Besides, interest rate spreads (the differences between yields on sovereign bonds of emerging countries and U.S. treasury securities of comparable maturities), which are a proxy with country risk, tend to move in the same direction with changes in U.S. interest rates (Arora and Cerisola, 2001:2).

In parallel to most theoretical models in the literature, specification of determinants of the probability of default are tied to macroeconomic fundamentals like solvency, liquidity and external shocks. The econometric model analyses the

major determinants of sovereign debt default risk with the available data for the period of 1993 and 2011 to test the following hypotheses

Hypothesis 1: The major determinants of sovereign debt default differs in the developed and emerging countries.

Hypothesis 2: Current account balance is an important and negatively related indicator with sovereign debt default risk.

Hypothesis 3: Total external debt is positively related with sovereign debt default risk.

Hypothesis 4: Total foreign exchange reserve is negatively related with sovereign debt default risk.

Hypothesis 5: U.S. Treasury bills is positively related with sovereign debt default risk.

CHAPTER 5: EMPIRICAL FINDINGS

The major determinants of sovereign debt default risk is analyzed by employing Ordinary Least Square (OLS) Model. As a first step, the sensitivity of fundamental factors such as solvency, liquidity and external factors are tested simultaneously. As a second step, high values for some pairwise correlations among independent variables are taken into account. Highly correlated variables are dropped from the initial model. As a third step, the sample is disaggregated as developed countries, emerging countries and troubled EU countries. Developed countries are Australia, Belgium, Canada, France, Germany, Greece, Ireland, Israel, Italy, Japan, Portugal and Sweden. The sample of emerging countries cover Brazil, Hungary, Indonesia, S.

Korea, Mexico, Russia, S. Africa and Turkey. Belgium, Greece, Ireland, Italy and Portugal are classified as the European countries with sovereign debt default risk.

The econometric estimation of OLS Model for Model I and Model II for different sets of countries over the period 1993-2011 is presented in Table 20.

Table 20. OLS Model for the Major Determinants of Sovereign Debt Default Risk

	All Countries		Developed Countries		Emerging Economies		EU Countries with Default Risk	
	Model I	Model II	Model I	Model II	Model I	Model II	Model I	Model II
Constant	50.38***	118.03 ***	- 135.81***	55.703***	236.76***	313.75***	-440.64***	192.12***
	(7.899)	(15.411)	(-11.020)	(4.522)	(12.798)	(17.067)	(10.098)	(7.959)
GDPG	11. 687	-	-44.956***	-	-	-	-2.997	-
	(1.614)		(-6.578)				(-0.317)	
CAPGDP	-10.330	-2.772***	-1.156	-1.661***	-36.252***	-26.404***	1.633	-2.337***
	(-1.427)	(-25.575)	(-0.190)	(-15.093)	(-5.956)	(-3.914)	(0.173)	(-19.417)
TEDGDP	0.014	-0.009	-0.098***	0.309***	0.053	0.071	-0.079	-0.103
	(0.461)	(-0.257)	(-3.839)	(5.217)	(1.019)	(1.216)	(-1.603)	(-1.412)
INTR	-0.221	-	47.133***	-	-0.175***	-	124.218***	-
	(-14.496)		(16.174)		(-8.806)		(15.570)	
TFXR	0.0004***	-0.0001**	0.0001***	-0.0001	0.204	-0.0003**	0.0006	-0.0040***
	(6.173)	(-2.333)	(5.582)	(-1.662)	(0.018)	(-2.703)	(0.656)	(-2.897)
CPI	-0.031	-0.145***	-0.096***	-0.528***	-0.020	-0.014	0.017	-0.502***
	(-1.133)	(-3.902)	(-4.156)	(-10.409)	(-0.367)	(-0.228)	(0.316)	(-7.363)
TBILL	-0.069	0.017	0.037	2.895***	-31.033***	-36.830***	-14.815**	-42.351***
	(-0.747)	(0.099)	(0.647)	(25.474)	(-5.885)	(-6.243)	(-2.716)	(-5.315)
Adjusted R-Squared	0.97	0.54	0.97	0.80	0.36	0.20	0.93	0.84
R-squared	0.97	0.55	0.97	0.80	0.37	0.19	0.93	0.85
F [.,.]	[7, 712]	[5, 714]	[7, 424]	[5, 426]	[6, 281]	[5, 282]	[7, 172]	[5, 174]
	3965	171	2276	355	28.58	14.78	371.53	197.65
Log likelihood	-4246	-4744	-2471	-2922	-1831	-1866	-1103	-1182

First of all, the explanatory power of Model I, R-square, increases significantly in all sub-groups as well as the whole sample. The striking feature is that major indicators of sovereign debt default have a strong effect in both models for the developed countries and the European countries with default risk. Models seem to fail in capturing major indicators for sovereign debt default for the emerging countries. The calculated F values in all versions of estimations are higher than the one percent critical value from F Table.

The coefficients measure magnitude of the effect coming from explanatory variables of solvency, liquidity and external shocks on sovereign debt default risk. The effect of GDP growth is negative, as it is expected, for developed countries and the troubled EU countries. However, it is positive for the whole sample. The coefficient of GDP growth is negative and statistically significant at 1% level for the developed countries. This implies that economic growth is an important determinant that averts sovereign debt default in the developed countries.

The sign of current account balance is expected as negative, indicating that well-managed current account balance should have a positive impact on sovereign debt default. Empirical results confirm this expectation in all versions of the sub-groupings except Model I for the European countries with default risk. The remarkable finding is that the coefficient of CABGDP is statistically significant at 1% level in the base model which is Model II. This shows that there is a close relationship between current account balance and sovereign debt default for all countries.

Total external debt to GDP is expected to have positive sign. The higher external debt of a country, the higher the risk of debt default is. Empirical findings confirm the relationship in the base model for the developed and emerging countries.

It is statistically significant at 1% level in the sample of developed countries, highlighting the fact that external debt is a very important determinant in the developed countries. Surprisingly, it is negative for the European countries with default risk but it is insignificant.

The sign of the coefficient for interest rate is inconsistent in different sub-groupings. It is dropped in base model due to correlation problem. In model I, it is statistically significant at 1% level except the whole sample. The striking difference is that it is positive for the developed countries and the European countries with default risk whereas it is negative for the emerging countries. Therefore, results might imply that rising interest rates may be an important determinant in advanced countries but it is not that important in the emerging countries.

The impact of total foreign exchange reserves on sovereign debt default is found to be negative in the base model as it is expected. It is statistically significant at 1% level for the European countries with default risk and 5% level for the emerging countries and the whole sample. Total foreign exchange reserve is an important indicator for liquidity, especially in emerging economies. The insignificant negative relationship can be due to characteristics of the developed countries in the sample. The share of gold is higher than foreign exchange reserves in most of the developed countries. The noticeable difference is in the European countries with default risk, liquidity is also an important determinant on sovereign debt default risk in these countries.

Surprisingly, CPI, inflation rate, has a negative impact on sovereign debt except Model I for the European countries with default risk. It is significant at 1% confidence level in the base model for the whole sample, developed countries and the

European countries with default risk. It is not significant in the sample of emerging countries.

The explanatory variable of U.S. Treasury bills have expected positive effect on sovereign debt default as it is expected in the whole sample and the developed countries. Though, they show difference in terms of significance. It has negative sign for the emerging countries and the European countries with default risk and statistically significant at 1% confidence level. This finding indicates that the higher U.S. Treasury bills, the higher the risk of default is in the developed countries but not in emerging countries.

In summary, OLS approach is used to clarify the major determinants of sovereign debt default risk for the developed, emerging and a group of the European countries with default risk for the period of 1993-2011. Main findings are as follows:

- Empirical results reveal that determinants of sovereign debt default risk differ according to characteristics of country groups as developed and emerging.
- The coefficient of current account balance to GDP is always negative in the base model for all sub-groupings, indicating that current account balance should be managed properly to avoid sovereign debt default.
- The impact of total external debt to GDP is found to be important determinant that affect sovereign debt positively in both developed and emerging countries.
- The impact of U.S. Treasury bills on sovereign debt default are found to be different for developed and emerging countries. The empirical findings indicate that the higher U.S. Treasury bills, the higher the risk of default is in the developed countries but not in emerging countries.

CHAPTER 6:CONCLUSION

Past two decades witnessed frequent sovereign debt-servicing difficulties and outright defaults. Following the global crisis of 2008, several European countries found theirselves in a sovereign debt distress. Especially PIIGS (which is an abbreviation denoting the first letters of Portugal, Ireland, Italy, Greece and Spain respectively) suffered severe sovereign debt crises, as their CDS spreads skyrocketed due to the stagnancy in their economies as well as a lack of confidence in these countries' fiscal sustainability. The Greek case is the most dramatic one. By the end of 2011, Greece became insolvent and came very close to a sovereign default. The country avoided a disastrous default, by the help of a sovereign debt restructuring accompanied by a debt hair-cut, designed by the EU. Yet, the European debt crisis still goes on.

According to Manasse and Roubini (2005), sovereign debt crises are not identical regarding whether government faces insolvency, illiquidity or macroexchange rate risks. When rating a country, also each rating agency gives more emphasis to some certain specific variables than other ones. For example, Moody's focus more on government deficit, whereas S&P and Fitch gives more emphasis to government debt (Afonso and Gomes, 2010).

In principle, there is a strong link between currency crises and default in emerging market economies (Detragiache and Spilimbergo, 2001). Crises such as Mexico 1994-95, Korea and Thailand 1997-98, Brazil 1999 and 2002, and Turkey 2001 have sources in debt-servicing difficulties in the short-term maturities of external or domestic debt obligations of the sovereign or of the private sector. In

these cases, problem is illiquidity rather than excessive debt associated with a clear insolvency situation (Roubini and Schimmelphennig, 2003).

Emerging countries usually have some additional problems to developed countries, with respect to sovereign debt, such as ‘‘currency mismatches’’, ‘‘debt intolerance’’ and ‘‘original sin’’.

Infamous default episodes of Russia in 1998 and Argentina in 2001, are among major sovereign debt defaults in emerging markets countries in past two decades. After the financial crisis of 2008, Iceland defaulted on its debt. Iceland's sovereign default at the end of 2008, was surprising since the country was regarded as a developed country at the time. Following Iceland's default, PIIGS appeared to have severe sovereign debt distress, suffering rating downgrade after downgrade. These countries have received several successive rescue packages. By the end of 2011, Greece became insolvent with a risk of sovereign default but the EU came to help. In February 2012, Greece enjoyed a sovereign debt restructuring and a debt hair-cut, orchestrated by the EU. Also even some major developed countries including U.S., France and Japan suffered sovereign rating downgrades in 2011 and 2012.

The aim of this study is to determine the major indicators of a debt crisis for major developed and emerging countries over the period of 1993-2011. Ordinary Least Square (OLS) Model is employed to determine the sources of debt crisis and compare the performances of countries, with quarterly panel data. First, the sensitivity of fundamental factors such as solvency, liquidity and external factors are tested simultaneously. Second, high values for some pairwise correlations among independent variables are considered, in order to drop highly correlated variables from the initial model. Third, sample is disaggregated as developed countries,

emerging countries and European countries with default risk. The coefficients measure magnitude of the effect coming from explanatory variables of solvency, liquidity and external shocks on sovereign debt default risk.

Main empirical findings and policy implications of the study for twelve developed and eight emerging countries (Australia, Belgium, Canada, France, Germany, Greece, Ireland, Israel, Italy, Japan, Portugal, Sweden, Brazil, Hungary, Indonesia, S.Korea, Mexico, Russia, S. Africa and Turkey) can be summarized as follows:

- One of the most important conclusions of our empirical study is that determinants of sovereign debt default risk differ according to characteristics of country groups as developed and emerging. Consequently, policies to be initiated to avert a sovereign debt crisis should differ across developed and emerging countries.

- The effect of GDP growth is negative, as it is expected, for developed countries and the troubled EU countries. However, it is positive for the whole sample. That coefficient of GDP growth is negative and statistically significant at 1% level for the developed countries implies that economic growth is an important determinant that averts sovereign debt default in the developed countries. This means that stagnant GDP growths is more dangerous for developed countries to result in a sovereign debt crises than for emerging countries.

- Policies to support GDP growth, is, therefore, a very useful measure to fight a sovereign debt distress in the troubled EU countries. As is now the case, EU coutries suffering debt crises (especially PIIGS) that have stagnant GDP growths

should develop economic policies to promote GDP growth. Unfortunately, high budget deficits are obstacle for considearble Keynesian stimulus packages.

- Yet, GDP growth is much more important for developed countries in terms of preventing a sovereign debt distress. Policy makers especially in developed countries, such as Australia, Belgium, Canada, France, Germany, Japan and Sweden should dedicate significant attention to create considerable GDP growth to avert a future sovereign debt crisis.

- That total external debt to GDP is significant for developed countries means that total external debt-to-GDP ratio is really important for developed countries in explaining sovereign debt distress. This fact implies that high total external debt-to-GDP ratios make these countries vulnerable to a sovereign debt distress. Thus, we now can question whether debt intolerance is still merely a developing country feature any more. Developed countries with high debt-to-GDP ratios such as Japan and Belgium can be now candidates for a sovereign debt crisis. For example, by the end of 2010, Belgium's total external debt to GDP ratio is 96. And Japan's situation is worse. In 2012, OECD warned that Japan's gross public debt will reach 223 percent of the country's GDP in 2013.

- Therefore, developed countries with high external debt to GDP ratios such as Belgium and Japan should stop ignoring this fact because of their immunity for high external to GDP in the past. For this kind of countries a strong attempt to reduce their external debt to GDP ratios is a must from now on, to prevent a sovereign debt distress. In this context, it is very meaningful that Japan suffered a rating cut from Fitch Ratings for its foreign-currency grade by two leves to A+ on May 22, 2012, while OECD warned that the nation's debt was heading into ''uncharted territory''.

- The first of all policy recommendations for policy makers is to manage current account properly as the coefficient of current account balance to GDP is always negative in the base model for all sub-groupings.
- The total external debt to GDP ratio should be managed so that it will not exceed a certain threshold level as this ratio is found to be important determinant that affects sovereign debt distress positively in both developed and emerging countries.
- Higher U.S. treasury bills rates, according to our results, are only problems for developed countries but not for emerging countries and for European countries with sovereign default risk. The main concluding remark should be that European debt crisis is independent from global liquidity conditions. Yet, a probable higher U.S. treasury bills rate that could be triggered by a higher future global inflation might be very harmful for developed countries.
- For emerging countries and the European countries with default risk, the coefficient has a negative sign but this also points the fact that lower U.S. treasury bills rates coincide with low or recessionary growth for which these groups of countries are more vulnerable.
- It is not surprising that U.S. treasury bills, in the whole sample and in developing countries, are found to have positive effect on sovereign debt default as borrowing from international markets is expected to be much harder when global liquidity is low (U.S. treasury bills rate is one of the major indicators of global liquidity). This fact can also support the thinking that FED's long-term government bond purchases (with its popular name ''quantitative easing''s) have a cooling effect for sovereign debt distress in our sample countries.

- The empirical finding that the higher U.S. treasury bills the higher the risk of default in the developed countries allows to think that in the case of a severe debt distress in the developed countries, FED should respond by a monetary expansion (in the form of a long-term government bonds purchases) to cool the situation. Slashing policy rates is not an option at the moment, as the rates are near zero. Thus, it can be argued that the widely expected so-called QE3 (3rd round of quantitative easing) that is expected to be announced in Fall 2012 is also a useful tool to reduce the risk of a sovereign debt crisis in developed countries.

REFERENCES

Ades, A., Kaune, F., Leme, P., Masih, R., and Tenengauzer, D. (2000). Introducing GS-ESS: A new framework for assessing fair value in emerging markets hard-currency debt". *Global Economic Paper,* 45. New York: Goldman Sachs.

Alfonso, A., and Gomes P. (2010). Do fiscal imbalances deteriorate sovereign debt ratings?.

Arellano, C. (2008). Default risk and income fluctuations in emerging economies. *American Economic Review*, 98(3), 690-712.

Arora, V., and Cerisola M. (2001). How does U.S. monetary policy influence sovereign spreads in emerging markets*? IMF Working Paper.* International Monetary Fund.

Andritzky, J., Bannister G. J., and Tamirisa N. T. (2005). The impact of macroeconomic announcements on emerging market bonds. *IMF Working Paper,* 83. International Monetary Fund.

Andritzky, J. (2006). *Sovereign default risk valuation: Lecture notes in economic and mathematical systems 582.* Berlin Heidelberg: Springer.

Arezki, R., Candelon, B., and Sy A. N. R. (2011). Sovereign rating news and financial markets spillovers: evidence from the European Debt Crisis. *IMF Working Paper,* 11/68.

Arghyrou, M. G., and Alexandros K. (2010). The EMU sovereign-debt crisis: Fundamentals, expectations and contagion. *Seminar at the Hellenic Observatory, The European Institute, LSE, 12 October 2010*.

Baig, T., and Goldfajn I. (2000). The Russian default and the contagion to Brazil.

Baldacci, E., and Kumar M. S. (2010). Fiscal deficits, public debt, and sovereign bond yields. *IMF Working Paper,* 10/184.

Baldacci, E., Gupta, S., and Amine M. (2011). Political and fiscal risk determinants of sovereign spreads in emerging markets. *Review of Development Economics,* 15 (2), 251-263.

Balzli, B. (2010, August 2). *Greek debt crisis: How Goldman Sachs helped Greece to mask its true debt.* Retrieved from http://www.spiegel.de/international/europe/0,1518,druck- 676634,00.html, Spiegel Online.

Barro, R. J. (2001). Economic growth in East Asia before and after the Financial Crises. *National Bureau of Economic Research Working Paper,* 8330.

Bellas, D., Papaioannou M. G., and Petrova I. Determinants of emerging market sovereign bond spreads: Will this time be different. The World Bank.

Block, S. A., Burkhard N. S., and Vaaler P. M. (2003). Democratization's risk premium: Partisan and opportunistic political business cycle effects on sovereign ratings in developing countries, *Working Paper, University of Michigan.*

Bissoondoyal-Bheenick, E. (2005). An analysis of the determinants of sovereign ratings. *Global Financial Journal,* 15, 251-280.

Calvo, G. A. (1988). Servicing the public debt: the role of expectations. *The American Economic Review.*

Calvo, G. A. (1998). Understanding the Russian Virus: With special reference to Latin America. Retrieved from www.bsos.umd.edu/econ/ciecalvo.htm/

Calvo, G. A., Leiderman L., and Reinhart C. M. (1993). Capital inflows and real exchange rate appreciation in Latin America: The role of external factors. *IMF Staff Papers, 40(1), 108-151.*

Cantor, R., and Packer F. (1996). Determinants and impact of sovereign credit ratings. *Economic Policy Review,* 2(2).

Cuadra, G., Sanchez, J. M., and Sapriza H. (2010). Fiscal policy and default risk in emerging markets. *Review of Economic Dynamics,* 13, 452-469.

Darvas, Z., Pisani-Ferry, J., and Sapir A. (2011). A comprehensive approach to the Euro-Area debt crisis. *Bruegel Policy Brief, 2011/02.*

Dell'Ariccia, G., Schnabel, I., and Zettelmeyer J. (2002). Moral hazard and international crisis lending: A test. *IMF Working Paper.* International Monetary Fund.

Detragiache, E. (1996). Rational liquidity crises in the sovereign debt market: In search of a theory. *IMF Staff Papers,* 43(3).

Detragiache, E., and Spilimbergo, A. (2001). Short-Term debt and crises. International Monetary Fund.

Diamond, D. W., and Rajan R. G. (2000). Banks, short-term debt and financial crises: Theory, policy and applications. *NBER Working Paper,* 7764. National Bureau of Economic Research, Cambridge, Massachusetts.

Eichengreen, B., and Mody A. (1998). What explains changing spreads on emerging-market debt: Fundamentals or market sentiment?. *NBER Working Paper,* 6408. National Bureau of Economic Research, Cambridge, Massachusetts.

Eichengreen, B., Hausman, R., and Panizza U. (2003). Currency mismatches, debt intolerance and original sin: Why they are not the same and why it matters. *NBER Working Paper,* 10036. National Bureau of Economic Research, Cambridge, Massachusetts.

Feldstein, M. (2002). Economic and financial crises in emerging market economies: overview of prevention and management. *NBER Working Paper,* 8837.

Ferrucci, G. (2003). Empirical determinants of emerging market economies' sovereign bond spreads. *Bank of England Working Paper,* 205. Bank of England.

Gande, A., and Parsley D. C. (2005). News spillovers in the sovereign debt market. *Journal of Financial and Quantitative Analysis,* 12, 541-552.

Goldstein, M., Graciela L. K. and Reinhart C. M. (2000). Assessing financial vulnerability: An early warning system for financial markets. Institute for International Economics.

Gourinchas, P. O., and Obstfeld M. (2011). Stories of the twentieth century for the twenty-first. *American Economic Journal.*

Grahl, J. (2012). Politics and the euro crisis. *Middlesex University Business School Discussion Paper,* 147. March 2012.

Grammatikos, T., and Vermeulen, R. (2012). Transmission of the financial and sovereign debt crises to the EMU: Stock prices, CDS spreads and exchange rates. *Journal of International Money and Finance,* 31, 517-533.

Group of Ten. (1996). The Resolution of Sovereign Debt Crisis. Washington, DC.

Gros, D. (2010). Adjustment difficulties in the GIPSY club. *CEPS Centre for European Policy Studies Document,* 326. March 2010.

Guidotti, P., and Kumar, M. (1991). Domestic public debt of the externally indebted countries*". IMF Occasional Paper,* 80. IMF (June).

Gulati, M., and Zettelmeyer, J. (2012). Making a voluntary Greek Debt Exchange work.

Haque, N. U., Kumar, M., Mark, N., and Mathieson, D. (1996). The economic contents of indicators of developing country creditworthiness. *IMF Staff Papers,* 43(4), 688-724.

Hu Y. T., Kiesel R., Perraudin W. (2002). The estimation of transition matrices for sovereign credit ratings. *Journal of Banking and Finance,* 26, 1383 – 1406.

Jeanneret, A. (2009). The dynamics of sovereign credit crisis.

Judge, G. G., Griffiths W. E., Hill, R. C., Lütkepohl, H. and Tsong-Chao L. (1985). *The Theory and Practice of Econometrics.* 2nd ed. New York: John Wiley and Sons.

Kamin, S. B., and von Kleist, K. (1999). The evolution and determinants of emerging market credit spreads in the 1990s. *Board of Governors of Federal Reserve System International Finance Discussion Paper,* 653.

Kaminsky, G., and Schmukler S. L. (2002). Emerging market instability: Do Sovereign ratings affect country risk and stock returns?. *World Bank Economic Review,* 16, 171-195.

Karagol, E. (2005). Modelling the determinants of the debt rescheduling in Turkey. In Saziye Gazioglu (Ed.), *Emerging markets in financial crisis: Capital flows, savings, debt and banking reform* (pp. 29-61).

Karakaş, Hisarcıklılar and Öztürk. (2010).

Kawai, M., and Pomerleano M. (2009). Containing a systemic crisis: Is there a playbook?.

Larrain, G., Helmut, R., and von Maltzan, J. (1997). Emerging market risk and sovereign credit ratings. *OECD Development Centre Working Paper,* 124.

Levey, D. (2001). Revised country ceiling policy -rating methodology. Moody's Investors Service, Global Credit Research Moody's.

Manasse, P., Roubini, N., and Schimmelphennig A. (2003). Predicting sovereign debt crises. *IMF Working Paper.* International Monetary Fund.

Manasse, P., and Roubini, N. (2005). ‘‘Rules of thumb’’ for sovereign debt crises. *IMF Working Paper.* International Monetary Fund.

Matsaganis, M. (2011). The welfare state and the crisis: the case of Greece. *Journal of European Social Policy.*

McNamara, G., and Vaaler, P. M. (2000). The influence of competitive positioning and rivalry on emerging market risk assessment. *Journal of International Business Studies,* 31, 337-347.

Min, H. G. (1998). Determinants of emerging market bond spread: Do economic fundamentals matter?. *Policy Research Working Paper,* 1899. The World Bank, Washington D.C.

Mishkin, F. S. (1999). Lessons from the Asian Crisis. *Journal of International Money and Finance,* 18, 709-723.

Mishkin, F. S. (2001). Financial policies and the prevention of financial crises in emerging market countries. *NBER Working Paper,* 8087. National Bureau of Economic Research.

Montiel, P. J. (2003). *Macroeconomics in Emerging Markets.* Cambridge University Press.

Moody’s. (2009). Sovereign default and recovery rates, 1983-2008. *Moody’s Global Credit Policy,* March 2009.

Norden, L., and Weber, M. (2004). Informational efficiency of credit default swaps and stock markets: The impact of credit rating announcements. *Journal of Banking and Finance,* 28, 2813-2843.

Olivares-Caminal, R. (2011). The EU architecture to avert a sovereign debt crisis. *OECD Journal: Financial Market Trend,* Volume 2011, Issue 2.

Ozturk, H., Gultekin-Karakas D., Hisarciklilar M. (2011). Sovereign risk ratings: Biased towards developed countries?. *Society for the Study of Emerging Markets - EuroConference 2010 Challenges and Opportunities in Emerging Markets July 16-18, 2010, Milas, Turkey*

Pesaran, M. H., and Smith, R. P. (1995). Estimating long-run relationships from dynamic heterogeneous panels. *Journal of Econometrics,* 68, 79-113.

Reinhart, C. M. (2002). Default, currency crises, and sovereign ratings. *NBER Working Paper,* 8738. National Bureau of Economic Research.

Reinhart, C. M., Rogoff, K. S. and Savastano M. A. (2003). Debt intolerance. *NBER Working Paper,* 9908. National Bureau of Economic Research.

Reinhart, C. M., and Rogoff, K. S. (2009). The aftermath of financial crises. *NBER Working Paper,* 14656. National Bureau of Economic Research.

Reinhart, C. M., and Rogoff K. S. (2010a). Growth in a time of debt. *NBER Working Paper*. National Bureau of Economic Research.

Reinhart, C. M., and Rogoff K. S. (2010b). From financial crash to debt crisis. *NBER Working Paper,* 15795. National Bureau of Economic Research.

Rodrik, D. (2005). The social costs of foreign exchange reserves.

Rowland, P., and Torres, J. L. (2004). Determinants of spread and creditworthiness for emerging market sovereign debt: A panel data study.

Sgherri, S., and Zoli, E. (2009). Euro Area sovereign risk during the crisis. *IMF Working Paper,* 09/222. IMF European Department.

Standard&Poor's. (2011). Special report on the U.S. rating downgrade and its global effects. *CreditWeek,* Volume 31. No 31. August 17, 2011.

Suarez, J. (2010). The Spanish crises: Background and policy challenges. *CEMFI Working Paper,* 1005.

Sy, A. N. R. (2002). Emerging market bond spreads and sovereign credit ratings: reconciling market views with economic fundamentals. *Emerging Markets Review*, 3, 380–408.

Sy, A. N. R. (2003). Rating the rating agencies: Anticipating currency crises or debt crises?''. *IMF Working Paper.* International Monetary Fund.

Wade, R. (2008). The first-world debt crisis of 2007-2010 in global perspective. challenge. 51(4), 23-54.

Whelan, K. (2011). Ireland's sovereign debt crises. *UCP Centre for Economic Research Working Paper,* 11/09.

Reuters (2012). S&P downgrades nine euro zone countries, http://www.reuters.com/article/2012/01/14/us-eurozone-sp-idUSTRE80C1BC20120114, 14.01.2012

Bloomberg (2012). Spain Cut By S&P For 2nd Time This Year On Banks, Economy, http://www.bloomberg.com/news/2012-04-26/spain-cut-by-s-p-for-2nd-time-this-year-on-banks-economy.html, 27.04.2012

Bloomberg (2012). Japan Rating Cut By Fitch On Leisurely Efforts To Tame Debt, http://www.bloomberg.com/news/2012-05-22/japan-rating-cut-by-fitch-on-leisurely-efforts-to-tame-debt.htm, 22.05.2012

CNBC (2011). Sovereign Debt: Cnbc Explains, http://www.cnbc.com/id/44771099/Sovereign_Debt_CNBC_Explains, 14.11.2011

CNBC (2012). Moody's Downgrades Italy by Two Notches,http://www.cnbc.com/id/48170245,12.07.2012

Reuters (2012). Timeline: Greece's Economic Crisis, http://www.reuters.com/article/2010/02/03/us-greece-economy-events-idUSTRE6124EL20100203