Hacettepe University Graduate School of Social Sciences

Department of Economics

Master of Arts in Economics Programme

ANALYSIS OF THE RELATIONSHIP BETWEEN SOVEREIGN CREDIT RATINGS AND CREDIT DEFAULT SWAPS: A COMPARATIVE STUDY FOR TURKEY AND SELECTED COUNTRIES

Fatih Bahadır HASPOLAT

Master Thesis

Ankara, 2019

ANALYSIS OF THE RELATIONSHIP BETWEEN SOVEREIGN CREDIT RATINGS AND CREDIT DEFAULT SWAPS: A COMPARATIVE STUDY FOR TURKEY AND SELECTED COUNTRIES

Fatih Bahadır HASPOLAT

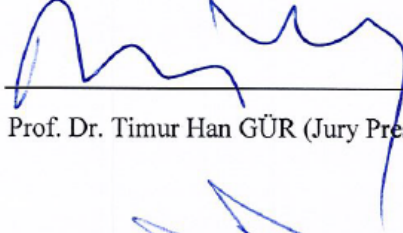Hacettepe University Graduate School of Social Sciences

Department of Economics
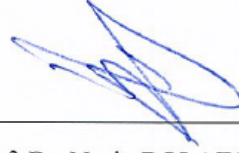
Master of Arts in Economics Programme

Master Thesis

Ankara, 2019

ACCEPTANCE AND APPROVAL

The jury finds that Fatih Bahadır HASPOLAT has on the date of 12 June 2019 successfully passed the defense examination and approves his Master's Thesis titled "Analysis of the Relationship Between Sovereign Credit Ratings and Credit Default Swaps: A Comparative Study for Turkey and Selected Countries".

Prof. Dr. Timur Han GÜR (Jury President)

Assoc. Prof. Dr. Nasip BOLATOĞLU (Main Adviser)

Assist. Prof. Dr. Mehmet ÇANAKCI

I agree that the signatures above belong to the faculty members listed.

Prof. Dr. Musa Yasar SAĞLAM

YAYIMLAMA VE FİKRİ MÜLKİYET HAKLARI BEYANI

Enstitü tarafından onaylanan lisansüstü tezimin/raporumun tamamını veya herhangi bir kısmını, basılı (kağıt) ve elektronik formatta arşivleme ve aşağıda verilen koşullarla kullanıma açma iznini Hacettepe Üniversitesine verdiğimi bildiririm. Bu izinle Üniversiteye verilen kullanım hakları dışındaki tüm fikri mülkiyet haklarım bende kalacak, tezimin tamamının ya da bir bölümünün gelecekteki çalışmalarda (makale, kitap, lisans ve patent vb.) kullanım hakları bana ait olacaktır.

Tezin kendi orijinal çalışmam olduğunu, başkalarının haklarını ihlal etmediğimi ve tezimin tek yetkili sahibi olduğumu beyan ve taahhüt ederim. Tezimde yer alan telif hakkı bulunan ve sahiplerinden yazılı izin alınarak kullanılması zorunlu metinlerin yazılı izin alınarak kullandığımı ve istenildiğinde suretlerini Üniversiteye teslim etmeyi taahhüt ederim.

Yükseköğretim Kurulu tarafından yayınlanan *"Lisansüstü Tezlerin Elektronik Ortamda Toplanması, Düzenlenmesi ve Erişime Açılmasına İlişkin Yönerge"* kapsamında tezim aşağıda belirtilen koşullar haricince YÖK Ulusal Tez Merkezi / H.Ü. Kütüphaneleri Açık Erişim Sisteminde erişime açılır.

- o Enstitü / Fakülte yönetim kurulu kararı ile tezimin erişime açılması mezuniyet tarihimden itibaren 2 yıl ertelenmiştir. [1]

- o Enstitü / Fakülte yönetim kurulunun gerekçeli kararı ile tezimin erişime açılması mezuniyet tarihimden itibaren ... ay ertelenmiştir. [2]

- o Tezimle ilgili gizlilik kararı verilmiştir. [3]

28/06/2019

Fatih Bahadır HASPOLAT

i

[1] *"Lisansüstü Tezlerin Elektronik Ortamda Toplanması, Düzenlenmesi ve Erişime Açılmasına İlişkin Yönerge"*

(1) *Madde 6. 1. Lisansüstü tezle ilgili patent başvurusu yapılması veya patent alma sürecinin devam etmesi durumunda, tez danışmanının önerisi ve enstitü anabilim dalının uygun görüşü üzerine enstitü veya fakülte yönetim kurulu iki yıl süre ile tezin erişime açılmasının ertelenmesine karar verebilir.*

(2) *Madde 6. 2. Yeni teknik, materyal ve metotların kullanıldığı, henüz makaleye dönüşmemiş veya patent gibi yöntemlerle korunmamış ve internetten paylaşılması durumunda 3. şahıslara veya kurumlara haksız kazanç imkanı oluşturabilecek bilgi ve bulguları içeren tezler hakkında tez danışmanının önerisi ve enstitü anabilim dalının uygun görüşü üzerine enstitü veya fakülte yönetim kurulunun gerekçeli kararı ile altı ayı aşmamak üzere tezin erişime açılması engellenebilir.*

(3) *Madde 7. 1. Ulusal çıkarları veya güvenliği ilgilendiren, emniyet, istihbarat, savunma ve güvenlik, sağlık vb. konulara ilişkin lisansüstü tezlerle ilgili gizlilik kararı, tezin yapıldığı kurum tarafından verilir *. Kurum ve kuruluşlarla yapılan işbirliği protokolü çerçevesinde hazırlanan lisansüstü tezlere ilişkin gizlilik kararı ise, ilgili kurum ve kuruluşun önerisi ile enstitü veya fakültenin uygun görüşü üzerine üniversite yönetim kurulu tarafından verilir. Gizlilik kararı verilen tezler Yükseköğretim Kuruluna bildirilir.*
Madde 7.2. Gizlilik kararı verilen tezler gizlilik süresince enstitü veya fakülte tarafından gizlilik kuralları çerçevesinde muhafaza edilir, gizlilik kararının kaldırılması halinde Tez Otomasyon Sistemine yüklenir

* *Tez danışmanının önerisi ve enstitü anabilim dalının uygun görüşü üzerine enstitü veya fakülte yönetim kurulu tarafından karar verilir.*

ETİK BEYAN

Bu çalışmadaki bütün bilgi ve belgeleri akademik kurallar çerçevesinde elde ettiğimi, görsel, işitsel ve yazılı tüm bilgi ve sonuçları bilimsel ahlak kurallarına uygun olarak sunduğumu, kullandığım verilerde herhangi bir tahrifat yapmadığımı, yararlandığım kaynaklara bilimsel normlara uygun olarak atıfta bulunduğumu, tezimin kaynak gösterilen durumlar dışında özgün olduğunu, **Doç. Dr. Nasip BOLATOĞLU** danışmanlığında tarafımdan üretildiğini ve Hacettepe Üniversitesi Sosyal Bilimler Enstitüsü Tez Yazım Yönergesine göre yazıldığını beyan ederim.

Fatih Bahadır HASPOLAT

ÖZET

HASPOLAT, Fatih Bahadır. *Ülke Kredi Notları ve Kredi Temerrüt Takasları Arasındaki İlişkinin İncelenmesi: Türkiye ve Seçilmiş Ülkeler Üzerine Karşılaştırmalı Bir Analiz*, Yüksek Lisans Tezi, Ankara, 2019.

21. yüzyılda artan finansal küreselleşme, sermaye akımlarını yönlendiren ülke kredi notlarını ve kredi temerrüt takaslarını (KTT) ülke ekonomilerinin ve küresel ekonominin en önemli aktörleri haline getirmiştir. Küresel finansal kriz ve sonrasında yaşanan Avrupa borç krizi ülke kredi notlarını ve KTT primlerinin belirleyicilerini anlamanın önemini göstermiştir. Bu kapsamda, bu çalışmada KTT'lerin ve ülke kredi notlarının hangi ekonomik ve sosyal değişkenlerden etkilendiği ve KTT primleri ile ülke kredi notunu açıklamanın mümkün olup olmadığı araştırılmıştır. Çalışmada, 2004-2007 yıllarını kapsayan 68 ülke verisi kullanılarak panel veri yöntemiyle analizler yapılmıştır. Çalışma sonucunda, kişi başına düşen reel milli gelir, siyasi istikrar ve mevzuat kalitesi değişkenlerinin ülke kredi notunu pozitif etkilediği ortaya çıkarken, genel devlet brüt borç stokunun GSYH'ye oranı, işsizlik ve temerrüt geçmişinin ülke kredi notları üzerinde negatif etkiye sahip olduğu belirlenmiştir. Bu değişkenlerin büyük bölümünün beklendiği şekilde KTT primlerini ters şekilde etkilediği sonucuna ulaşılmıştır. Ülke kredi notlarından farklı olarak, enflasyon ve döviz kuru oynaklığı değişkenlerinin KTT primleri üzerinde anlamlı etkiye sahip olduğu, diğer taraftan siyasi istikrar değişkeninin ise KTT primleri üzerinde belirgin etkiye sahip olmadığı sonucuna ulaşılmıştır. Son olarak ise, KTT primlerinin tek başına ülke kredi notlarını açıklama gücünün diğer makroekonomik ve siyasi değişkenlerle oluşturulan modellere yakın olduğu görülmüştür.

Anahtar Sözcükler

Kredi Riski, Ülke Kredi Notu, Kredi Derecelendirme Kuruluşları, Kredi Temerrüt Takasları, KTT Primleri, Panel Veri

ABSTRACT

HASPOLAT, Fatih Bahadır. *Analysis of the Relationship between Sovereign Credit Ratings and Credit Default Swaps: A Comparative Study for Turkey and Selected Countries*, Master's Thesis, Ankara, 2018.

Financial globalization in the 21th century has led the sovereign credit ratings and credit default swaps (CDS), which drive the global capital flows, to become the most important factors of the individual country economies, as well as global economy. The global financial crisis and European debt crisis afterwards have demonstrated the importance of understanding the determinants of sovereign credit ratings and CDS premiums. Within the scope of this study, it has been investigated whether the sovereign credit ratings and CDS premiums change according to the political and economic factors and CDS premiums can explain the sovereign credit ratings. Panel data method, with annual economic and political data of 68 countries for 2004-2017 period, is used for the study. It is found that real GDP per capita, political stability and regulatory quality positively affect sovereign credit ratings, while GDP share of general government gross debt, unemployment and default history have negative affect on sovereign credit ratings. These variables have mostly significant opposite effects on CDS premiums, as expected except for political stability. It is observed that inflation and exchange rate volatility also positively affect CDS premiums. Lastly, it is found that the power of CDS premiums to explain sovereign credit ratings alone is close to the explanatory power of other macroeconomic and political variables.

Key Words

TABLE OF CONTENTS

ABBREVIATIONS

CAB	Current Account Balance
CCR	Comprehensive Credit Rating
CDS	Credit Default Swap
CRA	Credit Rating Agency
ECB	The European Central Bank
EU	European Union
GMM	Generalized Method Of Moments
IMF	International Monetary Fund
ISDA	International Swap And Derivatives Association
NRSRO	Nationally Recognized Statistical Rating Organization
OLS	Ordinary Least Squares
S&P	Standard and Poor's
SCR	Sovereign Credit Rating
SEC	Securities and Exchange Commission
USD	United States Dollar
VIX	Volatility Index

TABLES

FIGURES

INTRODUCTION

The concept of credit risk, which has been existed from the middle of the 19th century, has become one of the most important factors in the world economy, especially with the globalization process accelerating in the last decades. Since second half of the 20th century, worldwide economic and financial integration has created new opportunities for investors. These opportunities can turn into big risks in case of the inability of the borrowers to fulfill their obligations.

Globalization and financial deepening brought the opportunity for economic agents to utilize their savings through investments in all over the world. However, it is not possible for the investors to have complete knowledge of whether each borrower can fulfill its obligations. In order to ensure the sustainability of the financial markets and the continuation of the trust environment, the capacity of the borrower institutions and countries to fulfill their obligations and the existing risks should be known by investors. This need created a separate business area and led to the establishment of credit rating agencies (CRA). CRAs have become the director of global capital with their role in international financial integration and globalization.

The CRAs evaluate the credit risks of the countries and public institutions, as well as corporate firms and financial institutions, that wish to borrow from the international markets. In the current financial system, institutions or states that wish to borrow from international markets demand from the CRAs to give them credit ratings and borrow from the markets according to their ratings. The credit ratings of the borrowers from the CRAs indicate the risk status that they can fulfill their debt obligations.

Credit ratings affect countries in many ways. Firstly, as the credit rating indicates the risk status of the countries, countries with low credit ratings have a higher risk perception and may borrow from international markets at higher rates than those with high credit ratings. The sovereign credit ratings indirectly affect not only public borrowing but also the private sector borrowing of countries and the attractiveness of

the private sector for foreign investors. For example; When Moody's lowered Japan's country credit rating in November 1998, it also lowered credit ratings for all other Japanese public and private bond issuers (Jüttner and McCarthy, 2000). Although the sovereign credit rating is related to public debt, it also affects private sector capital markets, especially in developing countries. In countries where not known much, investors match the sovereign credit ratings with private sector risk. Furthermore, considering the fact that CRAs evaluate only 25 percent of non-US companies in developing countries, the importance of the sovereign rating seems to be much higher (Setty and Dodd, 2003). However, they are exposed to many criticisms, such as the lack of transparency of the grading systems, the positive discrimination against some countries, their failure to foresee the crises and their deepening of the crises that they have not foreseen (Alexe et al., 2003; Balıkçıoğlu, 2013).

The sovereign credit ratings were accepted as the most used indicator to measure the credit risk of a country up to the global financial crisis in 2008. Criticisms that credit ratings are inadequate for predicting the crisis have increased the demand for different indicators that can quickly adapt to changing conditions for the country's credit risk measurement.

As an alternative indicator of credit risk, credit default swap (CDS), one of the most important credit derivatives in financial markets, has become one of the most widely used indicators in the measurement of credit risk of countries. Changes in CDS premiums have been carefully monitored by investors, policy makers, researchers and other professionals (Flippos, 2017).

The importance of CDS, which is first developed by JP Morgan Chase in 1995, is based on the 1990s. In order to hedge their credit risk, CDS has been intensively used in financial markets. As the number of traded reference assets increased, liquidity and diversity in the market increased. CDSs have advantages over other credit risk indicators which increase their preferability. The biggest advantage of CDS according to other indicators is that the premiums are arranged on a regular daily basis and reflect the current market conditions. Since the spreads are daily revised and reflect the supply-

demand for these CDS contracts, every new situation in the market is reflected very quickly in premiums.

Although there are some publications related o determinants of sovereign credit rating and CDSs, researches on this subject have increased with the increasing financial integration especially since the 2000s. The change in CDS premiums clearly reflects the developments in the credit costs of economic agents in a country, which is an important indicator of the performance of the real economy. Because there exists a strong interaction between the risk premiums and financing costs of all real and financial institutions operating in the country, it is highly important to correctly diagnose the underlying dynamics in CDS pricing and the factors that lead to changes in CDS premiums (Kilici, 2017). The IMF Global Financial Stability Report (2013) states that the country's credit risk had a much greater impact on global financial stability than financial and macroeconomic risks. It has emphasized the importance of accurately measuring the credit risk of a country and identifying the determinants due to the magnitude of the impact to the financial system.

In Turkey, there is no advanced literature on sovereign credit ratings and CDS premiums. Most of the existing literature does not contain econometric analyzes. In this context, this study, which is conducted using the data of 68 countries for 14 years, aims to determine the macroeconomic and political variables affecting the country risk trough sovereign credit ratings and CDS premiums. The main purpose of this study is to analytically identify the relationship between sovereign credit ratings and CDS premiums with econometric methods.

In this context, after the introduction, general features of credit rating and its historical development is presented in the first chapter. Also, information related to credit rating market and the global rating agencies are included in this chapter.

In the second chapter, criticisms towards rating agencies and the crises that CRAs had affected in many ways are explained in detail. In the context of alternative ways to measure credit risk, development of CDS market and its importance in financial markets are also retailed in this chapter.

In Chapter 3, factors affecting the sovereign credit ratings and CDS premiums are examined. Information is given about the criteria which S&P, Moody's and Fitch Ratings institutions take into account while determining sovereign credit ratings. The documents they publish about how these institutions determine their credit ratings are examined and explained in detail together. Then, literature about the determinants of sovereign credit ratings and CDS premiums and studies conducted on their relationship are given.

In the fourth chapter, the data set which is formed by taking into account both the literature and CRAs' rating methodologies and the analysis methodology is explained. In the conclusion section, there exists a general review of CDS premiums and the sovereign credit ratings and findings of the model results are argued.

CHAPTER 1

BASIC APPROACHES TO CREDIT RATING AGENCIES, SOVEREIGN CREDIT RATINGS AND CREDIT DEFAULT SWAPS

1.1. GENERAL FEATURES OF CREDIT RATINGS

According to dictionary definition, rating is a measure of quality, standard or performance of someone or something by comparison. Rating is also defined as the ranking of the reliability of companies by the commercial risk of assets and the political risks of countries.

Yazıcı (2009) defines the concept of rating as a standard and objective opinion created by professionals who assess debtors' regular payback capacity and influence the role of money and capital markets accordingly. Karaöz (1990) evaluates the concept of rating as follows: "*it is a study of the measurement of a risk of an investment in securities issued by a debtor, in order to provide an objective measure of the possibility of timely and complete repayment of the credits to be issued*".

According to Yanar (2002), rating is a tool that makes life easier for investors by providing information to markets with simple symbols that is obtained as a result of costly and time-consuming work. The rating, which is an important expression of the debt servicing power and financial structure of the borrowing side, is an easy-to-understand, systematic and useful symbol helping economic actors in the capital markets such as business people, investors and intermediaries (Halıcı, 2005).

The rating determines the quality of a loan, an institution or a security, and does not advise on the purchase and sale of a security (Körs, 2011). Rating helps to reveal the current situation of companies and economies as a result of examining the past. It is useful to consider rating this direction only as a performance analysis rather than a forecast for the future.

In Article 5 of Communiqué Serial: VIII, No: 40 "Principles Regarding Capital Market Rating and Rating Agencies" published by Capital Markets Board in 2007; Credit Rating is defined as "*objective and fair evaluation and classification of borrowers by rating institutions in terms of the risks and ability to pay the liabilities such as principal, interest and similar obligations in time*".

On the other hand, the notion of sovereign credit rating has different definitions in economics and finance literature. John Moody, one of the inventors of the notion of credit rating, classified the country credit rating as the relative creditworthiness of the government and classified it as the payment ability and payment intention (goodwill) of countries, in the book entitled "Moody's Manual and Investment Letters" published in 1918 (Bheenick, 2005: 252).

In the case of Fitch Ratings, the country credit rating is taken as a frontward evaluation of the ability and eagerness of countries to fulfill their current and future obligations. Cantor and Packer (1996) define the sovereign credit rating as an indication of the ability of the borrower's to meet its obligations on time. Ben-Ami (1991) defines the sovereign credit rating as the measure of the borrowing capacity of the countries. Reinhart (2002) expresses sovereign credit rating as a statistical summary of the default probability of a country.

Credit ratings are widely used by banks, financial institutions, large-scale businesses, local governments and governments seeking to export national or international securities. In Turkey, the credit rating is widely used for bonds of government, banks and large-scale companies.

The rating determines the quality of a loan, an institution or a security, and does not advise on the purchase and sale of a security (Körs, 2011). Rating helps to reveal the current situation of companies and economies as a result of examining the past. It is useful to consider rating this direction only as a performance analysis rather than a forecast for the future.

Since the cost of the loan rises in direct proportion to the risk, the lenders demand a credit rating from the borrowers in order to calculate the risks to be undertaken. As the risk increases, the cost of the loan will increase and they try to protect themselves in a sense. Because the credit risk is not the same for credit given to borrowers with high creditworthiness compared to borrowers with low creditworthiness (Apaydın et al., 1990). In this context, financially strong and the internationally recognized companies or countries have the advantage of having easy loans because of the high creditworthiness. In addition, creditworthiness affects the amount of the loan to be awarded as well as the conditions for granting the loan such as maturity and interest rates (Halıcı, 2005: 15). From this point of view, the country or organization with high creditworthiness pays less interest than the country or organization with low creditworthiness.

In the meantime, the notion of sovereign credit rating has different definitions in economics and finance literature. John Moody, one of the inventors of the notion of credit rating, classified the country credit rating as the relative creditworthiness of the government and classified it as the payment ability and payment intention (goodwill) of countries, in the book entitled "Moody's Manual and Investment Letters" published in 1918 (Bheenick, 2005: 252).

Ben-Ami (1991: 4) defines the sovereign credit rating as the measure of the borrowing capacity of the countries. Reinhart (2002) expresses sovereign credit rating as a statistical summary of the default probability of a country.

Credit ratings are widely used by banks, financial institutions, large-scale businesses, local governments and governments seeking to export national or international securities. In Turkey, the credit rating is widely used for bonds of government, banks and large-scale companies.

1.2. HISTORICAL DEVELOPMENT OF RATING CONCEPT AND CREDIT RATING AGENCIES

The first study in the field of rating dates back to about two centuries ago. From 1830s to the present day, the concept of rating has become more and more important with the deepening and globalization of the financial markets. Information on the development of this concept in the world and legal arrangements will be addressed under this chapter.

1.2.1. Historical Development of Credit Rating

On the contrary to expectations, the concept of rating was born as a result of requests from the real sector, not from the financial sector. Following the massive collapse of the US economy in 1837, firms were unable to fulfill their financial responsibilities (Şirvan, 2004). Lewis Tappan, a New Yorker dealer who was also affected by this crisis, tried to determine the financial situations of its customers. These evaluations, which he had done for him first, were turned into a new business by demand from other businessmen, and in 1841 he established the Mercantile Agency, the first company operating in this area. This organization, which was later maintained by Robert Dun, prepared the first manual for credit rating in 1859 (Ettinger and Golieb, 1962). The company conducted its activities by informing its members only during certain periods without using rating symbols. The company spread its activities throughout the United States with the name of "R.G. Dun and Company". The number of customers including wholesalers, importers, manufacturers, banks and insurance companies reached to 40 thousands from 7 thousand in ten years in the 1870s and exceeded one million in the early 20th century (Sylla, 2002).

The second person to approach the rating activity professionally after Tappan was John Bradstreet who was a lawyer. Recognizing the firms that have suffered difficulties in fulfilling their obligations through his lawyer duty, Bradstreet established Bradstreet Company in New York in 1849 (Ettinger and Golieb, 1962). This company, which measured the ability of merchants to fulfill their commitments and gathered information about merchants and published the first commercial rating guide in 1857, merged with Dun and Company and became Dun & Bradstreet Company. In 1962, this company took the name of John Moody's rating company, Moody's Investors Service, which started operating in 1909 (Syyla, 2002).

The emergence of a credit rating as a concept was the result of the work of John Moody in the United States at the beginning of the 1900's. In the 19th century, large-scale companies were formed due to the fact that the private sector was tendered in the course of railway construction in the United States. With the increasing investments in the railway sector, speculation has come to fruition due to competition as well as earnings, and risk factors for investments have begun to emerge. John Moody established Moody's Investors Service, the first rating agency in 1905, to publish the first ratings in the book 'Analysis of Railway Investments' in 1909 (Kılıç, 1989: 28). Moody also used the lettering system for the first time in its handbook titled "Moody's Manual of Industrial and Corporation Securities".

Establishing after Moody's Investor Services, Poor's Publishing Company made its first credit rating in 1916. Standard Statistics Company and Fitch Publishing Company published their first ratings in 1922 and 1924, respectively. Later, the number of credit rating agencies in the United States decreased to three because of the merger of "Standard Statistics Company" and "Poor's Publishing Company" in 1941 and becoming "Standard and Poor's (S&P)" (Canton and Packer, 1994).

The Standard Statistics Company had been working in the field of rating since 1923 and continued to operate as an independent company until 1966, when S&P was incorporated into McGraw-Hill, a large publishing company under the name Standard & Poor's, (S&P, 2013). In the 1930s, the Standard Statistics Company expanded its rating

portfolio by rating the securities issued by the governments. This expansion then continued with the rating activities of insurance companies, mortgage-backed securities, mutual funds, and asset-backed securities (S&P, 1988). By this way, it became the pioneer in the rating sector and expanded the sector's working areas.

Fitch Ratings was founded by John Knowles Fitch in 1913 under the name "Fitch Publishing Company" and has grown rapidly. Two books prepared for investors attracted great interest in the US and spread the recognition of Fitch Ratings to other countries. Fitch Ratings has added a new dimension to the credit rating area by offering a wide range of scales from AAA to D by lettering of credit ratings.

Moody's, the oldest rating agency, was acquired by Dun & Bradstreet in 1962, and in 2000 became a separate company but semi-affiliated to Dun & Bradstreet (Çelik, 2004). In 1997, Fitch Ratings merged with a British firm, IBCA, which was later acquired by FIMALAC in central Paris. Another rating agency, Duff & Phelps, began to examine the public service companies in 1932 and expanded its business from 1982 by starting to rate company bonds. This company joined Fitch Ratings in 2001 (Setty and Dodd, 2003).

Moody's was the first institution to evaluate government bonds. Ten years after the valuation of railway investments in 1909, Moody's made the valuation of government bonds which federal states issued. Although these states have been issuing bonds for decades, studies for their credit rating developed too late. As a matter of fact, the S&P began valuing government bonds after 1950s (Hempel, 1971).

In the United States, the state and local government bond market began to emerge in the late 18th century and developed rapidly. The total size of the government bond market, which was dollars 13 million in 1825, reached 260 million $ in 1843. This value approximated 1.1 billion $ in 1880 and 2 billion dollars in early 1900's (Sylla, 2002).

Although state bonds were first rated in 1919, they had defaulted many times since 1839. Between 1839 and 1943, a total of 125 million dollars in debt was denied by 12 states and 13.8 million dollars was denied and no interest of 1.3 million dollars was paid for this amount. Between 1873 and 1879, the second default event broke out, the quarter of the total amount of bonds totaling approximately 1 billion dollars defaulted and no principal and interest payments of 150 million dollars were made. Between 1893 and 1899, a smaller amount of debt ($ 130 million) than the previous one had defaulted and a $ 25 million loss occurred. During the great depression, US financial markets encountered with the greatest default of its history, with $ 2.85 billion, which corresponds to 15 percent of market size (Sylla, 2002).

Along with macroeconomic stability resulting from the end of the world wars, the rate of default in the US has decreased greatly and credit ratings of state and local government accounts have been increased by credit rating agencies (Sylla, 2002). Along with the rapid wealth increase in the post II. World War era, the increase in household incomes was also reflected in the savings. This has contributed significantly to the number of potential investors and to the availability of funds ready to be used at the market.

On the other hand, new companies and governments have begun to issue bonds to take advantage of existing savings, and the national and international financial markets have gradually expanded. In 1971, with the collapse of the Bretton Woods system and the shift of the gold standard to floating exchange rate regime accelerated the internationalization of financial flows. This volume growth in the financial markets and the emergence of new bond issuers have also been an opportunity for CRAs who have not grown up much since the 1970s (Sylla, 2002). Until the 1970s, the expansion of the financial markets was mostly confined to the US, bond supply and demand intensified in there. The fact that the US is financially developed and the economy is strong and stable especially during this period, has made US state and private sector bonds very low risk for investors. On the other side of the world, the limited volume of financial markets has been a major barrier for growth for CRAs (Gaillard, 2012).

In the post-World War II period, the formation of the Eurodollar market and the OPEC cartel reshaped the capital distribution that emerged after the World War I and led to the expansion of the investor class all over the world (Sylla, 2002). This situation caused the financial markets to grow significantly in both volume and geographical terms since 1970s. With this growth, the rapidly increasing number of CRAs has required selectivity and some legal arrangements for governments and firms. The first legal arrangements for the activities of rating agencies were made by the Securities and Exchange Commission (SEC) in the United States, where these activities take place first. In order to regulate the activities of the rating agencies and their entry into the market, the SEC has named the nationally recognized rating institutions as Nationally Recognized Statistical Rating Organizations (NRSRO) from 1975 onwards (TCMB, 2010).

The relatively developed financial systems in the United States and Europe have spread rapidly to the rest of the world. The integration of the European and Asian economies, which are relatively less stable than the US markets, into the financial system has been a great opportunity for CRAs. In line with the growing bond issuance market, from the 1970s to the 21st century, the CRAs have made significant progress in terms of business volume and global impact. The famous journalist and economist Thomas Friedman, in a television interview with David Gergen in 1996 states that there are two great superpowers on the earth; US and Moody's. He expresses the enormous power of CRAs by stating that he does not know whether US bombs or Moody's rating cuts are more dangerous for a country (Gergen, 1996).

1.2.2. Global Credit Rating Agencies

As of November 2017, there are 76 CRAs operating in different countries and regions (Annex 1). According to the Credit Rating Agency Reform (Act of 2006), which was issued in 2006 in the US to ensure the maintenance of investors' protection and credit rating activities in a competitive environment and within the framework of transparency, accountability, there are ten CRAs with the status of "nationally recognized statistical rating organization (NRSRO)". These organizations;

i) Financial institutions and stock exchange companies,

ii) Insurance companies,

iii) Corporate bonds,

iv) The issuers of asset-backed securities,

v) State, municipality and SEE bonds,

vi) Any combination of above categories (Table 1).

Table 1: NRSROs and Their Rating Fields

Credit Rating Agency	Registration Date	Rating Field	Origin
1) A.M. Best Company(A.M. Best), Inc.	24 Sep 2007	ii, iii, iv	USA
2) Dominion Bond Rating Service (DBRS)Ltd.	24 Sep 2007	i, ii, iii, iv, v	USA
3) Egan-Jones Ratings Company (EJR)	21 Dec 2007	i, ii, iii	USA
4) Fitch Ratings (Fitch) Inc.	24 Sep 2007	i, ii, iii, iv, v	USA
5) HR Ratings de México, S.A. (HR Ratings)	5 Nov 2012	i, iii, v	Mexico
6) Japan Credit Rating Agency (JCR) Ltd.	24 Sep 2007	i, ii, iii, v	Japan
7) Kroll Bond Rating Agency(KBRA) Inc.	11 Feb 2008	i, ii, iii, iv, v	USA
8) Moody's Investor Service (Moody's) Inc.	24 Sep 2007	i, ii, iii, iv, v	USA
9) Morningstar Credit Ratings (Morningstar), LLC.	23 June 2008	İ, iii, iv	USA
10) Standard & Poor's Ratings Services (S&P)	24 Sep 2007	i, ii, iii, iv, v	USA

Source: SEC, 2017

Table 2: Number of Outstanding Credit Ratings as of by Rating Category

NRSRO	Financial Institutions	Insurance Companies	Corporate Issuers	Asset-Backed Securities	Government Securities	Total Ratings
A.M. Best	N/R	7,537	1,359	18	N/R	8,914
DBRS	7,969	158	3,037	12,757	16,784	40,705
EJR	11,112	837	6,480	N/R	N/R	18,429
Fitch	44,965	3,188	17,848	39,981	197,543	303,525
HR Ratings	547	N/R	140	N/R	352	1,039
JCR	787	65	2,356	N/R	486	3,694
KBRA	705	5	1	5,561	63	6,335
Moody's	49,472	3,230	44,676	64,188	619,478	781,044
Morningstar	35	N/R	308	3,591	N/R	3,934
S&P	58,582	6,859	50,672	49,162	952,910	1,118,185
Total	**174,174**	**21,879**	**126,877**	**175,258**	**1,787,616**	**2,285,804**

Source: SEC, 2017

Note: N/R means that the firms were not registered as NRSRO in the mentioned rating category.

In Table 2, the research carried out by the SEC shows the activities of the CRAs in financial markets. According to this, these organizations which have NRSRO status carried out the ranking of approximately 2.3 million bonds in 2016. Approximately 78 percent of the rating activities are composed of state, municipal and SEE bonds. 97 percent of the rating activities are conducted by S&P, Moody's and Fitch Ratings, which are three major credit rating agencies (Figure 1).
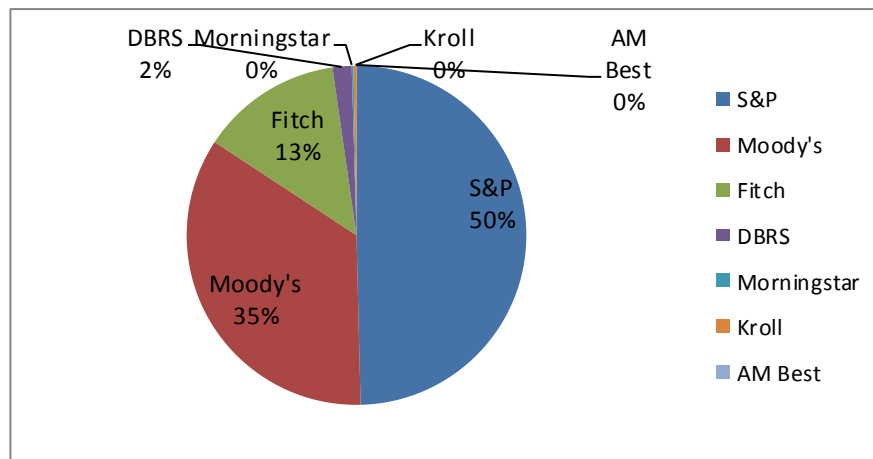
Figure 1: The market share of CRAs

Source: SEC, 2017

As seen in Chart 1.1, there are many institutions operating in the credit rating sector, but Moody Moods, S&P and Fitch Ratings are the dominant institutions. Below is information on the history and structure of these three organizations.

1.2.2.1. Standard & Poor's

The first structure of S&P was created in 1860 by Henry Varnum Poor. Him and his son founded the "H.V. & H.W. Poor Co" Company and published their analysis of the operational and financial situation of the American railway industry, and took the first commercial steps into the financial information market by selling 2500 of them for 5 dollars per one (S&P, 2014a).

In 1906, Luther Lee Blake established the Standard Statistics Office to eliminate the lack of knowledge in financial markets such as Henry Varnum Poor. By 1914, it had

become a company with 70 employees and continued its activities under the name of Standard Statistics Inc. In 1941, two companies merged and took the name of Standard & Poor Corp. The company has continued its operations and financial information activities under this roof of Mc. Graw Hill Company after 1966 ("Our History", 2018).

S&P started to serve its investors in Europe in London in 1984 and. Nowadays, S&P hires approximately 1500 analysts and more than 20,000 employees in 28 countries, and rates the bonds issued by financial institutions, insurance companies, companies and governments. S&P, which had a credit rating volume of 46,3 trillion dollars by 2017, signed an new credit rating agreement of $ 3.7 trillion in 2016 alone (S&P, 2018).

The definitions of S&P's credit ratings are given in Table 3. S&P defines the notes above BBB as "investment grades" and the notes BB and under as "speculative grades". D grade is expressed as a note given to the countries in default. The main categories are subcategorized as "+" and "-". These (+) or (-) signs show the relative position within the rating categories which also states the possibility of up or downgrading.

Table 3: S&P Credit Rating Definitions

Category	Definition
AAA	The obligor has extremely strong capacity to fulfill its financial commitments.
AA	The obligor has very strong capacity to fulfill its financial commitments.
A	The obligor has still strong capacity to fulfill its financial commitments, however it may somewhat be effected from economic conditions and change in circumstances.
BBB	Economic conditions and change in circumstances may more likely effect the obligor's its financial commitments.
BB	Although the Obligor exhibits adequate protection parameters, it may have inadequate capacity because adverse economic conditions to meet its financial commitments
B	Obligor has the capacity to meet its financial commitments but it is more vulnerable adverse economic and financial conditions.
CCC	Obligor has not the capacity to meet its financial commitments in adverse economic and financial conditions.
CC	Obligor has very low capacity to meet its financial commitments in current situation.
C	Obligor has very low capacity in current situation and lower possibility of economic recovery to meet its financial commitments.
D	The obligor is in default and cannot make payments on the date due.

Source; https://www.standardandpoors.com

The distribution of the credit ratings of S&P given to countries by 2012 is shown in Figure 2. Accordingly, North America and Europe are generally the regions with the highest ratings, while the countries with the lowest ratings are concentrated in the African Continent. Turkey has a speculative investment grade classes which is shown in orange on this map. As of November 2018, S&P notes Turkey, fragility least in the short term, but below the level of investment can be made with a B+ implying uncertainty in financial matters levels.
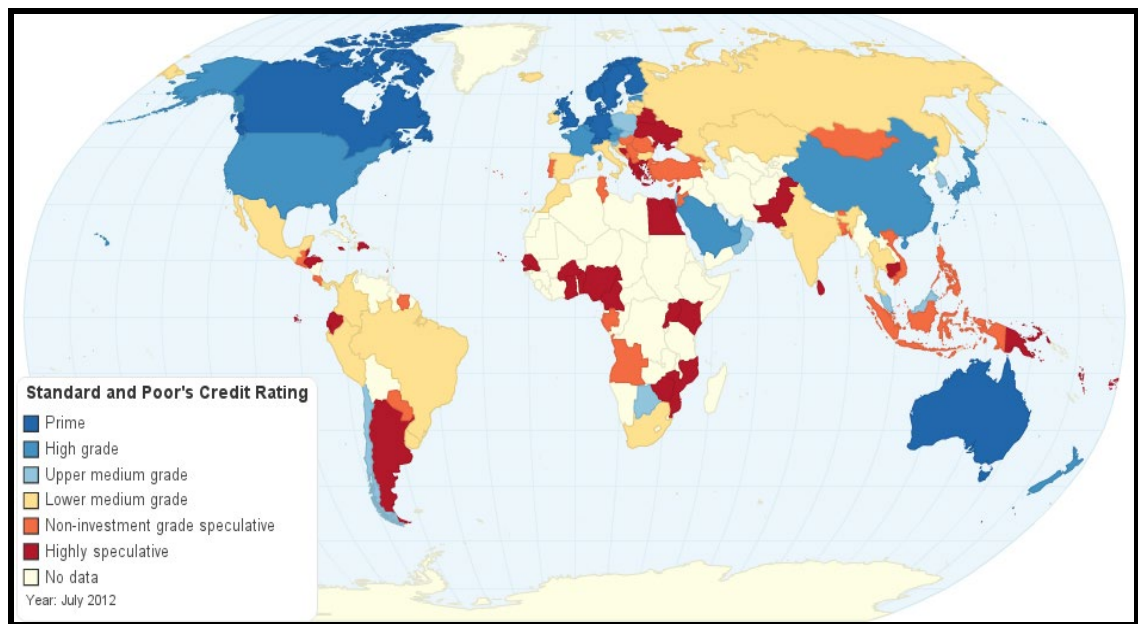
Figure 2: Regional Distribution of S&P Sovereign Rating

Source: Chartssbin.com

1.2.2.2. Moody's

Moody's is the second biggest firm in the credit rating field in terms of market dominance after S&P. The company was founded in 1900 by John Moody under the name of Industrial John Moody & Company. The company started its activities by publishing "Moody's Manual of Industrial and Miscellaneous Securities" which gives information and statistics about financial institutions and governments as well as securities and bonds of mining, food and manufacturing companies. The published book has received great interest and spread to the US as Moody's Manual. In 1909 Moody published a new book to analyze bonds of US railways ("Moody's History", 2018).

John Moody was the first person in the field of financial information services, by analyzing the operations, management, and finance of railway companies of the property alone. In addition, Moody was the first to make letters for commercial companies and the rating method for government bonds. In his book, written in 1909, Moody has published the book Analysis of Railroad Investments, which describes the operations, management and financing of railway companies for investors. When this published book attracted a great deal of interest from investors, Moody prepared a similar work in 1913 for industrial companies and stocks.

In a short time, Moody's ratings have become an important factor in the bond market. In 1914, Moody's company became a joint-stock company under the name of Moody's Investors Service. Approximately ten years later, the entire US bond market was rated by Moody's. The meaning of the letter notes given by Moody's to loans is shown in Table 1.4. Moody defines "Baa" and upper notes as "investment grades" and defines the "Ba" and below notes as "speculative grades".

Table 4: Moody's Credit Rating Definitions

Grade	Definition
Aaa	Obligor has the highest financial quality and has the lowest credit risk level.
Aa	Obligor has high financial quality and has very low credit risk level.
A	Obligor has upper medium financial quality and has low credit risk level.
Baa	Obligor has medium financial quality and has moderate credit risk level which may have some speculative characteristics.
Ba	Obligor is judged to be speculative and has some considerable credit risk.
B	Obligor is speculative and has high credit risk.
Caa	Obligor is judged to be very speculative and has very high credit risk.
Ca	Obligor is highly speculative and very near to default.
C	Obligor is typically in default and has not much tool for recovery.
WR	Default

Source: Moody's, 2018

Note: Moody's uses 1, 2, and 3 as numerical modifiers for sub classification

Moody's has further expanded its ratings over time, and has started rating activities in many areas, from commercial enterprises to bank deposits. Today, Moody's operates in 42 countries with approximately 12,600 employees.

1.2.2.3. Fitch Ratings

Fitch Ratings was founded in 1913 by John Knowles Fitch under the name of "Fitch Publishing Company", in New York. At first, the company published "The Fitch Stock and Bond Manual" and "The Fitch Bond Book" and provided investors with financial statistics. In 1924, the company added a new dimension to the rating field and extended its credit ratings from AAA to D. This type of rating then inspired other organizations and was generally accepted in the markets. Fitch Ratings, which started business with bank evaluation, expanded the field of work and operated in other sectors as other CRAs. In 1975, it became one of the three companies with NRSRO status.

Table 5: Fitch Ratings Credit Rating Definitions

Category	Definition
AAA	It represents the highest capacity to meet financial obligations and the lowest default risk. It is unlikely that this capacity will be affected by predictable negativities.
AA	It represents a very high capacity to fulfill financial obligations and a very low default risk. This capacity is considerably resistant to predictable negativities.
A	It represents high capacity to meet financial obligations and low default risk. This capacity may be more affected by business cycles and economic conditions than other high ratings.
BBB	It represents the low default risk and high capacity to fulfill its financial obligations. However, this capacity is likely to be affected by economic conditions.
BB	It represents high sensitivity against the risk of default in case of negative economic conditions.
B	It represents the default risk in the current situation. Although it fulfills its financial obligations, it has the possibility of default for the following periods.
CCC	It represents high probability of default.
CC	It represents the significance of default.
C	It represents the situation that the default is inevitable.
D	It represents the current default position.

Source: Fitch Ratings, 2014

Fitch Ratings merged with IBCA, a London-based subsidiary of FIMALAC, in 1998, with the aim of becoming a global company, and continued its operations under FIMALAC as Fitch-IBCA. As a result of the merger, it gained an important position both in Europe and the USA, and after Moody and S&P, it had the effect of directing the markets and became the world's third largest credit rating agency. Fitch, which continues its growth efforts, has incorporated its competitors Thomson Bank Watch and Duff & Phelps Credit Ratings Co. In 2008, the company established Fitch Solutions and Fitch Training subsidiaries, working in financial risk management and financial market education in financial markets. Today, Fitch Ratings operates in 30 countries with approximately 2000 staff. The lettering method for Fitch's Ratings is given in Table 5.

1.2.2.4. Outlook of Rating

S&P, Moody's, and Fitch Ratings describe the "outlook of the rating" to give an indication of the future situation in addition to the letter grades they use. While the "positive outlook" reflects the probability of an increase in the following period, negative outlook" indicates the possibility of a decrease in the following period and, stable outlook means that no change in the note is expected.
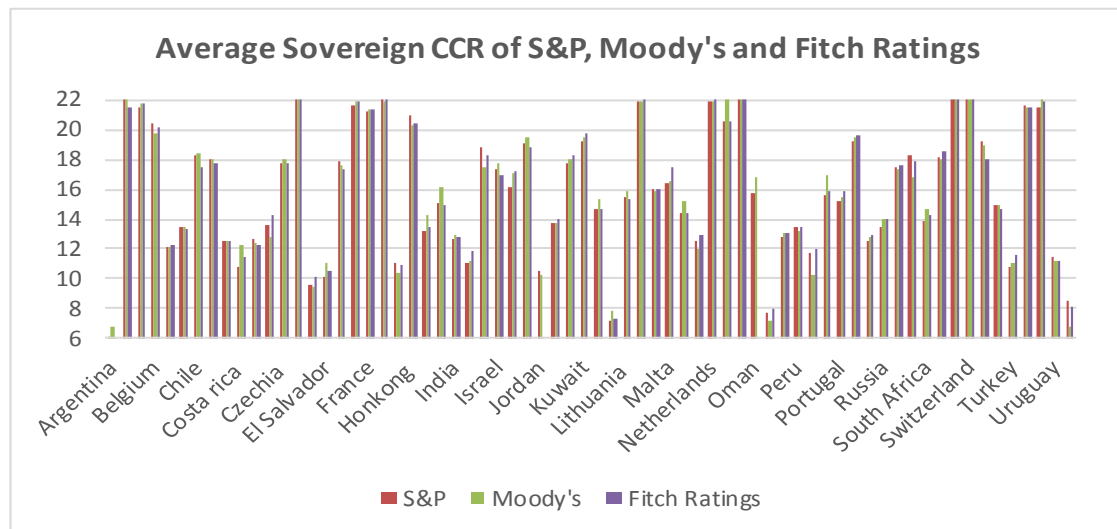
Figure 3: Average ratings of the Three Big CRAs for 2004-2017 period

Source: Bloomberg

When S&P, Moody and Fitch Ratings' country ratings are examined, it is seen that they give similar notes and they follow each other over time. As seen in Figure 3, the grades

of the three major CRAs are substantially the same. Analyzing the credit ratings of three big CRAs ratings for 2014-2017 period, S&P and Fitch have a correlation of 0.98, S&P-Moody's and Fitch-Moods have 0.97 correlations compared to each other.

CHAPTER 2

CRITICISMS TOWARDS CREDIT RATING AGENCIES AND RISE OF CREDIT DEFAULT SWAPS

2.1. CRITICISMS TOWARDS CREDIT RATING AGENCIES

As stated in the previous sections, the main function of CRAs is to measure the capacity and willingness of the borrowing institutions to repay their debts, in other words, the creditworthiness of loans. CRAs who have been performing this duty for almost 150 years have been criticized for many reasons in these critical tasks from time to time. The recent global financial crisis that erupted in 2007 has caused this criticism to increase. The high credit ratings of the risky government bonds caused CRAs to be questioned. This situation negatively affects CRAs, whose income depends on their reputational capital. Criticisms towards CRAs are classified under four main headings.

2.1.1. Lack of Transparency in Credit Rating Agencies

CRAs use certain analyzes and methods for credit valuation for their customers. These methods and the data used are not disclosed due to the fact that they are a sector where money is earned based on these information. But this causes the rating agencies to turn into a closed box. The fact that these variables are not published due to commercial reasons, is criticized by both borrowers and investors. In particular, there are important questions about how quantitative inputs used in the grading method are calculated and how important they are.

The CRAs publish reports describing the grading methods from time to time, taking into account criticisms towards them. While the report contains information on the grading system, uncertainties in how the final version of the note issue is given and how the relative position of countries is determent are not satisfied by these reports. In particular, lack of information about how to measure subjective issues such as political

stability and expectations that are included in the ratings undermines the objectivity and credibility of these organizations. Alexe et al. (2003) defines ratings as an output of the black boxes due to undisclosed grading systems and benchmarking methods of the CRAs (Figure 4).
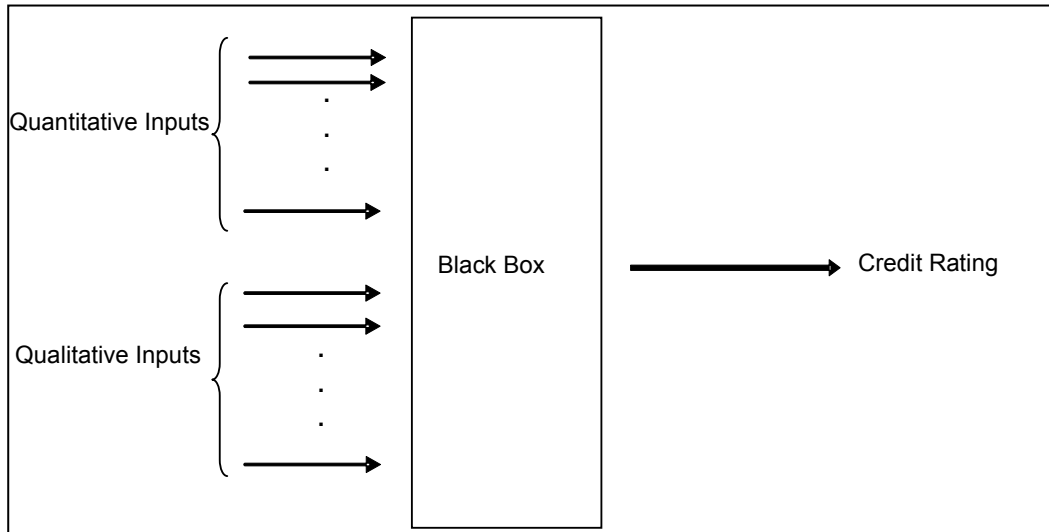
Figure 4: Credit Rating Process

Source: Öztürk, 2011

There are also criticisms from the leaders of the countries. Indeed, Japanese Prime Minister Junichiro Koizumi mentioned that it was unfair of receiving similar notes with African countries which Japan gives development assistance, after downgrading of Japan's credit rating (Alex et al., 2003).

Sharing credit rating process with the public more clearly will also lead rating agencies to be more consistent while deciding ratings. In Turkey, political figures and also academicians sometimes criticize CRAs for giving same or better ratings to some countries that are in similar economic and political condition, even in poor condition compared to Turkey.

2.1.2. Lack of Competition in the Credit Rating Market

As mentioned in the previous sections, three major companies in the credit rating area dominate over 90 percent of the global market. The oligopolistic structure in the credit

rating market has deepened with some regulations and licensing rules. Although market concentration is not sufficient to say that there is no competition in the market, this so high rate of concentration strengthens the lack of competition.

This situation is exacerbated by the necessity of some financial institutions to be graded by at least two CRAs. Currently, the competition among CRAs is declining because of the fact that 90% of the companies needs to be graded by two firms in the credit rating market, which is shared by 3 firms. According to the US Department of Banking, Housing and Urban Affairs Senate Committee Report, the credit rating market is managed by Moody and S&P, the two largest companies, as joint monopoly and no competitive environment exists in the market (Darbellay, 2006).

CRAs are trying to expand their market shares and maintain their market dominance through various methods. S&P and Moody's grade all major corporate bonds in the US markets, whether or not demanded. Thus, these institutions do not leave unrated bonds in the market and aim to prevent companies from avoiding rating. The firms that had been rated although they did not request, had applied to the law but could not get results. In Poon's study (2003) conducted on 256 issuers from 15 countries given by S&P, it is concluded that the credit ratings given in the unqualified ratings are lower than the ratings made on demand. Frost (2007) explains this situation in two ways. First, companies that do not require a credit rating are usually companies with a weak financial structure. Secondly, CRAs do not have sufficient knowledge of firms that do not require credit ratings, so they are rated according to available data, which leads to low ratings. As a result, bond issuers are forced to cooperate with these CRAs even if they request it or not. By this way, CRAs prevent two different credit rating agencies from operating in separate fields within a company and prevent other firms taking share from that company.

2.1.3. Conflict of Interest

CRAs face many kinds of conflicts of interest in many respects which are explained below.

2.1.3.1. Funding Mechanism of CRAs

From the beginning of the 1900s, when credit rating activities first emerged, until the early 1970s the CRAs were earning their revenues from the sales of the ratings and reports they published. In this case, the principal customers of the CRAs were investors. In the 1970s, CRAs changed their income strategies and saw issuers of securities as their customers, not investors. Syyla (2002) summarizes this situation as follows; *"If the CRAs are considered the key invention of the previous period, the key invention of this period is the way in which these institutions finance themselves, given the recent growth of the CRAs".*

The fact that the CRAs earn their income from the institutions and firms that they have graded, brings to mind "the more money the higher the rating" risk. As a matter of fact, Tom McGuire, a former vice president of Fitch Ratings, confirms this situation by saying, "the pressure of investors getting high marks, and the need for reliability of CRAs is always on a sensitive balance" (Becker and Milbourn, 2011). According to Covitz and Harrison (2003), this conflict affects CRAs, especially in slow downgrading situations and lowering credit ratings below investment grade levels. Although these organizations have stated that they reliability and reputation are their original capital, the criticisms about this issue still continue.

2.1.3.2. CRAs Also Provide Consultancy to the Companies They Give Ratings

In addition to credit rating services, CRAs also provide risk analysis and management services and sell data, analysis and risk models to firms and countries. This leads to a conflict of interest, as it is unlikely that a CRA will be able to reduce the rating of a company or country where it gives consultancy service or sell risk management systems.

Frost (2007) states that analysts and academics argue that the CRAs have been positively discriminating against the organizations they give consultancy services, but also mentions that it is too difficult to test this discrimination by hypothesis testing due to need of many related variables.

2.1.3.3. Staff Transfer between Credit Rating Agencies and Other Organizations

There is a significant amount of human resources in CRAs that are educated and have work experience. The personnel working in these organizations are transferred to various organizations from time to time. Although this situation is seen as a natural process, it causes some conflicts of interest. In particular, the transfer of a CRA staff to an organization that has been graded by this CRA, provides some information advantages for these issuer companies. In addition, the bilateral relations of the transferred personnel with in the previously worked CRA are also an advantage for the company to which he/she has been transferred.

Significant arrangements have been made by the SEC in the United States to prevent such conflicts of interest. The main aim of the regulations is to seperate the CRAs and borrower institutions as far as possible in order to prevent conflicts of interest. In addition, the relations of the issuer institutions with the CRAs staff are even regulated. With a law enacted in 2006, the SEC was given authority on these issues, and in 2008, the SEC issued a wide-ranging communiqué which regulated these relations. For example, it was stated in the SEC communiqué that the staff working in the credit rating field cannot receive a gift more than $ 25 in value from the issuing issuer (Hoffinger, 2009: 9).

In particular, CRAs oppose the amendment of the payment by the issuer of credit ratings (issuer-pays model). As a reason, they claim that this model ensures the spread of the rating information in the market faster and wider (Hunt, 2009). Manns (2012) acknowledges that although user-pays model will prevent some conflicts of interest, the user who pays for credit note information will naturally prevent this information from being accessed by the public and this will disrupt market discipline.

Some researchers think that there is no need to make arrangements in this area because the CRAs earn money on their reliability and reputation. These kind of mistakes that will be made in order to increase their short-term profits will lead to very large business and income losses in the medium and long term. This view, which is called the reputational model, argues that when a transparent and competitive market is established in this field, the quality of the grades given by the CRAs will be evaluated by the investors and they will get the value they deserve in the market.

2.1.4. CRAs Can Not Foresee Crises and Deepen Current Crises

CRAs are often criticized by many academicians and writers, as well as business and policy world, because of failing to foresee the crisis although they constantly monitor the economic and social developments. In a study conducted on the effectiveness of the CRAs, Partnoy (2002) emphasizes the paradox of rapidly growing market value contrary to decreasing credibility of these institutions. Reinhart (2002) also made a similar study and concluded that the notes of the CRAs did not have the power to predict the crises. Reinhart attributed this to the grading methods of the CRAs and the data they used are far from explaining the country's debt management capacity. Božović (2011) refers to Reinhart's article and emphasizes that the situation has never changed after the publication of the article.

The main criticism towards the CRAs is that they deepen the crisis with the downgrades they have made in addition to not being able to foresee the crises. Small-scale crises in the countries are immediately under scrutiny by rating agencies and may result in a gradual decline in credit ratings. Ulrich Hocker, a member of the German Stock Exchange Traders Association, illustrates the financial crisis in Asia at the end of the 1990s as an example of the bad experience of international rating agencies. According to Hocker (Deutshche Welle, 2007), the financial crisis in Asia in the 1990s actually emerged as a problem of the CRAs. The countries which got good grades from CRAs one day before, had declared good bankruptcy the next day. For countries entering the crisis, large scale note reductions have been realized by the CRAs. These note discounts

push the developing countries into a deep downturn and deepen the crisis, expanding the crisis exit process and expanding the effects of the crisis. Moreover, the globalization process and capital movements, which have increased since the 1990s, have led to the transformation of these individual crises to regional and even global crises. Some economic crises deepening in this way can be listed historically as follows.

2.1.4.1. Mexico Crisis:

As a result of the economic liberalization program that began in 1988, Mexico, where macroeconomic stability was developing, provided a healthy growth environment that could be a model for developing countries. The Mexican economy, which grew 3.1 percent in 1989-1994 period annually, recorded approximately 100 billion dollars of foreign capital inflows and experienced a tenfold growth in its stock exchange (Kübalı, 2000). Despite this situation, due to the rapid increase in the current account deficit, the rapid increase in the private sector credits and the continuation of the anchor-based exchange rate policy, the rise in international interest rates and political uncertainties, international confidence in the Mexican economy began to weaken.

As a result of the increasing pressure, the Mexican government turned to floating exchange rate regime which resulted in a significant depreciation of the pesos. This caused interest rate fluctuations and deterioration in the financial sector. While the balances that started to deteriorate caused international investors to withdraw their funds, the CRAs, which could not foresee this situation, realized consecutive note discounts. First, S&P and Moody's lowered Mexico's credit rating and set the credit outlook as negative. These note discounts increased the panic environment and accelerated capital outflows. In January 1995, in order to overcome this crisis, a 50 billion dollars US aid package was prepared and presented to Mexico under various conditions. With this source, the crisis was slowed down and the foreign exchange reserves increased by 100 Billion USD in 1995. As a result, the economy started to give positive signals (Arıcan, 2002). As a matter of fact, following the 5.8 percent contraction in 1995, the Mexican economy grew by 5.9 percent and 7.0 percent in 1996 and 1997, respectively.

2.1.4.2. Southeast Asia Crisis:

When the crisis period in Southeast Asia is examined, it is seen that the rapid increase in macroeconomic balance of loans to the private sector and the increase in the debts of the private sector to the banks in parallel with Mexico, the overvaluation of national currencies due to capital inflows and the increase in current account deficit are the main reasons leading to the crisis. For these reasons, the accelerated capital outflow caused the national currencies to lose great value against the dollar and the stock prices hit the bottom. Firstly, Thailand's currency, Baht and the stock market collapse resulted in quick rating reductions by CRAs.

The crisis that started in Thailand brought about the confidence crisis in the economies of other countries with similar economic conditions, and turned into a regional crisis and affected many South Asian countries and Japan (Birdişli, 2012). During this crisis, countries in the region experienced the most severe credit rating declines in their history. For example, South Korea's "AA-" grade, which was given by S&P until October 1997, has been reduced to "A +" with a negative appearance on 24 October 1997 and rating cuts came one after the other and the country grade decreased by 9 levels to "B +" until end of the year (Table 1.6). Similar situations occurred in other Asian countries. When South Korea's ratings were reduced to speculative levels, Indonesia, Thailand and Malaysia were also given notes below investment grade.

Table 6: Rating Cuts of South Korea by S&P in crisis period

Date	Long Term FX Rating	Outlook
3 May 1995	AA-	Positive
24 Oct 1997	A+	Negative
25 Nov 1997	A-	Negative
11 Dec 1997	BBB-	Negative
22 Dec 1997	B+	Negative

Source: Bloomberg

The sudden liquidity shortage and heavy devaluations in the crisis caused the financial institutions and firms to disrupt the balance sheets and caused great losses and loss of confidence in addition to great losses in production and employment (Celasun, 2002:

169). As a way out of the crisis, Thailand, Indonesia and South Korea agreed on the stand by arrangement within the framework of the reform package foreseen by the IMF. As a result, with the financial support of countries such as the USA, EU, Japan and Australia and international financial institutions such as the IMF, World Bank and the Asian Development Bank; credits given to South Korea (57 billion USD), Thailand (17.2 billion USD) and Indonesia (23 billion USD). The agreement between the Philippines and the IMF which was in force before the crisis, continued. Together with many financial and financial arrangements, these countries have tried to correct their financial systems. Nevertheless, these countries have worked for many years to achieve their old performances.

2.1.4.3. 1998 Russia Crisis

After the collapse of the Soviet Union in 1991, the Russian economy experienced a rapid transformation. Since 1992, important steps have been taken for the transition to the market economy, prices have been released, liberalization in foreign trade has been initiated and privatizations have begun. By the end of 1997, it is estimated that approximately 80 percent of the total enterprises in Russia belong to the private sector (Burhan and Mustafaoğlu, 1998).

However, one of the most important problems of the Russian economy in the same period is the financing of budget deficits exceeding 8 percent by short-term borrowing. In order to pay the old debts and wages, the Russian Government has started short-term borrowing since 1995 (Karluk et al., 1999). Relatively higher credit ratings from CRAs to Russia compared to countries such as Argentina and Turkey in this period, has facilitated the borrowing of the Russian Government. The high rate of short-term debt stock has been unsustainable due to the emergence of external finance shortages. This situation combined with the political turmoil has increased concerns about the Russian Federation since the end of 1997 and led to the formation of panic in the markets. During these developments, the CRAs sharply lowered Russia's credit rating in a short period of time.

Table 7: Rating Cuts of Russia by S&P in crisis period

Date	Long Term FX Rating	Outlook
07 Oct 1996	BB+	-
12 Feb 1998	BB+	Negative
10 March 1998	BB+	-
5 June 1998	BB+	Negative
7 June 1998	BB	Negative
30 July 1998	BB-	-
17 August 1998	B-	Negative
27 August 1998	CCC	-

Source: Bloomberg

The credit rating of Russia, which was announced as "BB+" by Fitch Ratings on June 5, 1998, declined to "CCC" on 27 August 1998 which corresponds to 7 points in 7 weeks (Table 7). The Russian government has significantly increased interest rates, reduced the value of the Ruble to around 30 percent, and declared a 90-day moratorium (Yay et al., 2001). As a result of the agreements signed with the World Bank and the IMF, Russia has been able to solve the cash problems in a little bit.

2.1.4.4. 1998-2002 Argentina Crisis

Due to macroeconomic stability and confidence in national financial markets since the mid-1990s, foreign investors' speculative portfolio investments in Argentina have increased rapidly. The Argentinian economy which had been growing in this way with hot money has entered into a continuous spiral self-recurring crisis of crisis as a result of many internal and external factors such as; Mexico's crisis, the rise of interest rates in America, the declaration of Russia's moratorium in 1998, Brazil in 1999 and the devaluation due to deterioration of balance of payments.

The impact of the Asian crisis in 1997 and the Russian crisis in 1998 was also reflected to other developing countries through financial and commercial channels. In particular, the decline in appetite of global investors for developing countries after financial crises and their return to developed countries have affected the countries with significant dependence on foreign financing. Moreover, the economic contraction in Brazil which is the most important trading partner, had a major negative effect to the exports of

Argentina and reduced its foreign exchange revenues. While the Argentinian economy, which had been having difficulties due to external factors, was about to recover, the crisis had deepened with the policies implemented in 1999. The government's policy to increase the tax rates to reduce the budget deficit in order to gain the trust of investors and increase the external financing again, caused an adverse effect on the economy.

The contraction in the economy reflected in tax revenues and led to a decline in tax revenues, contrary to what the government had expected. In 2001, the fact that economic growth still could not be achieved led the government to increase the interest rates to exit the crisis with external financing. However, the decrease in tax revenues and the policy of increasing interest rates reduced the confidence of the Argentinian government in debt management and increased the risk premiums. Moreover, the increase in interest rates also affected the investments and decreased the private sector's contribution to growth. This situation, which is called debt trap has also activated CRAs and Argentina became default after successive note reductions (Saxton, 2003) (Table 8).

Table 8: Rating Cuts of Argentina by Fitch Ratings

Date	Long Term FX Rating	Outlook
3 Dec 1997	BB	-
21 Sep 2000	BB	Negative
20 Mar 2001	BB-	Negative
28 Mar 2001	B+	Negative
11 Jul 2001	B-	Negative
12 Oct 2001	CCC-	Negative
2 Nov 2001	CC	Negative
6 Nov 2001	C	Negative
3 Dec 2001	DDD	-

Source: Bloomberg

In this period, Argentina demanded 1.3 billion dollars emergency loan from the IMF to service its debts. Although this request was rejected, the debt payment was postponed. In 2002, the exchange rate regime shifted to floating exchange rate and peso significantly devalued. Thereby, increasing exports and decreasing imports helped to recover external balance. 2003 was a good year of agricultural harvesting, in addition a significant increase was observed in tourism revenues. In June 2003, a stand-by

agreement was signed with the IMF and 320 million USD was released. Thus, the Argentine economy, which contracted by 11 percent in 2002, tended to recover again and achieved a 9 percent average economic growth of in the 2003-2005 period.

2.1.4.5. Global Financial Crisis

With the advancement of technology in recent years, financial markets have shown great developments. As a result of this change in financial markets, financial products have gained diversity. This situation revealed the concept of asymmetric information and risk. The 2008 global crisis, which first appeared in the US housing market and the banking sector as the result of the asymmetric information and risk in the financial markets, influenced the global economy in a short time.

After 2000, liquidity surplus started to emerge in US banks. In order to benefit this, banks started to give precarious loans to individuals under the name of home loan. The only basis of these loans, which are not based on any assurance, is the mortgaging of the house to be received by the lending bank. As a result of this transaction, people who want to be a home owner and who do not have a certain cash value demanded loans from banks and this situation caused the house prices to increase excessively. In the crisis that started to erupt in 2007; the houses of people who cannot pay the credit debt to the banks are confiscated and introduced to the market for liquidity. As a result of this transaction, with the decrease in house prices, people who wanted to buy housing with credit and who made their loan payments on time, protest the banks with the falling housing prices below the amount of the loan. After the excessive decline in housing prices, banks faced liquidity problems. On the other hand, as a result of the deepening of financial instruments, banks started to produce and export securities in line with the loans granted. As the housing prices declined, the risk in banking started to spread to other sectors.

CRAs played an important role in evaluating structured products and publishing information. Investors also rely on these assessment and rating information when

making decisions. However, the fact that credit rating agencies could not evaluate the structured credit products correctly led to fluctuation problems in the markets. In particular, due to the fact that the credit rating agencies' high ratings on complex structured subprime loans were based on insufficient historical data and some models used in the rating did not work well, investor interest and trust in securitized products; in all financial services has decreased. This led to an increase in the intensity of financial fluctuations (BRSA, 2008).

Table 9: American Economy in Pre-Financial Crisis of 2008

2007 July	2007 August	2007 September	2007/Q4 and after
Subprime/ Credit Crisis	Liquidity crisis	Credit and liquidity crisis continues	
* Markets were shocked by subprime loan payments. * Financial products based on subprime loans were re-evaluated. * Investors with high profile were damaged. * Investors began to avoid risk. * Credit risks were re-priced. * Investors sold their cash assets.	* First results of the Credit problems were began to be observed. * Risk appetite decreased. * Investors were reluctant to take asset-based financing bills. * Short-term financing demands occurred. * Banks began to keep cash to meet demands. * 3 months libor rates increased. * Borrowing costs were affected negatively.	* Liquidity deficit continued * Banks still continued to borrow short-term and increased interest rates. * Conditions for new credit users tightened * ECB, FED and BOE provided emergency liquidity with delay. * FED lowered interest rates by 0.5 percent.	* High interest rates * Speculative behaviors negatively affected credit users. * Reduced consumer's risks.

Source: Hasbi, 2012

The high ratings given by the credit rating agencies in the US before the crisis attracted attention. As a result, the credit rating agencies, which were exposed to many criticisms, were brought to justice after a while. In his defense, Raymond McDaniel, the chief of

the Moody's company, claimed that, they gave high ratings to instruments that they would not really give high marks, as a result of the virus's effect on the system (Bayramoğlu, 2012).

The President of the US House of Representatives and the influential names of the Congress insisted that Moody's, S&P and Fitch Ratings, deliberately scored high on mortgage-backed securities. Having questioned the top executives of all three rating agencies and reviewed their official company documents, President of House of Representatives has made it clear that these organizations are abusing trust. It is understood that the experts in the committees to rate mortgage-backed papers gave their notes to the securities they invested their personal money (Tutar et al., 2011).

2.2. CREDIT DEFAULT SWAPS

As stated in previous sections, the most important indicators that show the countries' riskiness are generally accepted as the sovereign credit ratings. On the other hand, the criticisms towards credit ratings and decrease in their reputation led financial actors find alternative ways to measure credit risk. Credit Default Swap (CDS) is among the top alternatives. CDS is defined as a credit derivative instrument that protects the CDS buyer against the risk of non-repayment of the loan in case of a default (Kliber 2011: 112).

2.2.1. Structure and Mechanism of Credit Default Swaps

CDSs are the most preferred product in the credit derivatives market. CDS were first engineered by the US bank J. P. Morgan Inc. in 1994 to transfer credit risk exposure from its balance sheet to CDS sellers. At that time, no one could have imagined the expansion of CDS market in such an amount and the entering the daily lives of financial traders and regulators in the 21th century (Augustin et al., 2016: 2).

The main reason underlying the CDS contracts being so favored by the financial markets is that it allows the users to effectively manage the credit risk that the product

has to carry, just like in a classic insurance policy. Initially, CDSs, created to eliminate existing credit risk, have become a tool of protection and speculation at the same time. Especially in 2000s, the insignificant growth in credit default swaps shows that credit default insurance is being bought and sold in these markets much more than the current bond amount.

As stated in Figure 5, in CDS contracts the party receiving the protection agrees to make periodic contributions (2) to the guarantor selling the protection during the term of the contract to get payments in case of a default reference default in the reference asset. On the other side of this agreement, the seller of the protection (the guarantor) shall pay (3) the premium collections and the default value in the reference asset in case of default. In this way, the CDS contract is categorized as the simplest and most preferred financial product of the credit derivatives market (Das & Sarin, 2006).
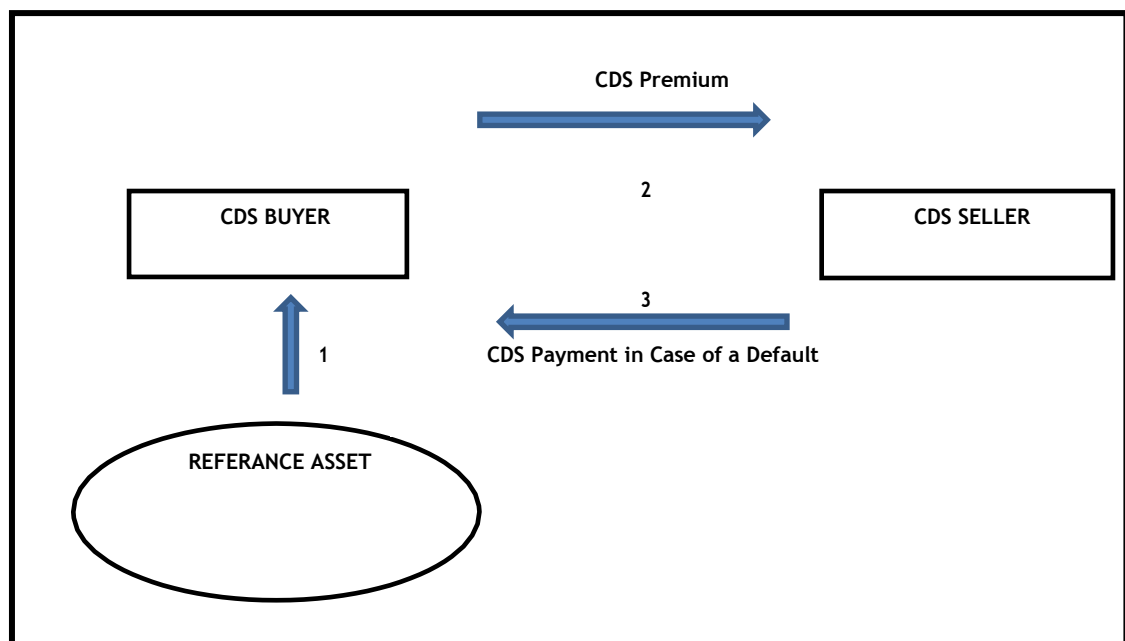
Figure 5: Credit Default Swap Mechanism

Source: Akkoyunlu, 2011

In CDS contracts, the default event is defined as the situation in which the companies, banks or sovereigns, in particular the developing countries, fail to repay the bonds they

discharge. An investor who carries a credit risk continuously because of an asset in his portfolio does not necessarily have to only be a party to contracts where this asset is referenced, to eliminate or reduce the credit risk. The investor may be a party to a CDS agreement referring to a third entity which is closely related to and has the potential to significantly affect the reference asset in case of a default. For an investor who wishes to hedge the credit risk, becoming a party to a CDS contract, where the default event is defined as a failure to fulfill a third entity's obligations, will sometimes be an adequate means to reach the objective. Das and Sarin (2006) gives an example of an international bank which is willing to lend to a firm operating in the cement sector in a developing country. In this example, the bank would like to give credit to the cement company, on the other hand the bank is concerned that the financial situation of the company may deteriorate at any time and the bank may not recover its money. In such a case, if the bank buys a CDS contract that refers to the previously issued bonds of the developing country, it will have achieved the protection against the event of default. The default event referred to in the CDS contract purchased by the Bank is not obliged to be defined as the default of that country. Any special circumstances that might have caused a decline in the rating of the country by the credit rating agencies or that would cause the secondary market value of the bonds to be significantly reduced could be determined as a default case. The bank acquiring this type of CDS contract will have easily provided the protection against the credit risk of the cement company.

2.2.2. Intended Purposes of Credit Default Swaps

2.2.2.1. Risk Management

In case of a large amount of credit usage from a bank as a customer, it causes the risk of the bank to concentrate on that customer (sovereign, company or sector). For this reason, banks transfer a certain portion of the accumulated risk to a third party by purchasing credit default swaps. Thus, the bank decreases the risk of losing customers and the company does not have to go to search for a new bank. The reason why the bank applies to CDS is that it can do the same by means of portfolio differentiation,

securitization or loan sale, and these methods make them have to bear much more cost, while CDS contract guarantees itself with less cost (Turguttopbaş, 2013).

2.2.2.2. Capital Support

CDSs make it possible to calculate the loan provision or capital requirement from the bank balance sheets for the reference asset at a lower rate with the assurance that it provides. This situation creates an advantage for the bank by decreasing the cost of resources. Also, in case of realization of the credit event, it prevents the bank from entering the capital shortage to provide enough funds to cover all the risks of the bank (Turguttopbaş, 2013).

2.2.2.3. Measure of Credit Risk

Theoretically, in an ideal environment, the risk premiums in the bond market and the CDS spreads should behave in the same way due to the possibility of arbitrage depending on the integration of the two markets. In practice, these two indicators have several significant differences. First of all, bond yields, other than credit risk, are also affected by other factors such as liquidity risk and interest rate. Similarly, CDS spreads cannot easily be converted to the probability of default due to the uncertainty of recovery rate, counterparty risk and certain contract details. In addition, CDSs allow the credit risk to be separated from the interest rate risk, which is the source of uncertainty of the pricing mechanism (Alper, 2011: 84).

Even, the margins of CDSs may not fully reflect the probability of default since the value of the provision is not known when the credit risk is realized. On the other hand, it has been suggested that the increase in speculative transactions may increase the borrowing costs by affecting the pricing policy of the related entities in the market (Turguttopbaş, 2013: 39).

2.2.2.4. Speculation

Another purpose of the CDS contracts is to generate returns by speculating. For speculative purposes, CDS traders have positions on the market according to the CDS current prices. If the investors think that the prices are high in the market, to gain profit through speculation they take short position and if they think it is below what it should be they take long position. Another factor that drives investors to take positions for speculative purposes is the expectation of the investor for the future situation of the securities holder. If the investor believes that the company in which the reference debt belongs, even if the company is in default, can fulfill its obligation, it may purchase the CDS of the company while the price is low and vice versa. (Schöpf, 2010: 8).
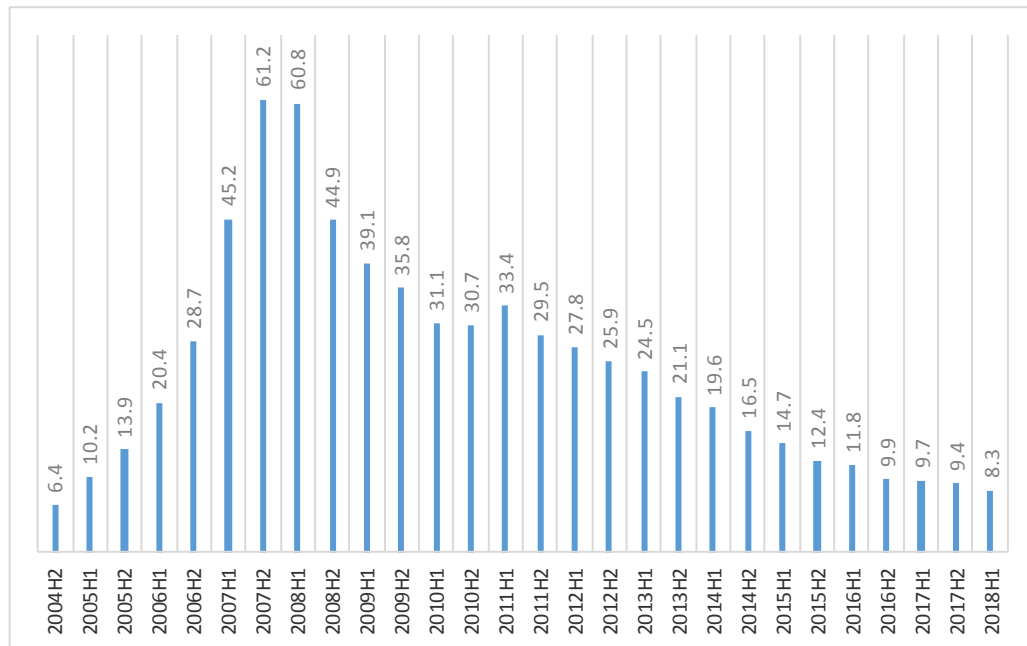
Figure 6: Annual CDS Notionals Outstanding (Trillion USD)

Source: BIS Semiannual OTC Derivatives Statistics (online, 21.12.18)

The speculation motive led the CDS market grew rapidly. Although the first modern CDS was introduced in 1995, the market grew faster in the 2000s, reaching 28 trillion by the end of 2006 and approximately $ 60 trillion in 2007 (Figure 6). This is about 1.1 times the world GDP of the relevant year.

As mentioned above it is possible to earn money by CDS speculation even in default cases. The best example for this situation is given in the book of Michael Lewis, titled "The Big Short: Inside the Doomsday Machine (2010)". The book explains how the main actors in the creation of the CDS market bet against collateralized debt obligation (CDO) bubble in the mortgage system and thus how they made enormous amount of profit from the 2008 financial crisis in USA. The book states that poorly structured loan packages known as CDOs got very high ratings such as AAA and exacerbated the mortgage crisis. The irrationality of this growing and extremely leveraged trade in the mortgage derivatives was not foreseen by neither government institutions nor credit rating agencies. The ones who saw this unnatural conditions benefited from the default of the mortgage backed securities with CDS contracts. Explaining the reasons of the financial crash, the book got attention of all world and spent more than six months on The New York Times' non-fiction bestseller list. Also, commercial success ($133 million revenue against a $50 million budget) of The Big Short movie (2015), based on the book is an important indicator of people's attention on the crisis.
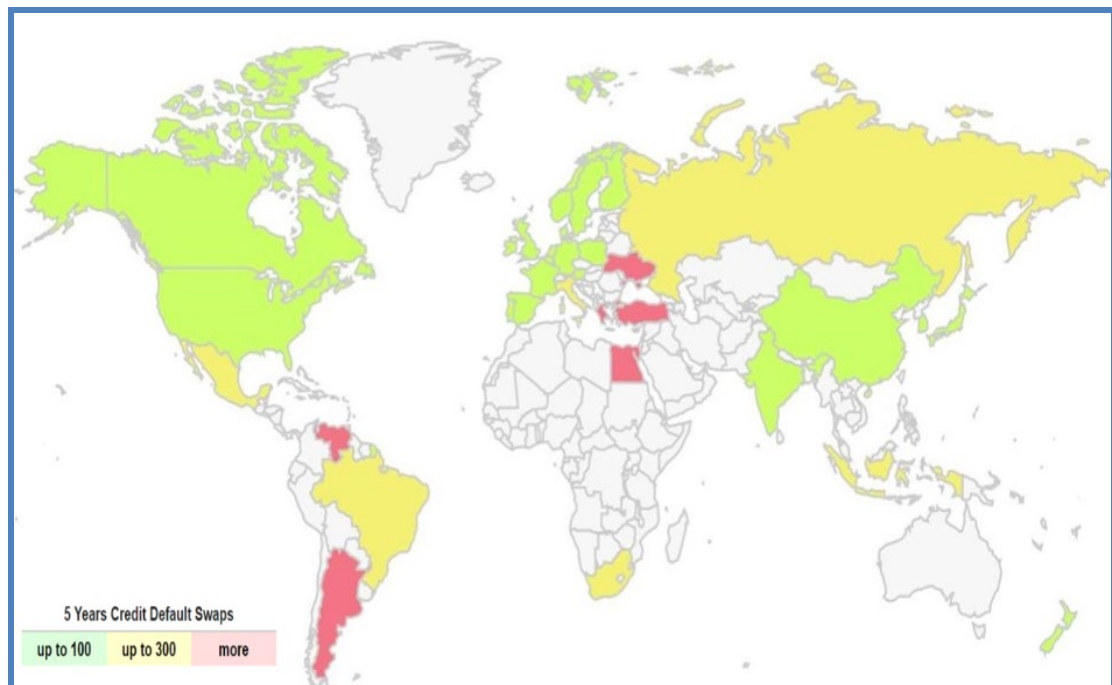
Figure 7: 5 Year Sovereign Credit Default Swaps

Source: World Government Bonds (online *Last Update: 12 Mar 2019*)

Following the global financial crisis in 2008, CDS contracts declined by nearly 50 percent until 2010 and realized as 30.7 trillion dollars in 2010. Due to the cautious attitude of markets to credit derivatives after the 2008 global crisis, besides European debt crisis, the total outstanding of CDS contracts has continued decline since 2010 and became 8.3 trillion US dollars in the first half of 2018.

Table 10: Credit Ratings and 5 Year CDS Premiums of Selected Countries

Country	S&P Rating	5 Years Credit Default Swaps				
		5Y CDS	Var 1m	Var 6m	PD (*)	Date
Denmark	AAA	10.79	+1.31 %	n.a.	0.18 %	12 Mar
Norway	AAA	11.00	-1.79 %	-2.65 %	0.18 %	12 Mar
Germany	AAA	11.70	-10.00 %	+18.18 %	0.20 %	12 Mar
Netherlands	AAA	12.30	-6.82 %	+4.24 %	0.21 %	12 Mar
Austria	AA+	12.46	-2.20 %	n.a.	0.21 %	12 Mar
Finland	AA+	13.05	+0.38 %	n.a.	0.22 %	12 Mar
New Zealand	AA	16.00	-20.40 %	-5.88 %	0.27 %	12 Mar
United States	AA+	16.40	-7.34 %	-9.89 %	0.27 %	12 Mar
Sweden	AAA	20.40	0.00 %	0.00 %	0.34 %	12 Mar
Japan	A+	20.90	0.00 %	-13.28 %	0.35 %	12 Mar
Belgium	AA	24.40	-9.96 %	+10.41 %	0.41 %	12 Mar
United Kingdom	AA	28.10	0.00 %	0.00 %	0.47 %	12 Mar
South Korea	AA	29.84	-7.44 %	n.a.	0.50 %	12 Mar
France	AA	30.00	-18.03 %	+25.00 %	0.50 %	12 Mar
Canada	AAA	34.60	+0.87 %	+20.14 %	0.58 %	12 Mar
Ireland	A+	36.70	-10.71 %	+15.05 %	0.61 %	12 Mar
Hong Kong	AA+	38.30	+5.22 %	+19.31 %	0.64 %	12 Mar
China	A+	49.46	-9.89 %	n.a.	0.82 %	12 Mar
Spain	A-	61.30	-19.97 %	+1.83 %	1.02 %	12 Mar
Poland	A-	65.00	-0.91 %	+1.56 %	1.08 %	12 Mar
Portugal	BBB-	69.30	-22.31 %	-23.00 %	1.16 %	12 Mar
India	BBB-	84.78	-14.94 %	-15.94 %	1.41 %	11 Mar
Indonesia	BBB-	103.80	-8.96 %	n.a.	1.73 %	12 Mar
Mexico	BBB+	117.19	-11.91 %	+3.11 %	1.95 %	11 Mar
Russia	BBB-	121.97	-10.18 %	-27.11 %	2.03 %	11 Mar
Brazil	BB-	154.90	-10.51 %	-45.88 %	2.58 %	12 Mar
South Africa	BB	177.27	-4.72 %	-25.13 %	2.95 %	11 Mar
Italy	BBB	196.10	-14.10 %	-12.14 %	3.27 %	12 Mar
Turkey	B+	317.14	+4.61 %	-36.45 %	5.29 %	11 Mar
Egypt	B	323.00	-9.89 %	-6.63 %	5.38 %	11 Mar
Greece	B+	362.20	-12.39 %	-6.21 %	6.04 %	12 Mar
Ukraine	B-	631.37	+4.71 %	+54.54 %	10.52 %	11 Mar
Argentina	B	704.06	+17.45 %	+6.14 %	11.73 %	11 Mar
Venezuela	SD	72150.20	0.00 %	0.00 %	100.00 %	12 Mar

Source: World Government Bonds (online *Last Update: 12 Mar 2019)*

2.2.3. Credit Event

A credit event is the condition for the protection vendor to impose a default payment to the protection buyer. In other words, when the credit default swap occurs in the swap contract, the protection vendor makes a certain default payment to the buyer. In a loan default swap contract, it should be clearly stated that the credit event or the conditions under which the default is deemed to have occurred.

In a credit derivative contract, it is not enough to define only credit events. In the credit derivative contract, the conditions under which the credit event should be deemed to have occurred should be defined clearly. In the "Credit Derivative Definitions" documents published in 1999, 2003 and lastly 2014 by International Swap and Derivatives Association (ISDA), the types of credit event are defined under six headings. The parties may choose one, several, or all of these credit events, but they also have the right to determine a credit event. Credit events defined by ISDA are; bankruptcy, obligation acceleration, obligation default, failure to pay, restructuring, and repudiation/moratorium ISDA (2014; 36). These six credit events mostly explain the cause of the decline in the credit quality of the reference institution or the reason for the decrease in the value of the reference asset. The following table describes the Credit Events Used in Credit Default Swaps (Alper, 2011: 90).

Table 11: Credit Events Used in Credit Default Swaps

Credit Event	Definition
Bankruptcy	If the reference institution is a company, it is a decision of failure when it is not rational to continue its operations or it cannot fulfill its obligations.
Failure to Pay	Failure to fulfill its obligation.at the maturity of the reference institutions,
Restructuring	In the case of changes in reference conditions or obligations, it is based on the material restructuring of payment obligations.
Obligation Acceleration	In the case of default of the reference party prior to the due date, the demand from the protection vendor to accelerate the fulfillment of the related liability.
Default	The case of inability to of the reference institutions to pay the debt.
Repudiation/Moratorium	The case that the reference institution decides not to pay the debts or to postpone its debts. It can be the case when the borrower is a country.

Source: Alper, 2011

Credit events are realized as changes in credit views and ratings. It would be correct to say that the number of negative credit events are increased after the 2008 crisis. The reason for this is that CRAs reduce sovereign ratings in order to regain their questioned reputation (Turguttopbaş, 2013: 59)

2.2.4. The CDSs and Financial Crisis

The US mortgage crisis, which occurred with the bankruptcy of Lehman Brothers in September 2008, has affected the economies of other countries on a global scale. In the last decade, Europe as the most powerful partner of the USA which is the starting point of the crisis, has been affected by this crisis. The mortgage crisis has turned into a credit crisis and the credit crisis has become a debt crisis for some countries. In this process, Greece, Ireland, Portugal and Spain lived serious difficulties in sustainability of debt. Institutions such as the European Central Bank (ECB) and the IMF have sought to overcome the effects of the crisis through financial support and sanctions. In order to get a better understanding of the topic, the following sections of the thesis will give information about the EU debt crisis of 2009-2010 with the US mortgage crisis of 2007-2008 and the CDS premiums, which are an indicator of country risk during the EU debt crisis process.

2.2.4.1. 2007-2008 US Mortgage Crisis

The period of 2000-2006 is known as the years when cheap credit policies were applied for the US economy. On the other hand, one of the most important details that draws attention in this period preceding the outbreak of the mortgage crisis is that home prices are very high and households that want to be homeowners can borrow and have low interests. While households that want to buy a house must have at least 20% of the house value before, credit regulations had been changed and this requirement has been abolished (Hull, 2009: 531). This situation paved the way for those who do not have the financial source to pay but who borrowed at low interest and wished to become homeowners. Thereby, the mortgage loan distributed increased exponentially over time. On the other hand, a number of financial derivatives (such as asset-backed securities)

have been developed over mortgage loans and existing liabilities have multiplied. For instance, state-funded institutions, such as Fannie Mae and Freddie Mac, pioneered the formation of secondary mortgage markets, and created securities to help investors invest money and gain profits (Joseph, 2013)

On the other hand, due to the inadequate payment power of households with mortgage loans and the inability of households to pay their loans and the excess supply in the houses, the values of houses sold at high prices have fallen. This caused a significant increase in non-performing loans of the banks. In this process, institutions such as Lehman Brothers have declared great losses and bankruptcies. Merill Lynch, Morgan Stanley, Goldman Sachs and many other big financial institutions were recovered from bankruptcy at the last minute with the financial support of US government (Özatay, 2009). These huge losses and financial turbulence in US have spread to many regions of the world. The US government injected more than a trillion dollars into the market between 2007 and 2008. However, due to the strong financial and commercial links between countries, the mortgage crisis has ceased to be US-oriented and has forced other countries into an economically challenging process.

2.2.4.2. 2009-2010 EU Debt Crisis and Sovereign CDSs

Analyzing the reasons of the EU's debt crisis, many banks that had the US's mortgage backed securities in their portfolio suffered from material losses due to bankruptcies and defaults in the US. Besides, the shortage of liquidity in the financial markets has laid the ground for deepening the crisis. On the other hand, the imbalance between banks' assets and liabilities has made it difficult for firms and consumers to borrow, which has led to sharp drops in total demand. Due to the recession in the USA, foreign trade has contracted in the EU and the export-import balance of trade partners has deteriorated.

The other impact of the mortgage crisis was the decline in stock prices in global markets. Therefore, the US mortgage crisis has become global in the following periods and deeply influenced other countries. During these periods, some EU countries experienced difficulties in sustainability of the public debt.

The debt crisis led by Greece, Ireland, Portugal, Spain and Italy between the years 2009-2010 has continued due to the effects of various links between the countries. Growth rates in Eurozone decreased and interbank liquidity flow slowed down. Countries such as Greece, Ireland and Portugal have requested financial support and financial assistance from Troika, which was formed by the IMF, the European Central Bank and the European Commission. Troika asked to reduce public debt from Greece to 2020 and to reduce the ratio of this debt to GDP from 157 to 124 percent. For this purpose, Greece has faced serious financial reforms and regulations. On the other hand, central banks reduced interest rates and displayed a supportive attitude towards reducing the debt costs of banks, in the crisis period. Unlike Greece, Portugal and Ireland completed the financial improvement processes imposed by Troika in 2013 and 2014. On the other hand, Greece has been subject to rescue packages in various time periods since 2010, in 2012 it has become unable to pay its debt in terms of public sector bonds and has gone into debt restructuring

CHAPTER 3

FACTORS AFFECTING SOVEREIGN CREDIT RATINGS AND CREDIT DEFAULT SWAPS

3.1. EVOLUTION OF SOVEREIGN RATING MODELS

The concept of country risk (sovereign risk), which determines the sovereign credit rating, refers to the volatility of the revenues from an individual country due to many factors. This concept was created to identify and calculate the losses of banks in international transactions in the 1960s. In previous periods, the so-called transfer risk which is the possibility of governments to impose limits on foreign payments, has been transformed into a wider concept, country risk, which includes the inability to meet the external debt obligations of countries (Riberio, 2001: 9).

Thanks to technological developments, increasing export volumes, access to new markets and investment opportunities led trade to an international dimension with accelerated globalization. On the other hand, in addition to own country companies or government agencies, investors have started to invest in other countries through stock markets, portfolio investments and direct investment channels. This continued until the mid-1970s without major problems. Investors increased their profits by entering new markets and while countries supported their economic growth through foreign investments. With the Bretton Woods system becoming nonfunctional in 1971, countries have greatly increased their money supply and the liquidity abundance has started to emerge in the markets. This abundance created a very attractive situation in terms of the borrowing of developing countries in need of external financing.

With the OPEC (Organization of Petroleum Exporting Countries) crisis, which started in 1973, the four-fold increase in oil prices, the financial distress and the

collapse of the stock markets led to the end of the global liquidity abundance. This led to the debt crisis of countries like Poland, Mexico and Brazil in the 1980s. For this reason, many international banks and hence many investors and stockholders have suffered great losses. In this period, the top ten banks in the United States have taken serious measures to compensate for the damages and to correct their losses in their investments in Latin America. (Ribeiro, 2001: 3).

While the credit ratings were mostly on the bonds issued by the private sector organizations and state-owned enterprises until the 1980s, the sovereign credit rating concept started to come to the fore after these developments. In the following periods, international financial institutions and CRAs began to focus more on the concept of country risk and to develop new methods for country risk measurement. Financial institutions which focused mainly on market diversification and hedging techniques in previous periods, started to focus on more specific and detailed (economic, financial, political) risk measurement techniques to measure country risk. CRAs and some large investment banks have created their own country risk models and renewed these models according to the conditions of time.

3.2. METHODOLOGIES OF THREE BIGGEST RATING AGENCIES

3.2.1. S&P's Sovereign Credit Rating Methodology

S&P updates country rating criteria in accordance with the world conjuncture and developments from time to time and shares these updates with the public. On 18 December 2017, S&P issued its latest update to the sovereign rating methodology. According to this guide named "Ratings Direct", S&P   determines sovereign rating based on several factors under five main criteria (Figure 8).
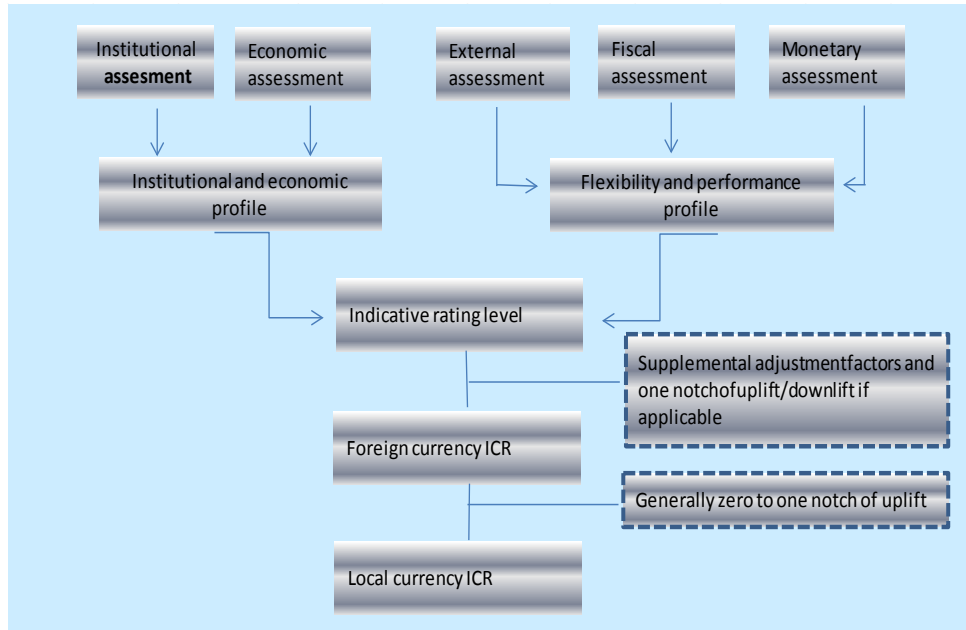
Figure 8: Credit rating framework of S&P

Source: S&P Ratings Direct, 2017

S&P's analysts determine the indicative sovereign credit ratings with their credit rating model developed by them. After the calculations of analysts, the foreign currency indicator credit rating is obtained by taking into account the adaptation factors. Considering the special circumstances and prospective expectations of the country, this indicator may be subject to change. For example, public investments have a negative effect on public finances in the current period. On the other hand, it is thought that this negative effect will disappear in the following period considering the investments encouraging growth in middle and long term and generating income. In this context, S&P takes into account the effects of non-permanent social and economic developments with its adaptation factors in line with the prospective expectations.

3.2.1.1. Institutional Assessment

The concept of institutional assessment is defined as the general success of institutions in ensuring sustainable public finance, steady economic growth and resistance to economic and political turmoil. There are four different evaluation criteria under this concept.

3.2.1.1.1 Stability, Effectiveness, and Predictability

The following points are taken into account under this heading.

- The ability of the country's institutional structure to overcome the political, economic and financial crises in the past and to achieve a balanced growth to ensure that countries take the correct measures to overcome the imbalances in economic cycles.

- The existence of sound and stable institutions that limits the uncertainties by ensuring stability in fundamental policy issues, even in the situation of a change of political power.

- Actual or potential resistance to the institutions and the institutions experiencing legitimacy problems due to ethnic, religious or political reasons cause significant changes in the credit rating by increasing the risks of corporate stability.

- Social inclusion, social mobility, social order and the capacity of political institutions to respond to social priorities reduce the political risks and increase corporate stability and affect the country rating positively.

3.2.1.1.2 Accountability and Transparency of Institutions and Accurate Data Generation

The following points are taken into account under this heading.

- The existence of inter-agency control mechanism prevents the possible corruption by preventing the institutional deviations in the country and ensures the continuity of the policies by preventing the institution overruns.

- The high level of corruption perception in the country adversely affects the country rating by increasing the risk perception for both investors and borrowers.

- The unbiased implication of laws and rules and the accountability of the administration constitute an environment of legal trust for investors and borrowers.

- The independence of the statistical institutions and the media ensures that the economic and political developments in the country are evaluated correctly by the international investors and increase the perception of trust in the country.

3.2.1.1.3 Debt payment culture of the Sovereign

The following points are taken into account under this heading.

- Significant amounts and long-term accumulated debt stock reveal the reluctance of countries to pay debt and affect their credit rating negatively.

- The questioning of the legitimacy of the borrowing in previous periods reduces the country's willingness to pay its debts.

- The fact that the country has not gone through a policy change after its default situation has led to the perception that new default situations may occur in the national and international public opinion and lead to a decrease in the credibility of the country.

3.2.1.1.4 External Security Risk

In S&P analysis, the negative relations of countries with the outside world, especially with their neighbors, affect national security, which indirectly affects political stability, fiscal discipline, investment level and balance of payments. If the country's tension with another country continues for a long time and does not have the possibility of war, this situation affects the credit rating through its institutional and management capacity. However, if the tension experienced in a short period of time and has a risk of war, it directly affects the country credit rating.

3.2.1.2. Economic Assessment

Economies with diversified, flexible, rich, market-oriented and stable growth experience provide countries with a strong tax base, monetary and financial flexibility, and thus high debt payment capacity. As the countries approach these

conditions, their credit ratings increase. The main determinants of the economic performance part of the country credit rating are; income level, growth expectation, economic diversity and stability.

3.2.1.2.1   Income Level

National income per capita is used as a measure of income level. It is stated that the increase in per capita income makes it possible for countries to have a wider supply of funds depending on higher tax potential and increasing household savings. According to the S&P analysis, the fact that the real economic growth is not in a stable structure also destabilizes the financial structure and financial situation of the country and adversely affects the country's debt payment capacity.

3.2.1.2.2   Economic growth expectations

S&P states that countries should have a sustainable growth rate close to their potential growth to maintain or increase their per capita income levels. Therefore, having a stable and sustainable growth rate in the past and reflecting this in the future is one of the most important elements of economic assessment while determining the sovereign credit rating.

3.2.1.2.3   Economic diversity and Stability

According to the S&P analysis, countries which cannot provide economic diversity and intensify their production structure in one or more areas are affected much more by the problems that may occur in these areas than the countries that have diversified their economies. In addition, large economic losses may occur in the economies where production structure is dependent on natural conditions such as flood, disaster, drought etc. and the income levels of these countries are volatile according to natural conditions.

3.2.1.3. External Assessment

According to S&P, the success of a country in its external financial relations refers to the capacity of that country to translate its foreign debts and, if necessary, to meet its liabilities to non-resident real and legal persons. The diplomacy in external economic relations affects the country's exchange rate, investors' opinion, competitiveness and thus the purchasing and payment power of the country. S & P evaluates the country's external financial relations under three main headings:

3.2.1.3.1 External liquidity and external debt

Gross external financing needs of countries are used as external liquidity indicators. The need for external financing is determined by the balance of payments and historical debt stock of countries. countries with trade deficit and high external debt stock have high foreign financing needs.

The need for external financing is a risk factor for countries and negatively impacts the credit rating. The high level of international reserve assets is seen as a factor reducing the external financing need and financing risk. On the other hand, countries with deep foreign exchange market due to floating exchange rate regime do not usually have much international reserves in central banks since individual debt crises do not affect exchange rates.

3.2.1.3.2 The Status of the Currency in International Transactions

The fact that the country's currency is frequently used in international transactions indicates the confidence in the currency of that country. Also, the currencies used frequently and in large amounts are less sensitive to international investment shifts. This is even more evident for the currencies used as reserve money. Reserve currencies are much less fragile than other currencies against economic and financial shocks. In addition, the use of the country's currency as reserve money indicates the

reliability of the country's policies and institutions, the strength of its financial systems, and the country's large and open capital market.
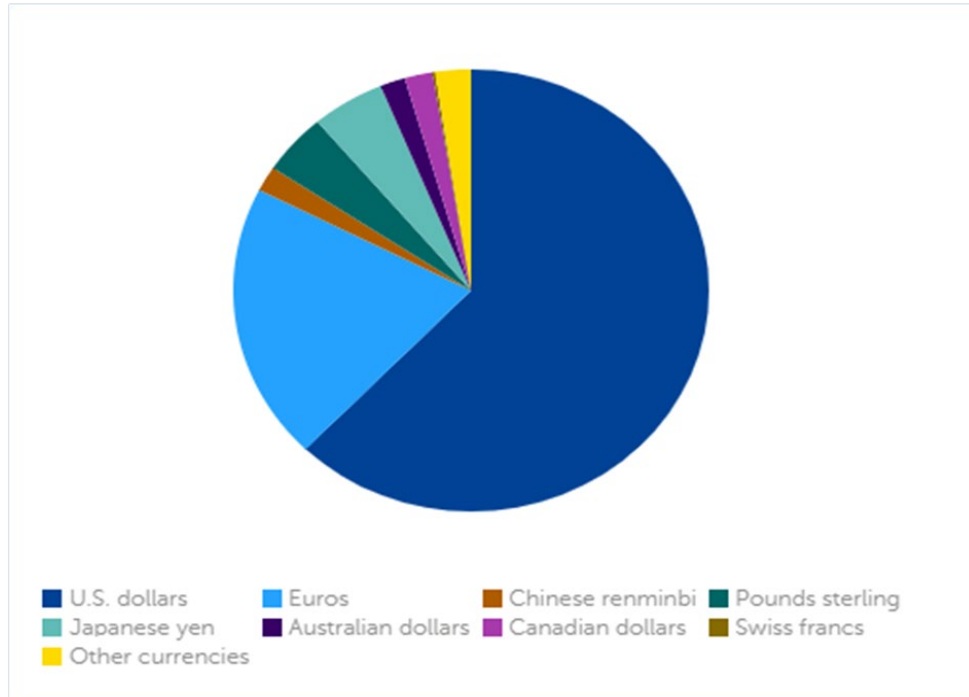
Figure 9: World Allocated Reserves by Currency

Source: IMF Data, COFER (2018)

3.2.1.3.3   Membership in monetary unions

In addition to their external liquidity and balance of payments status, being a member of a common monetary union brings additional note increase depending on the status of the currency they are a member of. According to the S&P analysis, the currencies of the countries that use the common currency are more stable and the individual problems of the countries are not reflected in the currency and the exchange rate stability is more easily achieved and the exchange rate risk on the credit rating decreases.

3.2.1.3.4   Official Funding

International assistance received by countries is one of the other issues affecting the credit ratings given by S&P. In the economic contraction periods, countries moving

towards international programs such as IMF programs can accelerate the crisis exit process with economic and technical assistance. Along with the technical support provided for making political decisions that should be applied in the process of exit from the crisis, meeting some of the financing needs with cheap credit facilities can reduce the economic risk of countries. On the other hand, since program implementations may cause reactions within the country, political support for governments may be diminished and programs may fail.

3.2.1.3.5   External Data Limit

Another determinant of the sovereign credit ratings of S&P is the shortcomings and inconsistencies in the countries' data. In particular, the lack of data in external accounts creates problems in determining the country's external financing needs and payment capacity. Therefore, the uncertainty situation caused negative adaptations in the ratings.

3.2.1.4.   Financial Assessment

3.2.1.4.1   Fiscal performance and flexibility

One of the factors determining the credit ratings of S&P is the ratio of the general government borrowing requirement to gross domestic product. This high rate affects the country grade negatively. Borrowing needs that arise when public expenditures are more than their incomes, in other words, the budget deficit increases the country's debt burden and interest payments.

Another issue affecting credit rating is financial flexibility. According to S&P, financial flexibility refers to the capacity to re-establish the financial balance in economic crisis periods or in a shock to the economy. In order to have financial flexibility, there are two important conditions listed below.

- Countries should have the capacity to increase government revenues in a short time with tax and income policies implemented during crisis periods. To

achieve this, an economic structure with a large tax base and low informality rate is required. Income policies applied in economies with low tax payments and high informality rates do not yield the desired results. Governments that want to increase their income in the economies with this structure tend to increase the current taxpayers' burdens. This causes social and political turmoil and negatively affects the credibility of governments.

- Another condition for achieving fiscal flexibility is the ability to reduce government expenditures by reducing public spending in times of crisis. In addition to current expenditures for public services, countries that need a high proportion of infrastructure investments do not perform well in reducing expenditures. The decrease in public investments and the reduction or cessation of long-term public service expenditures creates a pressure on the government as it causes a loss of votes. In addition, increasing social security and health expenditures due to the aging of the population is one of the biggest obstacles to public spending cuts. The increase in the average age of the population and the decrease in the share of the working age population in the total population have a negative effect on the government revenues by causing a decrease in the contribution to social security and pension funds. On the other hand, it leads to an increase in health and pensions expenditures. This situation has a significant negative impact on budget flexibility.

3.2.1.4.2   Debt Burden

The most important financial factor effecting sovereign credit ratings of S&P is the country's debt burden. The high debt burden means that the country allocates a significant portion of its income to interest payments. Moreover, the high debt burden makes it difficult to cover the debts with the decrease in government revenues in times of economic crisis. The debt burden level is mainly determined by two main elements.

- The ratio of general government interest expenditures to revenues, in a sense, indicates the capacity of countries to pay their debts. At the same time, the high

rate of interest expenditures to revenues reduces the rate of return of collected taxes as a service and causes social dissatisfaction. In addition, the lack of public investments to stimulate economic growth due to the high share of interest payments creates a spiral, leading to the loss of income for the country.

- The high ratio of the general government net debt stock to the gross domestic product causes the allocation of a significant portion of national resources and national income as interest payments. Moreover, in countries with high debt stock, the decline in revenues in the periods of economic downturn also makes it difficult to pay the high amount of interest created by the debt stock. This raises the risk of default and increases the risk of the country. On the other hand, the specific structures of the countries can reduce the risk of the debt burden. Debt burden may not be seen as a major risk perception for countries with advanced capital markets with financial flexibility. The robustness of the country's debt payment history, the potential for economic growth and the deep capital market ensure the sustainability of high debt stock. In addition, the maturity structure of the liabilities improves sustainability and reduces the risk perception.

3.2.1.5. Monetary Assessment

In determining the country's credit rating, the S&P also takes into account the country's monetary situation and the ability of monetary authorities to overcome economic and financial shocks, as well as support for sustainable economic growth. Monetary authorities have an important tool as monetary policy, to stabilize economic growth, downward and upward fluctuations, and make them stable at the potential level. In this context, monetary policy affects the country rating in two ways:

3.2.1.5.1 Ability to activate monetary policy and use the exchange rate regime

S&P states that monetary policy can be used to control economic and financial transactions in local currency in order to eliminate imbalances in the economy. There is a close connection between the success of monetary policy and the exchange rate

regime. Any change in monetary policy leads to different results on the economy with respect to the exchange rate regime, primary and secondary effects on foreign trade and national income. The effectiveness of the monetary policy, which is zero in the fixed exchange rate system, increases according to the degree of freedom of exchange rate. S&P defines the countries that use currencies as reserve money as the most advantageous countries in terms of the effectiveness of monetary policy.

3.2.1.5.2   Credibility and effectiveness of monetary policy and inflation trends

According to S&P, the level of development of capital markets and financial system is a very important factor in terms of monetary flexibility, which enables monetary policy decisions to be reflected in real economy. Monetary policy tools affect the borrowing costs of households and the business world and direct the real economy. In addition, with the various products offered by the advanced capital markets, households' tendency to save increases throughout the country.

In order for monetary policy decisions to be effective, the credibility of the monetary authorities must be in place. According to S&P, the central bank needs legal, managerial and operational independence as decision-makers in order to ensure credibility. In addition to the legal independence, the independence of the central bank administration and the budget is very important for the managers to take the most appropriate policy decisions and to protect them from the political pressures during the implementation of the decisions with the appropriate policy instruments.

The indicator of the effectiveness of monetary policy is price stability and low inflation rate. The price instability and high inflation rate not only affect the trade with the real exchange rate, but also cause the local currency not to be a means of saving and prevent the deepening of financial markets. The implementation of effective monetary policy contributes to the creation of an atmosphere of confidence across markets and the economy.

Table 12: Main Factors taken into account by S&P in credit ratings

Economic and Monetary Indicators	
GDP per Capita	Current Prices (USD)
Per Capita Income Growth	Percentage Change
CPI	Percentage Change
Debt Obligations	Percentage Change
Monetary Base	Total amount of money in circulation, bank cash reserves and reserve requirements
External Finance	
Current account revenues	Current Prices (USD)
Exchange reserves	Current Prices (USD)
Gross external finance needs	Share in current account balance and total reserves
Net external Debt	Share in Current account revenues
Current Account Balance	Share in Current account revenues
Net FDI	Share in GDP
Net External Obligations	Share in Current account revenues
Terms of trade	Percentage share
Financial Indicators	
General Government Debt Stok	Share in GDP
Liquid financial assets	3 years Average of CAB + Net FDI to GDP
General Government Interests Payments	Ratio to General Government Revenues
External Interest Payments	3 years average of Ratio to Current account revenues
International Official Reserves	International reserve stock as guarantee for monthly import payments

Source: S&P 2017

3.2.2. Moody's Sovereign Rating Methodology

Moody's published a guideline on rating methodology, which was last updated on December 22, 2016, how it determines the sovereign credit ratings. According to the latest published guide, Moody's gives credit ratings based on four main factors: economic, institutional power, fiscal power and sensitivity to crises (Figure 10).

Moody's also establishes credit ratings based on certain economic, social and financial indicators as S&P and periodically updates its methods by taking into account the structural changes experienced in the world economy.
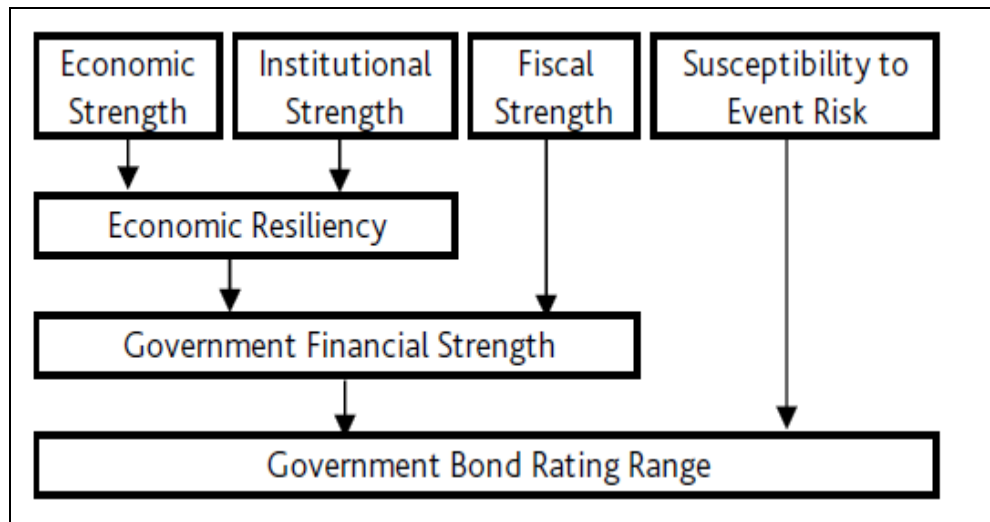
Figure 10: Main factors in sovereign credit ratings of Moody's

Source: Moody's, 2016

3.2.2.1. Economic Strength

The benchmark, which was first assessed by Moody's, is the economic power that refers to economic diversity, competitiveness, national income and size. Economic power determines the country's revenue generation and debt repayment capacity in the short and medium term.

Economic weakness is the main reason for the experienced defaults in the past. According to the analysis of Moody's, the majority of past delays were caused by long-term economic recessions. Moreover, the debt burden could not be sustained due to the loss of income caused by the economic downturns. Economic power is evaluated under three main headings;

- **Growth Dynamics:** Countries with long-term low growth rates have problems related to the sustainability of their debts. Therefore, to measure the economic growth dynamics which is the most important

indicator of the sustainability of debt; past and medium term growth rates, the imbalance of the real growth rate in the past period and the competitiveness of the economy are examined.

- **The size of the economy:** The economic size increases the resilience against the cyclical fluctuations. Rich but small-scale economies are highly sensitive to external shocks, while large-scale and diversified economies have a more stable growth structure and revenue generation capacity.

- **National income:** Economies with high per capita income have a high debt payment capacity. The high per capita national income increases the solvency and reduces the need for external financing.

3.2.2.2. Institutional Strength

Institutional Strength is defined as the capability of sovereigns' to create robust policy frameworks to support growth and raise welfare. In addition, the credibility of the central bank, the credit history of governments are important elements in terms of institutional power. While the regime of countries does not play a decisive role in the credit rating, the rule of law, transparency, and deep-rooted democracies have high-level ratings. There are two basic elements that determine the institutional strength

3.2.2.2.1 Institutional Framework and Effectiveness

- **The effectiveness of the government:** The management quality of the political structure and bureaucracy, as well as the ability to plan and implement, the provision of budgetary discipline are important subjective determinants of institutional activity.

- **The rule of law:** The binding of contracts, the property rights, the independence and the reliability of the legal system are considered as preconditions for the establishment of an environment of trust.

- **Control of corruption:** The use of public power for private interests, the fact that the economy is in the hands of a number of elites, bureaucracy and interest groups, are the main reasons that increase the risk factors. In addition, accountability and lack of transparency are other important issues that increase the country's risk.

3.2.2.2.2 Policy Credibility and effectiveness

Inflation performance: Inflation is the most important indicator of the credibility and effectiveness of policies. Without price stability, it is not possible to achieve a sustainable economic growth rate and maintain competitiveness. High inflation rate decreases the confidence in the local currency and thus prevents the local money to be a tool for saving.

Unstable inflation gives also negative signals about the institutional strength of central banks. The volatility in inflation points to the uncertainty of the monetary policy and the inadequacy of central banks in controlling inflation. Moreover, the ability of central banks to intervene in financial crises is an important factor that reduces country risk. Low interest rates help central banks and provide policy flexibility. Therefore, the credibility of the central banks and monetary authorities plays a key role in financial and economic stability.

3.2.2.2.3 Fiscal Strength

Financial strength is defined as the health of public finance in general. Financial strength is examined under the sub-headings of public sector's debt burden and debt affordability.

- **Debt burden:** Although the debt amount of countries seems important, the main factor that constitutes a risk factor for the country is the ratio of the general government debt to gross domestic product. Each high debt ratio does not lead to default, but is accepted as the starting point of defaults. In addition, the ratio of debt to GDP gives important information about the country's capacity to pay its

debt. This high rate indicates the country's financial insufficiency and creates pressure on the budget and thus on the taxpayers.

- **Debt Affordability:** In order to realize the repayments of the debt burden on time and in full, the income generation capacity of the countries should be sufficient. The first indicator of this adequacy is the ratio of general government interest payments to revenues. The high level of this ratio causes the budget deficit to be triggered as well as the limited amount of public investments, resulting in a negative impact on long-term economic growth. Another factor indicating the debt affordability is the ratio of general government interest payments to GDP. The low rate of public finance shows the country's rapid revenue generation capacity in the short term and the capacity to increase its national income and production to meet the country's debt obligations in the long run with new investments.

3.2.2.2.4 Susceptibility to event risk

Unlike the other medium-term factors mentioned above, under this heading the resilience of countries against sudden shocks is evaluated in three main areas.

- **Political risk:** Countries may experience local unrest due to political and economic reasons, depending on the transparency and accountability of governments in public services, the degree of freedom of expression of citizens and the press, and the per capita income level of the population. In addition, countries may also carry geopolitical risk factors due to regional problems. Both local and regional risk factors have a negative impact on the credit rating. For example, while the political turmoil and administrative instability in the Middle East and North Africa influence the countries' local political risks and negatively effecting credit ratings, South Korea's constant threat to North Korea poses a geopolitical risk for South Korea prevents its ratings to increase.

- **Liquidity Risk:** Liquidity risk refers to lack of government funding to pay for debts in general. When other conditions are kept constant, countries that have a diversified, deep and large pool of financing are more advantageous than those in which the financial system is undeveloped and domestic savings are low. The

strength, scale and financing structure of the banking sector are the other important factors affecting the liquidity risk of the countries.

- **External vulnerability risks**: Countries that have a deficit or a net capital outflow in foreign trade, have difficulties in foreign currency payments. As a reflection of this situation, the depreciation of the exchange rate and the decrease in international reserves occur.

Table 13: Sub-factors Moody's use in their analysis

Broad Rating Factors	Rating Sub-Factor	Sub-factor Weighting (towards Factor)	Sub-Factor Indicators
Factor 1: Economic Strength	Growth Dynamics	50%	Average Real GDP Growth t-4 to t+5
			Volatility in Real GDP Growth t-9 to t
			WEF Global Competitiveness Index+D4:D35DD4:D35
	Scale of the Economy	25%	Nominal GDP (US$) t
	National Income	25%	GDP per capita (PPP, $US) t
	Adjustments to Factor Score	0 - 6 scores	Credit Boom
			Other
Factor 2: Institutional Strength	Institutional Framework and Effectiveness	75%	Worldwide Government Effectiveness Index
			Worldwide Rule of Law Index
			Worldwide Control of Corruption Index
	Policy Credibility and Effectiveness	25%	Inflation Level t-4 to t+5
			Inflation Volatility t-9 to t
	Adjustments to Factor Score	0 - 6 scores	Track Record of Default
			Other
Factor 3: Fiscal Strength	Debt Burden	50%	General Government Debt/GDP t
			General Government Debt/Revenues t
	Debt Affordability	50%	General Government Interest Payments/Revenue t
			General Government Interest Payments/GDP t
	Adjustments to Factor Score	0 - 6 scores	Debt Trend t-4 to t+1
			General Government Foreign Currency Debt/General Government Debt t
			Other Public Sector Debt/GDP
			Public Sector Financial Assets or Sovereign Wealth Funds/ General Government Debt t
Factor 4: Susceptibility to Event Risk	Political Risk	Max. Function2	Domestic Political Risk
			Geopolitical Risk
	Government Liquidity Risk	Max. Function2	Fundamental Metrics
			Market Funding Stress
	Banking Sector Risk	Max. Function2	Strength of Banking System
			Size of Banking System
			Funding Vulnerabilities
	External Vulnerability Risk	Max. Function2	(Current Account Balance+FDI)/GDP t
			External Vulnerability Indicator (EVI) t+2
			Net International Investment Position/GDP t

Source: Moody's Rating Methodology, 2016

3.2.3. Fitch Ratings Sovereign Credit Rating Methodology

In determining the country credit rating, Fitch Ratings states that various qualitative and quantitative assessments are used to measure willingness and capability, which are substantial terms for sovereigns to meet their liabilities. In this context, Fitch Ratings determine the sovereign credit ratings according to the below titles;

- Macroeconomic performance and forecasts,
- Political and structural risks by external shocks,
- Risks against stability in macroeconomic and financial conditions,
- External financing regarding the sustainability of foreign trade and CAB capital flows and foreign debt.

3.2.4. Macroeconomic policies and performance

The public sector is considered to be fundamental actor by Fitch Ratings as it affects macroeconomic performance and stability. The establishment of reliable policy frameworks and the implementation of sound monetary and fiscal policies are seen as the most important factors in achieving sustainable growth and economic stability.

Macroeconomic fluctuations reduce the resistance of countries to shocks, as they limit savings and investments, hinder the development of the financial sector and hinder long-term investment decisions. Fitch Ratings uses the standard errors of annual increases in GDP, CPI and real exchange rate for the last decade to measure macroeconomic fluctuations.

3.2.4.1. Structural Features

Fitch Ratings does not regard macroeconomic stability as the sole determinant of country risk but also takes into account the structural dynamics and political risks of the economy.

Shock-resistant economies are generally economies that have high savings rates, are open to trade and capable of directing their resources to the right areas through international capital flows with effective legal and institutional mechanisms. In this context, Fitch Ratings, determine the relative superiorities and weaknesses of the business environment, the status of human capital and general management capacity, with United Nations Human Development Index, The World Bank Ease of Doing Business Index and World Wide Governance Indicators. Moreover, the national income per capita is considered to be an important variable in explaining the productivity and the high added value of the labor force and the human and physical capital of the economy.

The concept of political risk shows the course of countries' willingness to use their political capacity and resources to pay their debts. While the high level of consensus on economic and social policies across the country increases the applicability of policies, inequality in income distribution, religion, race and regional differences are factors that have a negative impact on the country credit rating. Fitch Ratings uses the World Bank's World Governance Indicators (the rule of law, government effectiveness, and control of corruption, political stability and accountability) to measure the country's political situation and management capacity. In addition, relations with IMF and international development banks and debt payment histories are among the factors positively affecting the sovereign rating.

One of the essential economic indicators affecting the sovereign risk is the status of the banking sector. How the savings are evaluated and how the investments are financed are important in terms of macroeconomic stability of the country. Strong banking sector structure and effective financial market regulation of government and central banks and the ability to effectively intervene in crisis situations increase the stability of the financial sector. Fitch Ratings evaluates the status of the banking sector with the Fitch Bank Systemic Risk indicator.

3.2.4.2. Public Finance

Public financial management significantly affects national economies through taxation, expenditure and borrowing channels. While weak fiscal policies lead to macroeconomic imbalances and even crises, high and growing public debts increase the country's interest payments and reduce its resilience to crises. This situation adversely affects the sustainability of the country's debt management.

Fitch Ratings recognizes public gross and net debt stock as the main indicator when measuring the financial position of countries. Evaluating this data, the maturity length of debts is considered as an important criterion. Long-term public debt increases the country's debt sustainability and reduces fragility against financial shocks. Internal and external composition of debt stock is another factor affecting the debt management of countries. The high domestic debt ratio in the current debt stock gives flexibility to debt management in countries.

3.2.4.3. External Finance

In order to fulfill their external obligations, countries have to obtain foreign exchange income through export of goods and services, foreign asset revenues or asset sales. The balance of payments statistics is considered to be the basic source of information on the sovereigns' external financing condition. Countries that have not diversified their exports are more sensitive to external shocks and terms of trade and have higher risks. A high level of current account deficit and its short-term and unstable external financing is one of the important factors that increase the country's risk. Moreover, as the high external debt stock leads to high capital and interest payments, it increases the foreign currency need of the country and causes external fragility.

One of the most important points in the evaluation criteria of Fitch Ratings is that per capita income which is considered as economic factor in S&P and Moody's evaluations, is taken as a structural factor in Fitch Ratings' analysis. Fitch Ratings considers per capita income as an important variable in explaining the structural

features such as labor productivity, high value-added production structure and the human and physical capital of the economy.

Table 14: Fitch Ratings Qualitative Factors for Sovereign Credit Ratings

Variable	Definition	Final Notching
Structural features	1.Political stability and capacity	
	2.Financial sector risks	
	3. Business environment and economic flexibility3.	
	Exceptionally strong relative to rating category peers	2
	Strong relative to rating category peers	1
	Average relative to rating category peers	0
	Weak relative to rating category peers	-1
	Exceptionally weak relative to rating category peers	-2
Macroeconomic Features	1.Macroeconomic policy credibility & flexibility	
	2.GDP growth outlook	
	3.Macroeconomic stability	
	Exceptionally strong relative to rating category peers	2
	Strong relative to rating category peers	1
	Average relative to rating category peers	0
	Weak relative to rating category peers	-1
	Exceptionally weak relative to rating category peers	-2
Public finances	1.Fiscal financing flexibility	
	2.Public debt sustainability	
	3.Fiscal structure	
	Exceptionally strong relative to rating category peers	
	Strong relative to rating category peers	2
	Average relative to rating category peers	1
	Weak relative to rating category peers	0
	Exceptionally weak relative to rating category peers	-1
External finances	1.External financing flexibility	-2
	2.External debt sustainability	
	3.Vulnerability to shocks	
	Exceptionally strong relative to rating category peers	2
	Strong relative to rating category peers	1
	Average relative to rating category peers	0
	Weak relative to rating category peers	-1
	Exceptionally weak relative to rating category peers	-2

Source: Fitch Ratings Sovereign Rating Criteria (2018)

Table 15: Fitch Sovereign Average Cumulative Default Rates (1995 – 2014)

(%)	Year One	Year Two	Year Three	Year Four	Year Five	Year Ten
AAA	-	-	-	-	-	-
AA+	-	-	-	-	-	-
AA	-	-	-	-	-	-
AA-	-	-	-	-	-	-
A+	-	-	-	-	-	6.25
A	-	-	-	1.52	3.33	7.41
A-	-	-	-	-	-	-
BBB+	-	-	1.96	2.04	2.17	-
BBB	-	-	-	-	-	-
BBB-	-	1.89	3.16	4.82	5.63	11.9
BB+	1.72	2.73	2.94	3.19	3.53	10.2
BB	1.45	2.9	4.41	5.97	6.35	9.52
BB-	-	-	-	-	-	-
B+	-	-	1.2	2.7	3.13	-
B	1.01	3.33	4.88	6.94	6.45	10.71
B-	1.61	6.9	8.93	9.26	9.62	12.5
CCC to C	26.09	28.57	26.32	22.22	27.78	36.36
Investment	-	0.21	0.46	0.74	0.94	1.78
Speculative	1.88	3.31	4.17	4.97	5.44	8.72
All Sovereig	0.69	1.35	1.81	2.28	2.56	4.05

Source: Fitch Ratings, 2015

3.2.5. Assessment of Grading Systems of Credit Rating Agencies

When S&P, Moody's and Fitch Ratings are compared according to their sovereign credit rating methodologies, it is seen that these three organizations determine their ratings in the light of similar indicators. The economic factors that are considered by the CRAs while determining credit ratings are; high national income per capita, stable growth structure, sound and sustainable public finance, sustainable external financing and solidity of the country's monetary policy. On the other hand, three CRAs attach importance to issues such as rule of law, governance efficiency, transparency and political predictability. Moreover, the fact that the currencies of the countries are strong and stable and that countries have a clean history of debt payment are among the other issues that the CRAs give importance.

3.3. LITERATURE ON DETERMINANTS OF SOVEREIGN CDS AND CREDIT RATINGS

In the literature, it is observed that academic studies on the relationship CDS premiums and country credit risk have been accelerated especially after 2008. In particular, the ratings given by CRAs which lost its meaning during the financial crisis in 2008 and debt crisis which started in Europe in 2010 brought up the need for more meaningful criteria that could reflect the performance of the countries and companies in financial markets. The studies on the relationship between CDS premiums and country credit risk are briefly mentioned below.

Pan and Singleton (2008), have tried to identify the factors affecting the changes in CDS spreads of Mexico, Turkey and Korea which have different geopolitical characteristics and different credit ratings and CDS premium. The authors stated that risk appetite of investors has become more prominent on CDS in certain sub-periods (global liquidity periods) and that country-specific and regional political, macroeconomic and financial risks also affect CDS.

Remolona et al. (2008) analyzed the relationship between the monthly CDS premiums of 24 countries and the factors that have an effect on country risk by the regression analysis. They conclude that the inflation rate, the VIX (Volatility Index) index and the risk tolerance indicators such as RTI have an effect on the country risk and risk premium. The authors decompose the sovereign spreads as expected losses and risk premia. They state that the two items are effected by different factors. Expected losses is driven by market liquidity conditions and country specific risk factors, while risk premia is driven by global risk aversion in addition to sovereign risk itself.

Tang and Yan (2010) tried to measure the effect of changes in macroeconomic indicators on CDS premiums. They found a negative relationship between GDP growth and CDS premiums. On the other hand, they pointed out that volatility in GDP growth rate leads to increase in CDS spreads. The authors also state that CDS premiums decreased during the period when the investor risk appetite increased and systematic risk was low.

Scheicher and Fontana (2010) examined the relationship between weekly CDS premiums and the risk-free interest rate, investors' risk perception, external debt and iTraxx index, of the 10 countries (Austria, Belgium, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal and Spain) in the Euro Zone during the period January 2006 – September 2009. In their study which they take A+ and above government rating as risk free according to Basel II capital requirements, they have reached the conclusion that any decrease in investor risk appetite cause increase in CDS premiums. Also, they mention that some concerns such as migration risk and possibility of loss of AAA credit rating may cause jumps in CDS spreads.

Kaya et al. (2014) analyzed the response of credit ratings and CDS spreads to economic and social events in Turkey. Authors, using multiple linear regression method and the daily data, analyzed the period between the dates of 01.01.2007 and 22.04.2014 for Turkey. The authors state that, according to the results of the analysis, all events have a significant effect on the variables as expected regardless of whether they are good or bad, but that the dimensions of the impacts differ on CDSs and credit ratings. Evaluating political or economic events, it is seen that economic events are more effective on dependent variables than political events. Considering the sources of the events, it is determined that the good events originating from abroad are more effective on dependent variables than domestic based good events. The authors state that when an evaluation is made considering all events, the credit ratings contain the effects of more events than the CDS premiums.

Plank (2010) analyzed 5-year CDS premiums of six developing countries which are Turkey, Czech Republic, Russia, Poland, Romania and Hungary. Plank examined the

period of January 2001-December 2009 with foreign trade, international reserves and external debt data which are also used to determine sovereign credit ratings. The author tries to explain the country risk with macroeconomic variables gives insight to investors about the ability of these countries to pay their debts. He concludes that increasing exports and international reserves negatively effects the CDS spreads, while increase in imports and external debt lead a rise in spreads in the context of ability to pay. He states that the results of his model and the actual data have more than 65 percent correlation.

Longstaff et al. (2011) analyzed the credit risk of the country by using CDS data of 26 developing and developed countries such as Brazil, Bulgaria, Japan, Korea, Malaysia and Thailand for the period of October 2000 – January 2010. Following Pan and Singleton (2008), the authors decompose CDS into two main components which are risk premium and default risk. The results of the study show that both components of CDS spreads are closely related to global factors and global liquidity trends, however the link between global macroeconomic factors and default component is stronger. The authors state that the period of the study has excess global liquidity; therefore the risk premium component might not reflect the long term correlation of CDS spreads and risk factors in sovereign credit markets.

Sand (2012) studied determinants of credit default swaps by analyzing the 5-year CDS premiums of 16 Euro region countries in the period of 2007-2011. The author used current account deficit, risk-free interest rate, ratio of debt to GDP, real exchange rate, household debt to GDP and risk appetite ratio for the analysis. Sand (2012) states that these variables mostly explanatory for sovereign credit ratings but also for CDS spreads. The relationship between variables such as debt to GDP ratio, current account deficit and inflation rate are found to be positively related to CDS spreads. On the other hand, inflation, current account deficit to GDP ratio, risk appetite and real exchange rate have negative relations with CDS premiums. The author mentions that the reason that other factors which are expected but not proved to have significant impact on CDS may be the other variables that are not present in the study but have an effect on CDS spreads such as market liquidity.

Akkaya (2017) states in his study that during the Global Financial Crisis, the CDS premium has become one of the most widely used criteria in the measurement of credit risk in recent years, as there are some questions about credit ratings of popular CRAs such as S&P, Fitch and Moody's. Akkaya examined the internal factors affecting the Turkish bonds' CDS premiums for the 2010 - 2016 period and conclude that the relationship between macroeconomic indicators and CDS premium such as growth, inflation, unemployment, current account deficit is weak, unlike other studies. On the other hand, long-term relationship is determined between the CDS premiums and financial indicators such as real effective exchange rate, banking sector capital adequacy, non-performing loans / total loans and BIST 30 values.

Türk (2008) studied determinants of CDS spreads of 4 developing countries (Turkey, Brazil, Russia and Mexico) by extended Merton model. He used foreign currency reserves of the central banks and foreign currency denominated external debt for his study and observed that a high degree of correlation between the relevant variables. Accordingly, it is concluded that the increase of the reserves of the central banks and the decrease of the foreign debts results with a decrease in CDS premium of the countries examined in the study.

Brandorf, and Holmberg (2010), analyzed macroeconomic variables affecting the CDS spreads for Portugal, Italy, Greece, Spain and Ireland in the period 2004 - 2009 with quarterly data. During the examination of these five countries, Germany was included in the study as the benchmark country. In the study, the periods were divided into two: the first (2004-2007) as financially stable and the second as financial turmoil (2007-2009). For the first period, the variables were meaningless. In the study, CDS spreads were taken as dependent variables and macroeconomic variables such as growth rate of gross domestic product, inflation, unemployment and total debt variables taken into account for the analysis. According to results of the study, the most important determinant was the unemployment rate. In addition, the increase in government debt has also contributed to the increase in the CDS base points.

In their study, Liu and Morley (2012) investigated the relationship between CDS premiums and macroeconomic variables with daily CDS contract premiums for United States (for 2005-2010) and France (for 2008 – 2010) using Granger causality test. The results show that the variable having the most effect on CDS was exchange rate and the risk-free interest rate represented by 3-month LIBOR interest has a limited effect on CDS premiums.

Papaioannou (2011) examined the changes in Credit Default Swaps in September 2008 and October 2010 according to economic and market factors and short-term credit rating announcements. The study shows that CDS spreads are affected more from economic variables and market factors rather than country ratings. In other words, the short run change in CDS premiums are not sourced by the credit rating announcements, contrary to the general view that rating manipulations lead the increase in CDS spreads in the crisis periods. On the other hand, it is concluded that volatility in American markets and European CDS spread changes are the most effective factors affecting the CDS spread changes in Greece.

Güven (2008), who referred to as emerging markets in Argentina, Russia, Brazil, Thailand and Turkey, between 1997 and 2001 and looked at the pre-crisis estimate of the logistic regression method. Moreover, Güven investigated a causality analysis whether the crisis in a country triggered the crisis in another country and examined the relationship between the credit default swaps in the mentioned countries. In the modeling of the financial crisis, macroeconomic data such as current account deficit, international reserves, total external debt and economic stability were analyzed. As a result Granger- causality, it is revealed that Argentina can be a possible cause of the crisis in Mexico and Turkey just like Brazil in Peru and Mexico, Turkey in Peru and Russia and Russia in Turkey. Finally, when the causality relation between the CDS spreads of the countries is examined, it is concluded that the CDS premiums of the countries mutilate each other.

As mentioned in the previous chapters, the importance of credit rating agencies has increased and the number of studies on credit rating modeling has increased rapidly especially after 1990s.

One of the pioneer studies in the literature on credit rating is done by Suk Hun Lee (1993), who made the 9-year data set covering the years 1979-1987 of 40 countries that fall under the category of least developed countries. The study, which was based on the notes of Institutional Investors, analyzed the countries' repayment capacities and credit rating factors. In this study, per capita income growth, inflation, interest rates, per capita national income increase variance, debt to export ratio and the geographical location, high indebtedness and large indebtedness dummy variables used by Lee were significant. As a result of the study, Lee has concluded that the country credit ratings provided by Institutional Investors are a reasonable measure of the country's creditworthiness.

In their study, Cantor and Packer (1996) examined Moody's and S&P's credit ratings with the cross-sectional data of 27 developed and 22 developing countries for the year 1995. In their studies, national income, GDP growth, inflation, foreign trade balance and external debt to GDP ratio and two separate dummy variables: industrialized countries and countries with default status after 1970, were found significantly meaningful. The authors state that they cannot find a systematic relationship between the budget deficit and the credit rating and explain this situation with the connection between the budget deficit and the international capital flows. The authors emphasize that the grades given by credit rating agencies are in the form of macroeconomic summary of the countries and that the notes given by the institutions are highly correlated with each other. As a result of the study, Cantor and Packer noted that the rating changes made by credit rating agencies can be estimated at a considerable rate, except in unpredictable situations. However, especially for countries below the investable level, factors other than publicly available data should be taken into account which makes the credit rating agencies meaningful.

Nobel prized economists Joseph E. Stiglitz and Liu Ferri (1999) examined 6 developed and 11 developing countries' credit ratings based on the notes of Moody's for 1989-1998 period with panel data analysis method. In this study, they used per capita national income, GDP growth, inflation, short-term debts and current account balance to GDP and industrialized country dummy variable. The study concluded that the ratings given by Moody's before the crisis could not predict the crisis. In addition, the authors stated that the Moody's deepened the East Asian crisis with note cuts during the crisis and emphasized that CRAs should be more conservative in note changes. In other words, they should not over-react to economic developments and avoid large-scale note changes in a short time.

Afonso (2002) analyzed the country credit ratings of Standard & Poor's and Moody's with two different techniques. Using the smallest squares and pooled data methods for 29 developed and 52 developing countries in the 1998-2001 period, Afonso (2002) found that economic growth, per capita national income, inflation, external debt to export ratio variable and default history and being a developed country dummy variables are significant determinants of credit ratings.

Reinhart et al. (2003) examined the factors affecting the country credit rating of 53 countries in the period of 1979-2000 based on the credit ratings of the Institutional Investor. Unlike other studies, Reinhart et al. (2003) focused on historical factors affecting the credit rating. In the models they used; 12-month inflation rate which was over 40% after 1848, the time after the last restriction and restructuring, the average of the foreign trade deficit / GNP ratio of 1979-2000 and a dummy variable for high ranked countries. According to the results of the studies of the authors using the horizontal section and panel data methods;

- Debt risk can be explained with a high level of debt payment history, debt level and macroeconomic stability variables.
- Developed countries and developing countries, which have not experienced a default in their history, have much higher debt resilience than other developing countries.

Rowland and Torres (2004) examined the credit ratings of 16 countries for the period of 1987-2002 based on Institutional Investors. In their study, economic growth, the ratio of debt and reserves to GDP, the ratio of debt to export and the variables of inflation were found to be significant. They also concluded that the default dummy variable that they used also affected the credit rating.

In 2005, Rowland expanded its work with Torres both on a company and a country basis. Rowland has again studied for 29 countries, based on Moody's, Standard & Poor and Institutional Investor ratings. Unlike the previous study, Rowland identified per capita national income and economy openness variables as factors affecting credit rating. In addition, Rowland concluded that credit rating agencies take similar variables into account when calculating a country rating.

Sutton (2005) examined the factors determining credit ratings for 30 developing countries, using the averages of the grades given by Standard & Poor's and Moody organizations. Sutton, with the ordinary least squares (OLS) method, analyzed the sovereign credit rating by using the corruption index, international reserves, the ratio of international short-term debts of banks to long term debts, the ratio of external debt to exports, the ratio of external debt to GDP, the number of last year after the last default. He also used dummy variables for EU member states. As a result of the study, corruption index, the ratio of international short-term debt to long-term loans, the number of previous years after the last default and the ratio of external debt to exports were statistically significant. Sutton stated that although rating agencies have very complex evaluation systems and they contain many subjective variables, they can explain 87 percent of their credit ratings with these four variables that are statistically significant.

Mora (2006) re-examined the work of Stiglitz and Ferri (1999) by using credit rating averages of S&P and Moody's organizations. In the Mora's credit rating analysis which covers 88 countries and 1986-2001 period, per capita national income, economic growth, inflation, budget balance and payments variables and OECD-defined developed country dummy variable used. Mora supports some of the views

of Stiglitz and Ferri (1999) through the findings of the study and criticizes some of them. He found that, as Stiglitz and Ferri (1999), credit rating agencies are late in reducing the credit ratings of countries by acting conservatively in the pre-crisis period. However, according to Mora, credit rating agencies remain conservative in the pre-crisis and post-crisis period, but in correct periods of crisis, unlike Stiglitz and Ferri (1999).

After the global financial crisis that broke out in 2008, the number of publications in the credit rating field increased with the criticisms made against credit rating agencies.

Kalliomäki (2012), analyzed the country's credit ratings of Moody's for106 countries between 1983-2010 period. Kalliomäki used the panel data method as analysis method and examined the data separately according to the random effects and fixed effects models. Kalliomäki, which makes its analysis with GDP growth, GDP per capita, inflation and external debt to export ratio, finds that inflation is not statistically significant in contrast to previous studies. Although this situation may be a deficiency of its own model, he emphasizes the necessity to discuss whether inflation has a real impact or economic perception effect on the credit rating.

Afonso et al. (2009) examined the determinants of the country's credit rating based on two major rating agencies (S&P and Moody's), with data from 66 countries in the pre-crisis period (1996-2006). They used the variables of GDP, inflation, unemployment, general government debt ratio, external debt ratio, international reserves, current account deficit, government effectiveness, default history, and geographical position and European Union dummy variables. The authors, using panel data method, preferred sequential probit, sequential logit and random effects ordered probit models. They concluded that the most effective of the three models used were the random effects of the sequential probit model. The authors re-calculated their credit ratings with their rating model and compared their calculated country credit ratings with Moody's, and found that 45% were the same, 35% had a note error, and 15% had 2 note errors.

In order to determine the factors affecting the credit ratings of the CRAs and to measure the consistency of the grades given by these institutions, a few scientific studies were conducted in Turkey.

Gür (2001) tried to estimate the credit risk in a different method from previous studies. While other studies directly examined the impact of macroeconomic variables on credit worthiness, Gür (2001) first examined the effect of macroeconomic variables on the postponement rate of the country's debts (the ratio of deferred debt to total liabilities). Gür estimated the debt rescheduling ratio by using Tobit model and estimated the credit ratings of S&P's and Moody's organizations by using this ratio. Gür, who analyzed the 34 developing countries with 13 years of data covering the years 1986-1998 period, used the ratio of interest payments to exports, total debt stock, ratio of total debt to total debt, ratio of total debt to GDP, share of private sector debt in total debt and debt deferment ratio. In his study, Gür compared results obtained from the model he established with S&P and Moody's organizations with consistent results and concluded that it would be correct to use deferment rate, which is the indicator of the debt repayment capacity in determining country risk.

Teker et al. (2013) investigated the factors determining the credit ratings of the G-20 and PIGS countries which includes 13 developed and 10 developing countries in the period of 1998-2010, based on Fitch Ratings' ratings. They used; real GDP growth, per capita national income, inflation, ratio of public debt to GDP, ratio of budget balance to GDP, ratio of international reserves to GDP, ratio of FDI to GDP, ratio of portfolio investments to GDP, economic freedom index and the index of corruption perception for their analysis. Using the factor-based sequential probit model for panel data analysis, the authors state that each country has different economic structure and developed and developing countries implement different economic and fiscal policies after the global financial crisis erupted in 2008. Therefore thry indicate the necessity to use special indicators on a country-by-country basis and

different indicators for different country groups would be used in sovereign credit rating evaluation methods. According to authors, BRIC countries have different dynamics than other countries and China has different economic structure within BRIC countries. Moreover, it is stated that the countries which are the shipbuilder countries (Korea, China, Japan) have different grades compared to others. In addition, EU member states such as Germany, France and Italy had a different position among others due to their large gold reserves.

Balıkçıoğlu (2013) have examined the credit growth 12 countries for the 2000-2011 period (the US, Canada, Japan, Britain, Germany, France, Italy, Ireland, Spain, Portugal Greece and Turkey) based on the sovereign credit ratings of three major credit rating agency (Standard & Poor's, Fitch Ratings and Moody's). In her analysis she examined the impact of growth, inflation unemployment, current account deficit, public revenues, public expenditures, primary balance, credit to GDP ratio and budget balance on the country risk. Balıkçıoğlu tested objectivity and consistency of ratig given by CRAs by logit analysis method. Balikcioglu points out that fiscal policy variables, in particular public revenues, public expenditures and borrowing, are highly effective on the sovereign credit ratings. According to the results of the model she established; economic factors such as unemployment, growth, productivity and current account deficit, as structural factors are not so effective on the credit ratings. The author emphasized that CRAs give delayed reactions to country level indicators and stated that they were found to be objective in some cases.

Jacobs et al. (2010), examined the effect of the relationship between CDS premiums and rating grades on the pricing of credit risk and disclosure of market participants' perceptions. The results show that there are statistically significant differences between CDS spreads of the bonds which have similar the credit ratings. The observed differences could be partly explained by the loan quality as well as stock returns and short and long-term interest rates. Nevertheless, the results have shown that a significant portion of the differences between CDS premiums and credit ratings cannot be attributed only to variables related to the market or only the

reference asset. The authors conclude that credit ratings do not represent the real riskiness of a reference asset or entity and market value the risk before the rating agencies.

Ulusoy and Yılmaz (2017), compared the credit ratings and CDS premiums of developing countries at specific periods and looked for the justification of the criticism directed to the rating agencies. The authors analyzed the credit rating and CDS spreads of Russia, Brazil, Iraland, South Africa, Costa Rica, Thailand, Vietnam and Turkey in an historical perspective. In the study, it was observed that in some periods credit rating agencies give ratings to some countries which did not reflect the risk perception in the market and in some cases the same credit rating was given to countries with different risk perceptions. They conclude that CDS premiums are more independent and consistent in analyzing country markets and they have a more advantageous structure than credit ratings in terms of reflecting both the risk perception in the free market and the faster response to socioeconomic conditions.

Ismailescu and Kazemi (2010) examined the impact of credit rating announcements on the CDS premium of the country where the announcement took place and the extent of this announcement to CDS premiums of other emerging economies. In this respect, the standard event analysis method was used to determine how CDS markets reacted to the S&P credit rating and credit outlook announcements between 2001 and 2008. As a result of the research, it was determined that positive announcements had more effect on CDS markets during the 2 day period when the announcement was made and this effect spread to other developing countries. On the other hand, it has been determined that CDS markets can predict negative announcements and can be used to estimate the probability of a negative announcement of previous changes in CDS premiums.

Rıdriguze et al . (2018) extended the study of Ismailescu and Kazemi (2010), examining the relationship between sovereign ratings and CDS premiums in a different perspective by using 54 countries data for a ten years period. Although they have got similar results with the study of Ismailescu and Kazemi (2010), the authors

conclude that credit rating changes can be estimated by the CDS spread changes seven months before ,especially in negative rating changes. Also, they found that avarage of three years CDS spread variation can explain the sovereign credit rating changes.

Baltaci and Akyol (2016) examined the effects of macroeconomic variables on CDS premiums with panel data of 10 countries. They analyzed the effects of GDP growth rate, credit ratings, interest rates, unemployment rate, inflation rate, current account balance, stock market index and government debt on credit ratings with dynamic panel data generalized method of moments (GMM) method. They concluded that current account balance, GDP growth rate, real interest rate and stock market index have significant effect on CDS.

CHAPTER 4

ANALYSIS ON SOVEREIGN CREDIT RATINGS AND CDS PREMIUMS

In this study, in order to solve the problem of data deficiency due to limited time series and to make comparisons between the countries, it has been deemed appropriate to use the panel data method as analysis methodology, considering the studies in the related literature.

4.1. PANEL DATA

Panel data is created by combining data for individuals, firms or countries for a certain period of time. In other words, panel data is a combination of section analysis and time series. Gujarati (1999) defines panel data as monitoring of same section unit over time.

Panel data analysis combines time series with multiple cross sections. NxT data can be formed by the merging of N horizontal sections in the T time period. When the cross section is larger than the time dimension, the panel data is called horizontal cross-section, and when the time dimension is large, it is called time-dominant data (Stimson, 1985).

Using panel data analysis method can solve many problems in cross sections and time series. The advantages of panel data applications are listed below (Balestra, 1992; Baltagi, 1995; Gujarati, 2003):

- Firstly, the problem of violating the fundamental statistical assumptions that arise due to data restriction can be substantially eliminated by panel data analysis.
- Trying to explain the dependent variable with many variables with a limited number of observations affects the degree of freedom of the variables. Panel

data analysis also adds the time dimension to the cross-sectional data, thus eliminating this problem by increasing the number of observations.

- Throughout time, individuals, firms, and countries are related to each other, so there is a possibility of a heterogeneity in these units (Hsiao, 2003). Panel data estimation techniques can explicitly account for such heterogeneities by allowing some cross-section specific variables.

- Panel data provides a higher degree of freedom, hence a more efficient data set with more information and lower multicollinearity by combining cross-section and time series.

- Panel data reduces the multicollinearity by combining the information from periodical change of data and the variation between the micro-units.

- Panel data provides better analysis of dynamic adaptation.

- Panel data models allow the quantitative and qualitative factors to be determined together on the same model.

The panel data method has several advantages over the cross-sectional data. It is known that the use of the cross-sectional data is insufficient to explain the cause-effect relationship. Because it is possible to draw conclusions only on the relative status of a variable to the other variable at a certain time with the cross-section data.

In addition, since the country or company that is superior to a variable is also superior in other variables, there occurs a correlation problem. Also, there are many problems affecting the reliability of analyzes such as endogeneity, unobserved variable bias, and indeterminacy problems (ESRC, 2006: 3). Such problems in cross-section data are largely eliminated by adding time dimension. However, panel data analysis has some difficulties. First of all, collecting and harmonizing data in panel data studies is an important problem for researchers. Especially if the cross-sectional data is composed of countries, it is not always possible to obtain complete and reliable data for each country.

Econometric problems which are difficult to dissolve especially in nonlinear models arise with the data set which is short in size. In addition, it is possible to have a

restricted data in case of unanswered questions in missing observations or surveys. Panel data analysis is divided into two as a balanced and unbalanced panel according to the length of the cross section and time series. For each cross-section data, if it contains time-length data of equal length, i.e. if there is no missing data for all horizontal sections, it is called balanced panel and it is called unbalanced panel if the time series for some cross-section data is not equal (Hsiao, 2003). Table 3.2 shows how panel data is prepared.

In the Table;

- Horizontal cross-section data expressed as "I" from 1 to N represents, N number of countries.
  - Data expressed as "T" from 1 to T represents, T number of years.
  - Data expressed as "Y" from Y_{11} to Y_{NT} represents dependent variable.
  - Data expressed as "X" from $X1_{11}$ to XK_{NT} represents K number of independent variables from the first year to the last.
  -

Table 16: Example of a Panel Data Set

İ	T	Y_{it}	$X1_{it}$	….	XK_{it}
1	1	Y_{11}	$X1_{11}$	.	XK_{11}
.	.	.	.		.
.	.	.	.	.	
1	T	Y_{1T}	$X1_{1T}$	.	XK_{1T}
.	.	.	.	.	.
.	.	.	.	.	.
.	.	.	.	.	.
N	1	Y_{N1}	$X1_{N1}$	.	XK_{N1}
.	.	.	.	.	.
.	.	.	.	.	.
N	T	T_{NT}	$X1_{NT}$	.	XK_{NT}

Source: Baltagi, 2005

4.2. MODEL AND THE ESTIMATION METHOD

In this study, the cross-sectional data described in Section 4 which consists of 68 countries, time (t) covering the years 2004-2017, dependent variable (Y) was the country credit ratings given by CRAs, and the independent variable (X) was expressing variables. In this context, the panel data that will be used to explain the credit notes in the country will be entered into the following equation.

Equation 1

$$\text{LOG}(Y_{it}) = \beta_0 + \sum_{k=1}^{k} \beta_k * \text{LOG}(X_{kit}) + \varepsilon_{it}$$

$$i = 1, 2, \dots, N; \quad t = 1, 2, \dots, T$$

$$E(e_{it}) = 0 \quad \text{ve} \quad Var(e_{it}) = \sigma_\varepsilon^2$$

In the equation above, i = 1, 2, 3 …, N refers to the cross-section data and t = 1,2,3…, T indicates the time series. In this study, Yit refers to the independent variable i, which is the country's credit rating received in time t and Xkit refers to the variable k which affects the country's rating at time t. βk shows the coefficients of the independent variables and eit is the error term which have zero mean and fixed variance.

4.2.1. Panel Data Methodology

In the Equation (1) which is used in the panel data analysis, the coefficient of independent variables (βk) and the fixed term (β0) vary according to various assumptions. According to Judge et al. (1985), β0 and βk can have separate values with five different assumptions.

- The constant value and the slope coefficient are constant between time and cross sections, and the error term can capture differences over time and cross-sections.
- The slope coefficient is the same in all cross sections and time units, but the fixed term differs in cross sections.
- The slope coefficient is the same in all cross sections and time units, but the fixed term differs in both cross sections and time units.
- Fixed terms and coefficients vary across cross sections but constant over time.
- Fixed terms and coefficients vary between cross sections and time units.

Many tests can be performed to determine which of these assumptions will be used. Under the assumption that the coefficients are constant, the Breusch-Pegan test is used to test whether the fixed term ($\beta 0$) is constant or whether it changes according to country and time. If the null hypothesis that there is no individual component and the ordinary least squares (OLS) method is the best linear neutral estimator (BLUE) is rejected, it is concluded that there are individual effects. In this case, it is necessary to test whether this effect is random or constant as the second step.

4.2.1.1. Random Effects Model

In panel data analysis, if it is believed that there is no omitted variable in data set to explain the dependent variable or the missing variable is thought to be unrelated to the explanatory variables in the model, the use of the random effects model gives the best result. Since the units are randomly selected in the random effects model, the differences between the units are also random. In the regression analysis, it is generally assumed that there are many factors affecting the value of the dependent variable, but not in the model and these factors are summarized by a random residual (Balgati, 2001). The error term in Equation (1) is divided into two component which is shown below:

Equation 2

$$e_{it} = \mu_i + v_{it}.$$

where μ_i: indicates the unit error, unit differences and the variation between units according to fixed time and v_{it}: the remaining errors.

4.2.1.2. Fixed Effects Model

If there exists missing variables in the data set used in the panel data analysis and these variables are thought to be related to other variables, it is more appropriate to use the fixed effects model to eliminate the missing variable bias (Allison, 2009). In the fixed effects model, while the variable coefficients are the same for all cross-section units, the constant term takes individual value for each cross-section data because it contains an individual effect. The individual differences between the cross sections are thus expressed in the model. The constant term, which changes in cross-sectional dimensions, remains the same in the time dimension. The idea under this assumption is that the effect of omitted variables on the independent variable will have an effect not only in the first period but also in the later periods and the effect will remain constant over time (Allison, 2009). In the fixed effects model, the explanatory variables are assumed to be independent of the error term but the unit effects and independent variables are related (Baltagi, 2005).

Judge et al. (1985) state that the appropriate method to be used for panel data analysis should be determined by evaluating the economic intuition and the data set.

4.3. DATA

In this study, sovereign credit ratings and CDS premiums are analyzed using six social, eight economic and two dummy variables taking into consideration the studies in the national and international literature and the rating guidelines of CRAs. In the

study, three major CRA grades are used as an independent variable for the model on an annual basis. In order not to neglect some important economic and social variables as well as CDS premiums of the countries, the annual data is used for the period of 2004-2017 in this analysis. To make use of as many countries as possible, 68 countries, which are graded by major CRAs and have CDS premiums and also have reliable data are included in the analysis. The list of countries used in the study is presented in Annex 2. The countries that were included in the analysis include developed countries such as Netherlands, UK, Germany, Canada; developing countries such as Brazil and Argentina Turkey, Indonesia. In addition to countries with large economies such as China and the US, countries with small economies such as Panama and Malta are also included. Also, the list of countries have the diversification across regions.

Following Cantor and Packer (1996), Afonso (2002) and Ismailescu and Kazemi (2010), the values of the credit ratings of S&P, Moody's and Fitch Ratings institutions, which are the dependent variables used in the panel data, were converted into comprehensive credit ratings with the highest score of "22" and the lowest score "1" and 0.33 points added or subtracted according to outlook. Average sovereign credit ratings is calculated by taking average of the comprehensive credit ratings of three CRAs. In case that one of the ratings of CRAs are missing for a country, the average of other two CRAs are taken into account in order not to lose the country. The numerical values corresponding to the letter grades given by the CRAs included in the analyses are presented in Annex 3.

4.3.1.1. Social Variables

In the rating guides of the CRAs and the studies in the literature, World Bank Worldwide Governance Indicators (WGI) are used to digitize social and political structure of the countries. There are six main governance indicators in WGI.

4.3.1.1.1   Control of Corruption

This indicator measures the extent of public power which is used for elites and special interest groups and to what extent the state remains monopoly of these groups. In addition, this indicator demonstrates a country's policy effectiveness and institutional capacity to prevent corruption (World Bank, 2013). Countries are affected by control of corruption indicators according to below;

• The prevalence of large and small-scale corruption in all levels of state administration,

• The impact of corruption on a country's attractiveness as a place to start business,

• The existence of improper payments on import and export permits, public contracts, public services, tax inspections and judicial decisions,

• The existence of favoritism and favoritism in public services,

• Effectiveness of laws, government and government agencies on preventing corruption.

4.3.1.1.2   Government Effectiveness

This indicator measures the quality of public services, the capacity to implement policies without political pressure, and the reliability of government policy commitments. Countries are affected by government effectiveness indicators according to below;

- Effective implementation of government decisions and the conduct of public services independent of politics,

- Ability to carry out public services without major policy changes or interruptions.

- Income flow and budget management skills,

- Transport infrastructure, telecommunication, electricity supply, quality of public health and education services and availability of e-government services,

- The desire of new governments to meet the commitments of the former government in the context of political continuity,

- Implementation of budget applications as planned, lack of budget deviations and continuous control of the budget with modern and technological systems,

- Ability of correct calculation of the costs of the multi-year projects and the effectiveness of the institutions in the budget processes.

4.3.1.1.3   Political Stability and Absence of Violence

This indicator measures the likelihood of unconstitutional destabilization, including political violence and terrorism. Countries are affected by this indicator according to below;

- The existence and the number of long-term terrorist activities in the country as well as internal conflict and social unrest;

- Relations with border neighbors and presence of military threats from neighbors,

- Problems such as religious and ethnic social tensions.

4.3.1.1.4   Rule of Law

This indicator shows the extent that individuals and firms trust and comply with the rules of society, in particular, to the extent to which countries have achieved success in matters such as the enforcement of law and judicial system, enforcement of laws and contracts and protection of property rights. Countries are affected by rule of law indicator according to below;

- People's trust in law enforcement and the judicial system,

- Security of private property rights, protection of intellectual property; the accuracy and integrity of the property registration, whether the property of the citizens is protected from arbitrary or unfair practices,

- Effective and democratic control of the police and military forces by the judiciary, legislative and executive bodies.

4.3.1.1.5 Regulatory Quality

This indicator shows the public's ability to create healthy policies and legal arrangements to support the development of the private sector. Countries are affected by this indicator according to below;

- The prevalence of legal regulations and administrative requirements that create a burden on the private sector during a new business establishment or business closure,

- Intervention of state in the economy by providing support to areas that are not competitive,

- Complexity of tax systems,

- The existence of preventive arrangements concerning the entry and exit of foreign investors and the fact that domestic financial institutions are not open to external competition,

- Transparent and efficient structure of customs,

- In addition to financial markets, existence of policies and legislation supporting entrepreneurship and sustainability in real sectors.

4.3.1.1.6 Voice and Accountability

The concept of freedom of expression and transparency refers to the freedom of expression and association as well as the perception of independent media, as well as how effective they are in choosing their country's executives. Countries are affected by rule of law indicator according to below;

- People's faith in elections and democracy and their trust in parliament,

- Military guardianship on civil politics,

- Non-governmental organization and political party membership of the people,

- To be able to carry out the activities of the press and media without feeling themselves under any pressure,

- Accountability of political authority and public administrators to the public,

- Free access to all kinds of economic and social data.

4.3.1.2. Economic Variables

The economic variables used in the study were selected by taking into consideration the previous studies in the literature on CDS and sovereign credit ratings and the guides issued by the CRAs. In the study, the World Bank, IMF and Bloomberg databases were used to ensure the reliability and consistency of the data set covering the period of 2004-2017 for 68 countries.

4.3.1.2.1   GDP per Capita

One of the most important economic factors determining the country's credit rating and CDS premium is the per capita national income. In many studies conducted in previous periods, it was determined that per capita income was one of the significant variables explaining the country's credit rating.

Cantor and Packer (1996), Ferri and Stiglitz (1999), Afonso (2002), Reinhart et al. (2003), Sutton (2005) and Mora (2006) state that high per capita income increases tax collecting power, hence increases the capacity of debt payment of countries.

4.3.1.2.2   Current Account Balance

The current account balance, is composed of the balance of payments balance, foreign trade, services, investment income and current transfers balance (Ünsal, 2009). The deficit in the current account balance of the country leads to fragilities in the country's economy. The financing of the current account deficit through short-term capital movements increases the country's external dependency and increases its openness to external shocks.

4.3.1.2.3 Inflation

Inflation is one of the important factors affecting the country's credit rating and CDS premiums negatively. High level of inflation is perceived as an indicator of price instability in the country and hence no macroeconomic stability. Min (1998), Cantor and Packer (1996), Afonso (2002), Rowland and Torres (2004), Mora (2006), Taker et al. (2013) and Baltaci and Akyoll (2016) have determined the negative impact of inflation on the countries' credit ratings and CDP premiums. In addition to being a factor that increases macroeconomic imbalances, inflation is one of the major obstacles to investors and foreign capital to come to the country considering exchange rate effect.

4.3.1.2.4 General Government Gross Debt

General government gross debt stock represents the sum of all financial liabilities that public institutions and organizations have obtained from any external financing source. The ratio of debt stock to the national income of the country is one of the most important factors in the country risk assessments of CRAs and financial investors. The ratio of the general government gross debt stock to the GDP, in other words, the high debt burden increases the country's debt rollover risk and reduces the country's resilience to crises.

4.3.1.2.5 Unemployment Rate

Unemployment rate is one of the most significant indicators of economic activity and revenue generation. The high rate of unemployment indicates a negative sign due to lower potential growth rate. Also high unemployment causes deterioration in the budget because of decreasing income tax revenues and increasing transfer payments. Liu and Morley (2013) and Figlewski et al. (2006) argued that unemployment rate has a significant impact on CDS premiums while Afonso et al. (2009) and Balıkçıoğlu (2013) found a significant relationship between unemployment and sovereign credit ratings.

4.3.1.2.6   Exports Share in GDP and Trade Openness

Exports constitutes an important part of the foreign currency receipts, hence the ability to pay foreign debts. In the literature there are many studies arguing the effect of exports to sovereign credit ratings and CFDS premium in many different forms such as exports/GDP ratio, exports/foreign debt ratio and exports/ imports ratio.

Similar to exports, trade openness, share of imports and exports in GDP is considered as an important factor. Trade openness as a consequence liberalization; is the expression of how free or how to apply strict policies in countries' commercial relations with the outside world (Saçık, 2008) Trade openness means that the countries have more relations with the outside world and show an integrated structure with the world. This positively affects the sovereign ratings of CRAs and CDS premiums. The reason for this is that the countries with economic relations with the outside world are more willing to pay their external debts to protect their international political and commercial dignity, as stated in rating guides of CRAs.

4.3.1.2.7   Exchange Rate Volatility

Volatility in exchange rate is one of the factors effecting the return on foreign investments and thereby sovereign credit ratings and CDS premiums. Volatility in exchange rate causes increasing uncertainties about exchange rate stability and increasing demand for higher risk premiums because of increasing default risk (Gadanecz et al., 2014:15).

4.3.1.2.8   Reserve Money Unit

As a factor that positively influences the country's credit rating, it is noted that countries with a reserve currency were less vulnerable to economic and financial

shocks. Having reserve currency indicates the confidence of countries' policies and institutions, the strength of their financial systems, and the country's large and open capital markets. In this context, the dummy variable is used for countries with reserve currency to include in the model.

4.3.1.2.9 Default History

CRAs state that the default of the countries that they experienced in previous periods were taken into consideration when determining the credit ratings. In this context, in order to include the country's default history in the model, following Cantor and Packer (1996), the dummy variable method was used for the countries that had defaulted in the last 20 years.

Table 17: Summary of Variables Used in the Analyzes

Variables	Abbreviations	Observation	Mean	Stan. Dev.	Min	Max
S&P Sovereign Credit Ratings	snp	952	15,9	4,6	1	22
Moody's Sovereign Credit Ratings	moody	951	16,0	4,7	2	22
Fitch Sovereign Credit Ratings	fitch	899	16,1	4,5	1	22
Avarage Sovereign Credit Ratings	note	952	15,9	4,6	2,6	22
Credit Default Swap Premium	cds	777	238,1	763,3	1	15047,4
Social Variables						
Control of Corruption Index	wgi_cc	952	67,0	24,7	4,3	100
Government Effectiveness Index	wgi_ge	952	71,6	20,1	7,7	100
Political Stability Index	wgi_ps	952	57,4	28,2	0,5	100
Regulatory Quality Index	wgi_rq	952	72,1	20,9	2,4	100
Voice and Accountability Index	wgi_va	952	66,4	26,4	4,7	100
Rule of Law Index	wgi_rl	947	68,2	24,4	0,5	100
Avarage of Governance Indicators	wgi	952	67,13	22,3989	7,3	99,8
Ecoonomic Variables						
GDP per Capita (USD)	gdp_pcs	935	25359,1	22511,0	902,9	111968,3
Current Account Balance	cab	940	0,2	8,1	-26,1	45,5
Inflation Rate	inf	950	191,4	1892,4	38,6	58123,5
Gen.Gov. Gross Debt (% of GDP)	gggdebt	952	53,7	37,3	0,1	237,6
Unemployment Rate	u	895	7,9	4,5	0,7	27,5
Export to GDP Ratio	exptogdp	931	48,9	35,2	8,2	230,0
Foreign Exchange Volatility	fxvol	952	1,9	1,7	0,2	18,4
Trade Opennes	tradeo	945	94,5	66,9	0	442,6
Monetary Union Dummy	dum_emu	952	0,2	0,4	0	1
Default History Dummy	dum_d	947	0,1	0,3	0	1

4.4. ESTIMATION OF SOVEREIGN CREDIT RATINGS AND CDS PREMIUMS

In this section, determinants of sovereign credit ratings are analyzed by panel data with the variables explained in Section 4.1.3. The analysis is conducted with Stata 13.0 which is one of the useful programs for panel data econometric applications. In order to reach the best model, several methods have been tried step by step. First of all, ordinary least squares (OLS) method was applied to pooled data. Results of regression with OLS method (Model 1) is given in Table 22.

In order to decide to the use of pooled, randomly effective model or fixed effect models in the estimation models, firstly Breusch-Pagan Lagrangian Multiplier (LM) Test is applied. With the LM test which allows selection of random effects model or pooled model, it is tested whether the variance of the unit effects is zero, in other words, whether the random effects can be solved by pooled model (Çakır and Küçükkaplan, 2012: 71).

Table 18: Results of Breusch-Pagan LM Test

```
Breusch and Pagan Lagrangian multiplier test for random effects

        lnnote[countrynum,t] = Xb + u[countrynum] + e[countrynum,t]

        Estimated results:
                              Var       sd = sqrt(Var)

                lnnote     .1100861        .3317923
                     e     .0129122        .1136319
                     u     .0200324         .141536

        Test:   Var(u) = 0
                          chibar2(01) =    976.19
                        Prob > chibar2 =   0.0000
```

Since the determined error margin is greater than the probability value of the chi-square statistics, the hypothesis that the variance is zero between the cross sections is rejected (Table 18). This indicates a significant difference between the cross-section data and thus the presence of the panel effect. The results the model which indicates random effects (Model2) are presented in Table 22. The fact that the OLS method

ignores unobservable group and time effects from the components of the panel analysis, requires the use of one of the fixed or random effects models in terms of the effectiveness of the prediction (Erdem and Tuğcu, 2012: 208). In this context, Hausman Test statistic was used to test which model would be appropriate.

According to Model 1 results which includes only pooled data estimation, political stability, regulatory quality and government effectiveness variables significantly affect the sovereign credit rating as governance indicator in positive direction as expected in the literature. On the other hand, real GDP per capita, exports to GDP ratio and reserve currency have significantly positive affect on ratings, while inflation, general government gross debt and unemployment rate negatively affect the ratings.

Comparing the results of Model 1 and Model 2 (RE effects) is observed that some variables such as exports/GDP and reserve currency lose their significance, while coefficients of some variables such as fx volatility, trade openness, default history change sign as they supposed to be, although they are still statistically insignificant.

One of the tests used to decide which model should be preferred, fixed effects (FE) or random effects (RE,) is the Hausman Test (Green, 2003: 301). The Hausman test is used to determine whether the difference between the parameter estimators of the fixed effects model and the parameter estimators of the random effects model is statistically significant (Cameron and Trivedi, 2005: 717). This test assumes that the fixed effects estimator is consistent and unbiased. The Hausman test statistic shows the chi-square distribution under the null hypothesis "the estimation of random effects is consistent and efficient". If the hypothesis cannot be rejected, it is concluded that the error terms components of the RE model are not related to the independent variables. According to results of Hausman Test given at Table 19, it is concluded that the independent variables are associated with the error terms components and FE model should be preferred. The results FE model (Model 4) is presented in Table 22.

Table 19: Hausman Test Results

```
   Test:  Ho:  difference in coefficients not systematic

              chi2(16) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                       =       27.71
           Prob>chi2 =      0.0342
           (V_b-V_B is not positive definite)
```

Model 4, has been examined whether there are heteroscedasticity and autocorrelation problems. In the case of the changing variance, the OLS estimators are unbiased but the variance and covariance estimates are not effective. In other words, the hypothesis tests lose their validity because they do not have a minimum variance. In addition, estimation and prediction ranges at certain level of significance expand (Albayrak, 2008). In order to test heteroscedasticity, Wald test was applied to Model.

Table 20: Wald Test Results

```
Modified Wald test for groupwise heteroskedasticity
in fixed effect regression model

H0: sigma(i)^2 = sigma^2 for all i

chi2 (63)  =   83105.27
Prob>chi2 =      0.0000
```

The hypothesis that there is no change in variance is rejected according to Wald Test statistical results (Table 20) which indicates that there is a heteroscedasticity problem in the model. One of the basic assumptions of regression analysis is that there is no relationship between the same error terms for different observations. This is called autocorrelation if the error terms are related to each other (Greene, 2003).

Table 21: Wooldridge Autocorrelation Test Results

```
Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
   F( 1,     62) =    1.688
         Prob > F =    0.1986
```

According to the results of the Wooldridge autocorrelation test in Table 21, the null hypothesis of first degree autocorrelation, cannot be rejected and therefore it is concluded the model does not include autocorrelation problem. To solve

heteroscedasticity problem, robust estimators, which also gives autocorrelation consistent results, are used in Model 4, of which results are presented at Table 22.

Analyzing the results of Model 4 which includes FE and robust estimators, it is seen that coefficients of political stability, regulatory quality, inflation, FX volatility, GDP per capita, general government gross debt / GSYH, unemployment variables are significant and their signs are consistent with rating guides of CRAs and the literature.

Table 22: Model Results (1-4)

VARIABLES	Model (1) CCR	Model (2) CCR	Model (3) CCR	Model (4) CCR
Control of Corruption	-0.016	-0.067	-0.051	-0.067
	(0.040)	(0.043)	(0.047)	(0.047)
Political Stability	0.025*	0.069***	0.078***	0.069***
	(0.013)	(0.018)	(0.020)	(0.024)
Voice and Accountability	-0.142***	-0.099**	-0.038	-0.099*
	(0.020)	(0.041)	(0.059)	(0.059)
Rule of Law	-0.102***	0.030	0.060	0.030
	(0.038)	(0.039)	(0.041)	(0.084)
Regulatory Quality	0.559***	0.252***	0.200***	0.252***
	(0.047)	(0.054)	(0.058)	(0.082)
Government Effectiveness	0.090*	0.107*	0.158**	0.107
	(0.054)	(0.058)	(0.064)	(0.133)
Inflation	-0.055***	-0.120***	-0.148***	-0.120***
	(0.020)	(0.027)	(0.034)	(0.036)
Current Account Balance	-0.018	-0.030***	-0.024**	-0.030**
	(0.012)	(0.011)	(0.011)	(0.015)
FX Volatility	0.013	-0.010	-0.014*	-0.010**
	(0.010)	(0.008)	(0.008)	(0.005)
Real GDP Per Capita	0.121***	0.165***	0.226***	0.165***
	(0.016)	(0.027)	(0.058)	(0.033)
Gen. Gov. Gross Debt	-0.041***	-0.065***	-0.069***	-0.065**
	(0.008)	(0.012)	(0.015)	(0.026)
Unemployment	-0.110***	-0.145***	-0.129***	-0.145***
	(0.013)	(0.019)	(0.023)	(0.041)
Exports/GDP	0.287***	-0.169	-0.348***	-0.169
	(0.091)	(0.113)	(0.130)	(0.129)
Trade Openness	-0.359***	0.067	0.267*	0.067
	(0.093)	(0.117)	(0.139)	(0.131)
Default History	0.010	-0.050	-0.070*	-0.050
	(0.026)	(0.036)	(0.041)	(0.038)
Reserve Money Unit	0.062***	-0.064*	-0.128***	-0.064
	(0.020)	(0.034)	(0.043)	(0.068)
Constant	0.907***	1.334***	0.196	1.334***
	(0.182)	(0.286)	(0.612)	(0.353)
Observations	814	814	814	814
Adjusted R-squared	0.71	0.66	0.63	0.63

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Model 4 ignores the fixed effects for time series while it takes into account for cross-sections. For the time series, the F-statistic is used to test whether the fixed effects are meaningful, i.e., the dummy variables used during the time series are zero.

Table 23: F Test Results

```
F test that all u_i=0:      F(62, 735) =    19.87              Prob > F = 0.0000

```

According to the test results in Table 23, the hypothesis that year coefficients are zero is rejected. This results in a significant effect of time on the model. Therefore Model 5 which includes both cross section and time effects on panel data is solved and presented in Table 24.

The first five models is presented to show the steps to reach the best model between alternatives. After dropping insignificant variables and variables which are working theoretically opposite way, Model 6 is developed as the main model. The logiacal framework of using deduction method is to include as much as variables which may have an impact on sovereign credit ratings and eliminate some of them according to their significance. As a result, Model 6 is the best fitting and best representative model for sovereign credit ratings.

According to the results of Model 6, there are two governance and three economic indicators, and one dummy variable which significantly affect sovereign credit ratings. The change in political stability and regulatory quality percentile ranks, as the representatives of social indicators, positively affect sovereign credit ratings. Analyzing the results of the Model 6 in terms of economic variables, it is seen that real GDP per capita positively affects the sovereign credit ratings while GDP share of general government gross debt and unemployment negatively affect. It is also observed that having a default case in history also significantly affect countries` sovereign ratings negatively.

Applying the same rules to CDS premiums as depended variable instead of CCR, Model 8 is developed as the best estimating model with the same data and logical framework of development of Model 6. Comparing the Model 6 and Model 8, it is seen that determinants of CCR and CDS premiums are similar. On the other hand, exchange rate volatility and inflation significantly CDS premiums different than CCR. Also, political stability has not a significant impact on CDS premiums.

Table 24: Model Results (5-8)

VARIABLES	Model (5) CCR	**Model (6) CCR**	Model (7) CDS	**Model (8) CDS**
Control of Corruption	-0.068		0.077	
	(0.047)		(0.228)	
Political Stability	0.067***	**0.066****	-0.094	
	(0.022)	**(0.028)**	(0.107)	
Voice and Accountability	-0.108**		0.069	
	(0.053)		(0.230)	
Rule of Law	0.025		0.093	
	(0.077)		(0.318)	
Regulatory Quality	0.261***	**0.260****	-0.958**	**-0.788****
	(0.083)	**(0.072)**	(0.408)	**(0.354)**
Government Effectiveness	0.087		-0.461	
	(0.134)		(0.430)	
Inflation	**-0.042**		**0.140****	**0.116****
	(0.037)		**(0.042)**	**(0.035)**
Current Account Balance	-0.026*		0.079	
	(0.014)		(0.067)	
FX Volatility	**-0.010***		**0.124****	**0.095****
	(0.006)		**(0.048)**	**(0.045)**
Real GDP Per Capita	0.174***	**0.126****	-0.455***	**-1.697****
	(0.032)	**(0.030)**	(0.146)	**(0.676)**
Gen. Gov. Gross Debt	-0.050**	**-0.048****	0.225*	**0.286***
	(0.022)	**(0.024)**	(0.120)	**(0.171)**
Unemployment	-0.168***	**-0.228****	0.674***	**0.667****
	(0.042)	**(0.059)**	(0.133)	**(0.204)**
Exports/GDP	-0.183		0.504	
	(0.128)		(0.821)	
Trade Openness	0.118		-0.034	
	(0.130)		(0.843)	
Default History	-0.056	**-0.109****	0.351	**0.401****
	(0.041)	**(0.047)**	(0.261)	**(0.151)**
Reserve Money Unit	-0.045		0.005	
	(0.060)		(0.248)	
Constant	0.840**	**0.828****	9.588***	**19.883****
	(0.367)	**(0.291)**	(1.944)	**(6.578)**
Observations	814	**874**	697	**643**
Adjusted R-squared	0.68	**0.66**	0.70	**0.57**

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

One of the confounding results of the models is the insignificance of current account balance on both sovereign credit ratings and CDS premiums. There may be couple of reasons for this result. Firstly, countries such as Australia, Ireland, France, New Zealand, Spain, UK and USA have very high credit ratings, although they have current account deficit for many years. Secondly, the time period of this study includes global financial crisis and European debt crisis. It is known that in crisis periods the current account balance mostly improves due to decreasing domestic demand and imports. On the other hand, CDS premiums rise and sovereign credit ratings mostly fall during crisis periods. Therefore, structural link between current account balance, credit ratings and CDS premiums may not be observed in the analysis. As Hancı (2013:104) states, besides the fact that there are many factors that affect the CDS premiums, the trend of each country is not the same because of the differences in the dynamics of the countries and the factors affecting the CDS in each country may differ. The findings of the findings of this study are consistent with previous studies (Lee et al.:2015; Remolona et al.: 2008; Aizenman et al.:2010), which concludes that local and macroeconomic fundamentals have significant effect on CDS premiums.

Analyzing the fixed effect coefficients of individual countries in both CCR and CDS estimation models, it is seen that there is no regional differences between countries that have significant coefficients. Also, it is observed that the coefficients of developing countries are mostly significantly positive which indicates that CRAs do not favor developed countries in their ratings, contrary to expectations and criticisms. It can be said that the same is also valid for CDS premiums.

As a last analysis, it is tried to examine whether it is possible to estimate sovereign credit ratings with CDS premiums. There are previous studies which try to conduct similar research with different data and time dimensions Hull et al. (2004) questioned whether corporate CDS premiums can anticipate the rating changes before. They found that CDS spreads includes the new information about the reference entity and can anticipate the change in ratings before. Ismailescu and Kazemi (2010) made a similar research on CDS premiums and sovereign ratings and concluded that change in CDS spreads can anticipate the sovereign rating changes of the country one month

before. Rodrigues et al. (2018) applied the previous methodologies to yearly data and tried to anticipate the sovereign ratings with average CDS spreads of previous three years.

Following Rodríguez et. al. (2018), it is tried to estimate the sovereign credit ratings with CDS premiums. CDS premiums of countries with their one and two year lags are used as independent variables to estimate the sovereign rating countries. Combining the study of Rodríguez et. al. (2018) and the same methodology of this study, the same estimation method with sovereign credit rating and CDS models (FE models) in this study is applied also to model 9. This will allow comparing the estimation power of macroeconomic and political variables and CDS premiums on sovereign credit ratings.

Table 25: Results of Model 9

VARIABLES	CCR
CDS Spreads	-0.131***
	(0.038)
CDS Spreads $_{T-1}$	-0.057**
	(0.025)
CDS Spreads $_{T-2}$	-0.046***
	(0.010)
Constant	3.475***
	(0.153)
Observations	438
R-squared	0.565

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

At Table 25 the results of the estimation is presented and it is seen that it is possible to explain the change in sovereign credit ratings by %56 percent with only CDS premiums. Considering the explanatory power of alternative Model 6 (%66), CDS premium is a strong indicator for sovereign credit ratings that composes both social and economic indicators of countries. The results are consistent with studies of Hull et al. (2004), Ismailescu and Kazemi (2010) and Rodrigues et al. (2018) that CDS

premiums itself have a similar explanatory power with all other macroeconomic and governance indicators.

CONCLUSION

The credit risk of a country can affect the investment flows, especially through the interest rate, both in positive and negative manner. The most important indicators that show the risk status of the countries are accepted as the sovereign credit ratings. The sovereign credit ratings given by CRAs are of vital importance for developing countries, especially those seeking to accelerate their economic growth and development. The countries with credit rating at the investment grade level, provide cheaper and long-term financing opportunities to finance their investments. Also, they increase the dignity of the country in the international arena and positively affects foreign direct investments. Therefore, the credit ratings issued have the power to directly and indirectly influence the national economy.

As CRAs increased their market power and activities, their criticism towards these institutions also increased over time. CRAs are often exposed to criticism by academia, policy and business circles for reasons such as lack of transparency and competition, their inability to foresee crises and deepening of crises through decisions. This has led market actors to move towards alternative methods of measuring country risk which increased the importance of CDS.

CDS premiums, reflecting the economic and financial performance of a country and resilience to shocks, directly affect the costs of foreign borrowing. It also clearly reflects the developments in the credit costs of economic agents in the country. Therefore, it is interpreted as an important indicator of the performance of the real economy. Changes in CDS premiums reflect both the current situation and the expectations regarding the country's economic performance and thus are taken into consideration by international investors in assessing the country's credit risk. It is thought that the relationship between macroeconomic and financial variables and CDS premiums will be evident in the periods when financial stress is high and fluctuations in credit markets increase. Therefore, it is possible to make a prediction about the country's credit risk by looking at the CDSs traded in the market.

Concerning the impact of sovereign credit ratings and CDS premiums on individual economies, this study has analyzed the determinants of sovereign credit ratings and CDS premiums in a structural perspective. The main aggregates of economies and main political variables are used to explain the sovereign credit ratings and CDS premiums.

In this context, pane data method is used in this study to solve the problem of data deficiency due to limited time series and to make comparisons between the countries. To make use of as many countries as possible, which are graded by major CRAs and have CDS premiums, annual data is used for the period of 2004-2017 in this analysis.

According to the results of the models created by reverse engineering with panel data method to determine the factors that affect the credit ratings and CDS premiums, determinants of sovereign credit ratings and CDS premiums are very similar. It is found that real GDP per capita, political stability and regulatory quality positively affect sovereign credit ratings, while GDP share of general government gross debt and unemployment and default history have negative affect on sovereign credit ratings. These variables have the ability to explain 66 percent of the changes in sovereign credit ratings.

Applying the same data and method on CDS premiums, it is observed that real GDP per capita, regulatory quality, GDP share of general government gross debt, unemployment and default history have significant effect on CDS premiums, but in the opposite direction with sovereign credit rating as expected. On the other hand, exchange rate volatility and inflation significantly affect CDS premiums different than sovereign credit ratings. Also, it is observed that political stability has not a significant impact on CDS premiums.

The third analysis in the study is on estimating sovereign ratings with CDS premiums. According to the results of the analysis, CDS premium by itself is a strong indicator for sovereign credit ratings that composes both political and economic information of countries. CDS premiums, with its lags, have the ability to explain the change in

sovereign credit ratings by 57 percent. These results show that there is a strong relationship between sovereign credit ratings and CDS premiums in terms of their similar determinants and explanatory power of CDS premiums on sovereign credit ratings.

BIBLIOGRAPHY

Afonso, A. (2003). Understanding the determinants of sovereign debt ratings: Evidence for the two leading agencies. *Journal of Economics and Finance*, *27*(1), 56-74.

Afonso, A., Gomes, P., & Rother, P. (2009). Ordered response models for sovereign debt ratings. *Applied Economics Letters*, *16*(8), 769-773.

Akkaya, M. (2017). Türk Tahvillerinin CDS Primlerini Etkileyen İçsel Faktörlerin Analizi. *Maliye ve Finans Yazıları*, *1*(107), 130-145.

AKSOYLU, E., (2011). Bir Risk Yönetim Aracı Olarak Kredi Temerrüt Swapları:. *Uluslararası Sosyal Bilimler Dergisi*. 35 (4) 576-588.

Albayrak, A. S. (2008). Değişen Varyans Durumunda En Küçük Kareler Tekniğinin Alternatifi Ağirlikli Regresyon Analizi ve Bir Uygulama. *Afyon Kocatepe Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, *10*(2), 111-134.

Alexe, S., Hammer, P. L., Kogan, A., & Lejeune, M. A. (2003). A non-recursive regression model for country risk rating. *RUTCOR-Rutgers University Research Report RRR*, *9*, 1-40.

Alper, D. (2011). Kredi İflas Takası CDS. *Ekin Basım Yayın Dağıtım, Bursa*.

Arıcan, E. (2002). *Gelişmekte olan ülkelerde istikrar politikaları, Türkiye*. Derin.

Apaydın, U. E., & Ünlü, A. (1990). Kredi Değerliliği. Kredi Değerliliği. Hazine Ve Dış Ticaret Dergisi.

Augustin, P., Subrahmanyam, M. G., Tang, D. Y., & Wang, S. Q. (2016). Credit default swaps: Past, present, and future. *Annual Review of Financial Economics*, *8*, 175-196.

Bayramoğlu, D. (2012). Mali Sistemin Sıfırcı Hocaları, Tempo Dergisi

http://www.tempodergisi.com.tr/haberdetay/57588.aspx

Balıkçıoğlu, E. (2013). Ülkelerin Finansal Açıdan Kredi Notlarını Etkileyen Faktörler Ve Kurallı Maliye Politikasının Etkisi: 2000 Sonrası DönemTürkiye'de Uygulanan Maliye Politikalarının Kredi Notları Üzerindeki Etkisinin Karşılaştırmalı Analizi. Published Phd thesis, Ankara: Ankara University Social Sciences Institute.

Becker, B., & Milbourn, T. (2011). How did increased competition affect credit ratings?. *Journal of Financial Economics*, *101*(3), 493-514.

Brandorf, C., & Holmberg, J. (2010). Determinants of sovereign credit default swap spreads for piigs-a macroeconomic approach.

BRSA (2008). ABD Mortgage Krizi. Working Paper. *Retrieved from* http://www.bddk.org.tr/WebSitesi/turkce/Raporlar/Calisma_Raporlari/5176ABDMORTGAGE05082008x

Ben-Ami D.,(1991). How Do You Rate?.Banking World 9.7-19

Bissoondoyal-Bheenick, E. (2005). An analysis of the determinants of sovereign ratings. *Global Finance Journal*, *15*(3), 251-280.

Birdişli, F. (2012). Küresel Ekonomik Sistemin İşleyişi içinde Kredi Derecelendirme Kurumlarının İşlevi. *Turgut Özal Uluslararası Ekonomi ve Siyaset Kongresi II, Malatya İnönü Üniversitesi*, 19-21.

Božović, M., Urošević, B., & Živković, B. (2011). Credit rating agencies and moral hazard. *Panoeconomicus*, *58*(2), 219-227.

Burhan, V., & Mustafaoğlu, Z. (1998). *Asya krizinin Türkiye ihracatı üzerine muhtemel etkileri*. TC Başbakanlık Devlet Planlama Teşkilatı.

Cantor, R., & Packer, F. (1996). Determinants and impact of sovereign credit ratings. *Economic policy review*, *2*(2).

Celasun, M. (2002). 2001 Krizi, Öncesi ve Sonrası: Makroekonomik ve Mali Bir Değerlendirme. *Küreselleşme, Emek Süreçleri ve Yapısal Uyum*, 27-102.

Covitz, D. M., & Harrison, P. (2003). Testing conflicts of interest at bond rating agencies with market anticipation: Evidence that reputation incentives dominate.

Çelik, P. (2004). Bankaların Risk Derecelendirmesi, Uzmanlık Yeterlilik Tezi, TC Merkez Bankası Bankacılık ve Finansal Kuruluşlar Gn. *Müdürlüğü, Ankara*.

Darbellay, A. (2018). The Role of Credit Rating Agencies in Sovereign Debt Markets. *Sovereign Debt and Human Rights,* 146-166. doi:10.1093/oso/9780198810445.003.0009

Das, S. R., Hanouna, P., & Sarin, A. (2006). Fundamentals-based Versus Market-Based Cross-Sectional Models of CDS Spreads. *Unpublished working paper Santa Clara University*.

Deutche Welle. Kredi derecelendirme kuruluşları geç mi tepki verdi? (2007, August 22). Retrieved from https://www.dw.com/tr/kredi-derecelendirme-kuruluşları-geç-mi-tepki-verdi/a-2747567-1

Ettinger, R. P., & Golieb, D. E. (1921). *Credits and collections*. Prentice-Hall, Incorporated.

Ferri, G., Liu, L. G., & Stiglitz, J. E. (1999). The procyclical role of rating agencies: Evidence from the East Asian crisis. *Economic Notes*, *28*(3), 335-355.

Frost, C. A. (2007). Credit rating agencies in capital markets: A review of research evidence on selected criticisms of the agencies. *Journal of Accounting, Auditing & Finance*, *22*(3), 469-492.

Gaillard, N. (2012). The Booms and Busts of the Sovereign Rating Activity. In *A Century of Sovereign Ratings* (pp. 3-11). Springer, New York, NY.

GERGEN, D. (1996). Free Market Society, Interview with Thomas Freedman.

Gür, T. H. (2001). A country risk assessment model and the Asian crisis. Central Bank Review, 1(1), 49-68.

Gür, T.H. (1998), "External Debt and Empirical Models for Country Risk Assessment", Capital Markets Board of Turkey (SPK), Pub. Number 117, Ankara, (1995) Ph.D. Dissertation, State University of New York at Albany, Department of Economics.

GÜR, T , ÖZTÜRK, H . (2011). Ülke Riski, Derecelendirme Kuruluşları, Aksaklıklar ve Yeni Düzenlemeler. Sosyoekonomi, 16 (16). Retrieved from http://dergipark.org.tr/sosyoekonomi/issue/21076/226911

Halıcı, N. S. (2005). *Kredi Derecelendirme Şirketleri, Kredi Derecelendirme Belirleyicileri ve Etkileri* (Doctoral dissertation, Master Thesis, Erciyes University, SBE, Kayseri).

Hempel, G. H. (1971). The postwar quality of state and local debt. *NBER Books*.

Hoffinger, D. (2009). *US Bank Stocks and the Subprime Crisis:* "An event Study in times of ad-hoc write-off announcements due to the subprime crisis.GRIN Verlag.

Hull, J., Predescu, M., ve White, A. 2004. "The relationship between credit default swap spreads, bond yields, and credit rating announcements", Journal of Banking & Finance, *28*(11), 2789-2811.

Hunt, J. P. (2009). Credit rating agencies and the worldwide credit crisis: The limits of reputation, the insufficiency of reform, and a proposal for improvement. *Colum. Bus. L. Rev.*, 109.

Ismailescu, I., & Kazemi, H. (2010). The reaction of emerging market credit default swap spreads to sovereign credit rating changes. Journal of Banking & Finance, 34(12), 2861-2873.

ISDA. (2014). Credit Derivatives Definitions Protocol. Retrieved from https://www.isda.org/protocol/isda-2014-credit-derivatives-definitions-protocol/

Joseph, C. 2013. Advanced Credit Risk Analysis and Management. UK: John Wiley&Sons.

Karaöz, M. A. (1990). Kredi Değerliliğinin Tespiti. *Hazine ve Dış Ticaret Müsteşarlığı Dergisi*, *1*.

Kaya, B., Kaya, E. Ö., & Yalçıner, K. (2015). Türkiye'nin Derecelendirme Notları Ve Kredi Temerrüt Swap Primlerinin Ekonomik Ve Sosyal Olaylara Tepkisinin Analizi. *Maliye ve Finans Yazıları*, *1*(103), 85-111.

Kalliomäki, M. (2012). Determinants of sovereign defaults: an examination of fundamental factors derived from credit ratings. Master Essay Institution of Economics University of Lund.

Kılıç, B. (1989). Derecelendirme (Rating) İşlemi, ABD'de Tahvil Derecelendirme Süreci. *SPK Araştırma Raporu*.

Kliber, A. (2011). Sovereign CDS instruments in Central Europe–linkages and interdependence. *Dynamic Econometric Models*, *11*, 111-128.

Körs, M. (2011). *Şirket tahvillerinin çoklu diskriminant analizi, sıralı logit ve sıralı probit modelleriyle derecelendirilmesi* (Master's thesis, TOBB Ekonomi ve Teknoloji Üniversitesi Sosyal Bilimler Enstitüsü).

Kübalı, V. (2000). 1994–1995 Meksika Krizi. *Kamu Yönetimi Dünyası Dergisi*, (2).

Liu, Y., & Morley, B. (2012). Sovereign credit default swaps and the macroeconomy. *Applied Economics Letters*, *19*(2), 129-132.

Longstaff, A.F., J. Pan, L.H. Pedersen and K.J. Singleton. (2007). "How Sovereign is Sovereign Credit Risk?". NBER Working Paper Series, National Bureau of Economic Research, Cambridge, Mass.

Manns, J. (2013). Downgrading rating agency reform. *Geo. Wash. L. Rev.*, *81*, 749.

Moody's History: A Century of Market Leadership. (n.d.). Retrieved December 10, 2018, from https://www.moodys.com/Pages/atc001.aspx

Mora, N. (2006). Sovereign credit ratings: Guilty beyond reasonable doubt?. *Journal of Banking & Finance*, *30*(7), 2041-2062.

Our History, S&P Global. (n.d.). Retrieved November 24, 2018, from https://www.spglobal.com/en/who-we-are/our-history

Özatay F. (2009) Krizler ve batan bankalar - Radikal. Retrieved from http://www.radikal.com.tr/yazarlar/fatih-ozatay/krizler-ve-batan-bankalar-951592/

Pan, J., & Singleton, K. J. (2008). Default and recovery implicit in the term structure of sovereign CDS spreads. *The Journal of Finance*, *63*(5), 2345-2384.

Papaioannou, G. (2011). Economic and market factors versus credit rating announcements, on credit default swap spreads. *International Journal of Economics and Finance*, *3*(5), 42.

Partnoy, F. (2002). The paradox of credit ratings. In *Ratings, rating agencies and the global financial system* (pp. 65-84). Springer, Boston, MA.

Plank, T. (2010). Do Macro-Economic Fundamentals Price Emerging Market Sovereign CDS Spreads?. *Available at SSRN 1765352*.

Poon, W. P. (2003). Are unsolicited credit ratings biased downward?. *Journal of Banking & Finance*, *27*(4), 593-614.

Reinhart, C. M. (2002). Default, currency crises, and sovereign credit ratings. *the world bank economic review*, *16*(2), 151-170.

Reinhart, C. M., Rogoff, K. S., & Savastano, M. A. (2003). Debt intolerance (No. w9908). National Bureau of Economic Research.

Remolona, E. M., Scatigna, M., & Wu, E. (2008). The dynamic pricing of sovereign risk in emerging markets: Fundamentals and risk aversion. Journal of Fixed Income, Vol. Spring.

Rodríguez, I. M., Dandapani, K., & Lawrence, E. R. (2019). Measuring Sovereign Risk: Are CDS Spreads Better than Sovereign Credit Ratings?. Financial Management, 48(1), 229-256.

Rowland, P., & Torres, J. L. (2004). Determinants of spread and creditworthiness for emerging market sovereign debt: A panel data study. *Borradores de Economía; No. 295*.

Rowland, P (2005). Determinants of Spread, Credit Ratings and Creditworthiness for Emerging Market Sovereign Debt: A Follow-Up Study Using Pooled Data Analysis.. *Mimeo. Banco de la República, Bogota*.

Sand, H. J. H. (2012). The Impact of Macro-EconomicVariables on the Sovereign CDS Spreads of the Eurozone Countries. *University of Groningen Faculty of Economics and Business*.

Sutton, G., & Tošovský, J. (2005). Potentially endogenous borrowing and developing country sovereign credit ratings. *Financial Stability Institute Occasional Paper*, *5*.

Scheicher, M., & Fontana, A. (2010). An analysis of euro area sovereign CDS and their relation with government bonds (No. 1271).

Schöpf, W. (2010). Credit Default Swap Trading Strategies, Diplomica, Germany

Setty, G., & Dodd, R. (2003). Credit rating agencies: Their impact on capital flows to developing countries. *Special Policy Report*, *6*, 1-24.

Standard & Poor's. (2013). Sovereign Government Rating Methodology and Assumptions. *Global Credit Portal. Rating Directs*.

Sylla, R. (2002). An historical primer on the business of credit rating. In *Ratings, rating agencies and the global financial system* (pp. 19-40). Springer, Boston, MA.

Şirvan, N. (2004). Kredi Derecelendirme ve Türkiye Ekonomisi. *Türkiye Kurumsal Yönetim Derneği Yayınları,(file:///C:/Users/hasan/Desktop/krediderecelendirme. pdf)*.

Standard & Poor's. (1998). Standard and Poor's Structured Finance Criteria. *Global Credit Portal*.

Standard & Poor's. Our History, Retrieved November 24, 2018, from https://www.spglobal.com/en/who-we-are/our-history

Tang, D. Y., & Yan, H. (2010). Market conditions, default risk and credit spreads. *Journal of Banking & Finance*, *34*(4), 743-753.

TCMB. (2010). Üç Aylık Bülten (10). Ankara

Teker, D., Pala, A., & Kent, O. (2012). Determinants of sovereign rating: factor based ordered probit models for panel data analysis modeling framework. *International Journal of Economics and Financial Issues*, *3*(1), 122-132.

Turguttopbaş, N. (2013). Kredi Temerrüt Swapları ve İlgili Riskin Gerçekleşmesi Durumunda Uygulanan Hukuki Prosedür. *Bankacılar Dergisi*, *84*, 37-53.

Tutar, E., Tutar, F., & Eren, M. V. (2011). Uluslararası Kredi Derecelendirme Kuruluşlarının Rolü, Güvenirlilik Açısından Sorgulanması Ve Türkiye, Akademik Bakış Dergisi, Issue: 25. *Akademik Bakış Dergisi*, *25*, 1-24.

Türk, M. (2008). Determing sovereign credit default swap spread by extended merton model in selected emerging markets.

Tütüncü Hasbi, D. (2012). *Kredi derecelendirme kuruluşları tarafından yapılan not değerlendirmelerinin ülke ekonomileri üzerine etkileri: Türkiye örneği* (Master's thesis, Adnan Menderes Üniversitesi, Sosyal Bilimler Enstitüsü).

YAZICI, M. (2009). Kredi Derecelendirme Kuruluşlarının Önemi ve Denetimi. *Maliye ve Finans Yazıları Dergisi*, *82*.

Yanar, İ. (2002). Derecelendirme (Rating) Faaliyeti ve Bankaların Derecelendirilmesi İşlemlerinin Analizi. *Türkiye Cumhuriyet Merkez Bankası, Teftiş Kurulu Başkanlığı*.

Yay, T., Yay, G. G., & Yılmaz, E. (2001). *Küreselleşme Sürecinde Finansal Krizler ve Finansal Düzenlemeler*. İstanbul Ticaret Odası.

ANNEX 1

LIST OF CREDIT RATING AGENCIES

1. <u>A.M. Best Company, Inc.</u>
Insurance industry emphasis.
US -- NRSRO
2. <u>Agusto & Co. Ltd.</u>
Nigeria
3. <u>Ahbor Rating</u>
Uzbekistan
4. <u>Apoyo & Asociados
Internacionales S.A.C.</u>
Peru -- Fitch Associate
5. <u>Bank Watch Ratings S.A.</u>
Ecuador -- Fitch Affiliate
6. <u>BRC Investor Services S.A.</u>
Colombia
7. <u>Capital Standards Rating
(CSR)</u>
Added: Apr-2011
Kuwait
8. <u>Calificadora de Riesgo, PCA</u>
Uruguay
9. <u>Capital Intelligence, Ltd.</u>
Cyprus
10. <u>Caribbean Information
& Credit Rating Services
Ltd. (CariCRIS)</u>
Caribbean
11. <u>Central European Rating
Agency (CERA)</u>
a/k/a: Fitch Polska, S.A.
Poland
12. <u>Chengxin International
Credit Rating Co., Ltd.</u>
China -- Moody's Affiliate
13. <u>China Lianhe Credit
Rating, Co. Ltd.</u>
China
14. <u>Clasificadora de Riesgo
Humphreys, Ltda.</u>
Chile -- Moody's Affiliate
15. <u>Class y Asociados S.A.
Clasificadora de Riesgo</u>
Peru

16. <u>CMC International, Ltd.</u>
Nigeria
17. <u>Companhia Portuguesa
de Rating, SA (CPR)</u>
Portugal
18. <u>Credit Analysis &
Research Ltd (CARE)</u>
India
19. <u>"Credit-Rating": A
Ukrainian rating agency</u>
Added: Mar-2010
Ukraine -- Рейтинговое
Агентство "Кредит-
Рейтинг"
20. <u>Credit Rating Agency of
Bangladesh, Ltd. (CRAB)</u>
Bangladesh
21. <u>Credit Rating
Information and Services,
Ltd. (CRISL)</u>
Bangladesh
22. <u>CRISIL, Ltd.</u>
f/k/a: Credit Rating
Information Services of India
India -- S&P Affiliate
23. <u>Dagong Global Credit
Rating Co., Ltd.</u>
China
24. <u>Demotech, Inc.</u>
Insurance industry emphasis.
US -- Added: Apr-10
25. <u>Dominion Bond Rating
Service (DBRS)</u>
Canada -- NRSRO
26. <u>Duff & Phelps de
Colombia, S.A., S.C.V</u>
Colombia -- Fitch Affiliate
27. <u>Ecuability, SA</u>
Ecuador
28. <u>Egan-Jones Rating
Company</u>
US -- NRSRO

29. Emerging Credit Rating Ltd (ECRL)
Added: Apr-2011
Bangladesh -- Collaboration with MARC

30. Equilibrium Clasificadora de Riesgo
Peru -- Moody's Affiliate

31. European Rating Agency (ERA)
UK

32. Feller Rate Clasificadora de Riesgo
Chile -- S&P Affiliate

33. Fitch Ratings, Ltd.
US/UK -- NRSRO

34. Global Credit Rating Co.
S.Africa

35. HR Ratings de Mexico, S.A. de C.V.
Added: Jan-2009
Mexico

36. Interfax Rating Agency (IRA)
Russia

37. Investment Information and Credit Rating Agency (ICRA)
India

38. Islamic International Rating Agency, B.S.C. (IIRA)
Bahrain

39. Istanbul International Rating Services, Inc.
a/k/a: TurkRating
Added: Oct-09
Turkey

40. Japan Credit Rating Agency, Ltd. (JCR)
Japan -- NRSRO

41. JCR Avrasya Derecelendime A.S.
a/k/a: JCR Eurasia Rating
Added: Oct-09
Turkey -- JCR Affiliate

42. JCR-VIS Credit Rating Co. Ltd.
Pakistan -- JCR Affiliate

43. Kobirate Uluslararası Kredi Derecelendirme ve Kurumsal Yönetim Hizmetleri A.Ş.
a/k/a/ Kobirate
Added Oct-09
Turkey

44. Korea Investors Service, Inc. (KIS)
Korea -- Moody's Affiliate

45. Korea Ratings Corporation
f/k/a: Korea Management Consulting and Credit Rating Corp. (KMCC)
Korea -- Fitch Affiliate

46. Kroll Bond Rating Agency, Inc.
Wholly acquiring LACE Financial Corp. in Aug-2010
US -- NRSRO

47. Lanka Rating Agency, Ltd. (LRA)
Sri Lanka -- Subsidiary of RAM

48. Malaysian Rating Corporation Berhad (MARC)
Malaysia -- Fitch Affiliate

49. Mikuni & Co., Ltd.
Japan

50. Moody's Investors Service
US -- NRSRO

51. National Information & Credit Evaluation, Inc. (NICE)
Korea

52. ONICRA Credit Rating Agency of India, Ltd.
India

53. P.T. Kasnic Credit Rating Indonesia -- Indonesia

Indonesia -- Moody's
Affiliate
54. <u>P.T. PEFINDO Credit
Rating Indonesia</u>
a/k/a: PT Pemeringkat Efek
Indonesia
Indonesia
55. <u>Pacific Credit Rating
(PCR)</u>
a/k/a: Clasificadora de
Riesgo Pacific Credit Rating
S.A.C.
Peru
56. <u>Pakistan Credit Rating
Agency, Ltd. (PACRA)</u>
Pakistan -- Fitch former
affiliate
57. <u>Philippine Rating
Services, Corp. (PhilRatings)</u>
Philippines
58. <u>RAM Rating Services
Berhad (RAM)</u>
f/k/a: Rating Agency
Malaysia Berhad
Malaysia -- S&P Affiliate
59. <u>Rapid Ratings
International, Inc.</u>
Australia/NZ
60. <u>Rating and Investment
Information, Inc. (R&I)</u>
Japan -- NRSRO
61. <u>Realpoint, LLC</u>
Added: Jan-2009
US -- NRSRO
62. <u>RusRating</u>
Russia
63. <u>Saha Kurumsal Yönetim
ve Kredi Derecelendirme
Hizmetleri A.Ş</u>
Added: Oct-2009
Turkey
64. <u>Seoul Credit Rating &
Information, Inc.</u>
Korea -- JCR Affiliate
65. <u>Shanghai Credit
Information Services Co.,</u>

<u>Ltd.</u>
China
66. <u>Shanghai Far East Credit
Rating Co., Ltd.</u>
a/k/a: Xinhua Far East Credit
Ratings
China
67. <u>Slovak Rating Agency,
a.s. (SRA)</u>
a/k/a: Slovenská ratingová
agentúra, a.s.
Balkans -- ERA Affiliate
68. <u>SME Rating Agency of
India Limited (SMERA)</u>
Added: Apr-2008
India
69. <u>Sociedad Calificadora
de Riesgo Centroamericana,
S.A. (SCRiesgo)</u>
Costa Rica
70. <u>SR Rating Prestação de
Serviços Ltda.</u>
Added: Oct-2011
Brazil
71. <u>Standard and Poors
(S&P)</u>
US -- NRSRO
72. <u>Taiwan Ratings, Corp.
(TCR)</u>
Taiwan -- S&P Affiliate
73. <u>Thai Rating and
Information Services Co.,
Ltd. (TRIS)</u>
Thailand
74. <u>TheStreet.com Ratings,
Inc.</u>
f/k/a: Weiss Ratings, Inc.
US
75. <u>TCR Kurumsal Yonetim
ve Kredi Derecelendirme
Hizmetleri A.S.</u>
a/k/a: Türk KrediRating
(TCRating)
Turkey
76. <u>Veribanc, Inc.</u>
US

ANNEX 2

LIST OF COUNTRIES

1. Argentina	2. Latvia
3. Australia	4. Lebanon
5. Austria	6. Lithuania
7. Belgium	8. Luxembourg
9. Brazil	10. Malaysia
11. Bulgaria	12. Malta
13. Chile	14. Mexico
15. China	16. Morocco
17. Colombia	18. Netherlands
19. Costa Rica	20. New Zealand
21. Croatia	22. Norway
23. South Cyprus	24. Oman
25. Czechia	26. Pakistan
27. Denmark	28. Panama
29. Egypt	30. Peru
31. El Salvador	32. Philippines
33. Estonia	34. Poland
35. Finland	36. Portugal
37. France	38. Qatar
39. Germany	40. Romania
41. Greece	42. Russia
43. Honkong	44. Slovakia
45. Hungary	46. Slovenia
47. Iceland	48. South Africa
49. India	50. Spain
51. Indonesia	52. Sweeden
53. Ireland	54. Switzerland
55. Israel	56. Taiwan
57. Italy	58. Thailand
59. Japan	60. Turkey
61. Jordan	62. United Kingdom
63. Kazakhstan	64. USA
65. Korea	66. Uruguay
67. Kuwait	68. Venezuella

ANNEX 3

NUMERICAL TRANSFORMATION OF SOVEREIGN CREDIT RATINGS

S&P	Moody's	Fitch	Comprehensive Credit Rating
AAA	Aaa	AAA	22
AA+	Aa1	AA+	21
AA	Aa2	AA	20
AA-	Aa3	AA-	19
A+	A1	A+	18
A	A2	A	17
A-	A3	A-	16
BBB+	Baa1	BBB+	15
BBB	Baa2	BBB	14
BBB-	Baa3	BBB-	13
BB+	Ba1	BB+	12
BB	Ba2	BB	11
BB-	Ba3	BB-	10
B+	B1	B+	9
B	B2	B	8
B-	B3	B-	7
CCC+	Caa1	CCC+	6
CCC	Caa2	CCC	5
CCC-	Caa3	CCC-	4
CC	Ca	CC	3
C	C	C	2
D	WR	D	1

ANNEX 4

FE COEFFICIENTS OF CCR MODEL (MODEL 6)

Country	FE Coefficient	Country	FE Coefficient	Country	FE Coefficient
Australia	-0.0757	Iceland	-0.347	Peru	0.410***
	-0.286		-0.271		-0.0521
Austria	0.0492	Indonesia	0.915***	Philippines	0.751***
	-0.28		-0.186		-0.119
Belgium	0.137	Ireland	-0.117	Poland	1.102***
	-0.266		-0.294		-0.24
Brazil	0.425***	Israel	0.284	Portugal	0.481***
	-0.0414		-0.21		-0.073
Bulgaria	0.542***	Italy	0.125	Portugal	0.208
	-0.0832		-0.23		-0.155
Chile	0.397***	Japan	-0.03	Romania	0.353***
	-0.0926		-0.289		-0.0587
China	1.035***	Jordan	0.831***	Russia	0.526***
	-0.128		-0.165		-0.064
Colombia	0.793***	Kazakhstan	0.459***	Slovakia	0.473***
	-0.101		-0.0587		-0.106
Costa rica	0.292***	Korea	0.135	Slovenia	0.224
	-0.0563		-0.161		-0.16
Crotia	0.342***	Kuwait	-0.211	South Africa	0.862***
	-0.081		-0.254		-0.0896
Czechia	0.233*	Latvia	0.376***	South Cyprus	-0.164
	-0.14		-0.076		-0.201
Denmark	-0.0606	Lebanon	0.374***	Spain	0.351*
	-0.309		-0.0794		-0.2
Egypt	1.060***	Lithuania	-0.385	Sweeden	0.0432
	-0.221		-0.393		-0.288
El Salvador	0.691***	Malaysia	0.431***	Switzerland	-0.272
	-0.181		-0.0759		-0.354
Estonia	0.272**	Malta	0.173	Thailand	0.529***
	-0.115		-0.158		-0.147
Finland	0.106	Mexico	0.491***	Turkey	0.340***
	-0.269		-0.0601		-0.0681
France	0.269	Morocco	1.059***	USA	0.117
	-0.25		-0.197		-0.286
Germany	0.16	Netherlands	0.0165	United Kingdom	0.16
	-0.261		-0.288		-0.252
Greece	-0.164	New Zealand	0.0517	Uruguay	0.156**
	-0.176		-0.227		-0.0629
Honkong	-0.226	Norway	-0.321	Venezuela	0.561***
	-0.23		-0.378		-0.0897
Hungary	0.240***	Panama	1.286***		
	-0.0887		-0.368		

ANNEX 5

FE COEFFICIENTS OF CDS MODEL (MODEL 8)

Country	FE Coefficient	Country	FE Coefficient	Country	FE Coefficient
Australia	1.302	Honkong	2.497**	Pakistan	1.69
	-1.161		-1.133		-1.497
Austria	0.881	Hungary	-0.0212	Panama	-4.906***
	-1.157		-0.414		-1.688
Belgium	0.565	Iceland	2.288**	Peru	-1.029***
	-1.155		-1.078		-0.276
Brazil	-0.788***	Indonesia	-2.678***	Philippines	0.410***
	-0.268		-0.943		-0.0521
Bulgaria	-1.067**	Ireland	1.766	Poland	0.751***
	-0.469		-1.296		-0.119
Chile	0.077	Israel	0.677	Portugal	1.102***
	-0.479		-0.849		-0.24
China	-2.904***	Italy	0.834	Romania	0.481***
	-0.738		-1.007		-0.073
Colombia	-1.904***	Japan	0.494	Russia	0.208
	-0.422		-1.197		-0.155
Costa rica	-0.384	Kazakhstan	-0.813**	Slovakia	0.353***
	-0.39		-0.376		-0.0587
Crotia	-0.332	Korea	0.778	Slovenia	0.526***
	-0.416		-0.557		-0.064
Czechia	0.0888	Kuwait	1.901***	South Africa	0.473***
	-0.535		-0.667		-0.106
Denmark	1.135	Latvia	0.207	South Cyprus	0.224
	-1.259		-0.374		-0.16
Egypt	-3.730***	Lithuania	-0.277	Spain	0.862***
	-1.063		-0.402		-0.0896
El Salvador	-2.473**	Malaysia	-0.277	Sweden	-0.164
	-0.965		-0.402		-0.201
Estonia	0.628	Mexico	-0.575	Taiwan	0.351*
	-0.565		-0.392		-0.2
Finland	0.459	Morocco	-1.283***	Turkey	0.0432
	-1.149		-0.21		-0.288
France	0.188	Netherlands	-3.967***	USA	-0.272
	-1.091		-0.908		-0.354
Germany	0.415	N. Zealand	0.93	United Kingdom	0.529***
	-1.089		-1.181		-0.147
Greece	1.031	Norway	0.812	Uruguay	0.340***
	-0.841		-0.9		-0.0681
				Venezuella	0.117
					-0.748

ORIGINALITY REPORT

HACETTEPE UNIVERSITY
GRADUATE SCHOOL OF SOCIAL SCIENCES
MASTER'S THESIS ORIGINALITY REPORT

HACETTEPE UNIVERSITY
GRADUATE SCHOOL OF SOCIAL SCIENCES
ECONOMICS DEPARTMENT

Date: 28/06/2019

Thesis Title: Analysis of the Relationship Between Sovereign Credit Ratings and Credit Default Swaps: A Comparative Study for Turkey and Selected Countries

According to the originality report obtained by myself/my thesis advisor by using the Turnitin plagiarism detection software and by applying the filtering options checked below on 28/06/2019 for the total of 107 pages including the a) Title Page, b) Introduction, c) Main Chapters, and d) Conclusion sections of my thesis entitled as above, the similarity index of my thesis is 14 %.

Filtering options applied:
1. ☒ Approval and Decleration sections excluded
2. ☒ Bibliography/Works Cited excluded
3. ☐ Quotes excluded
4. ☒ Quotes included
5. ☒ Match size up to 5 words excluded

I declare that I have carefully read Hacettepe University Graduate School of Social Sciences Guidelines for Obtaining and Using Thesis Originality Reports; that according to the maximum similarity index values specified in the Guidelines, my thesis does not include any form of plagiarism; that in any future detection of possible infringement of the regulations I accept all legal responsibility; and that all the information I have provided is correct to the best of my knowledge.

I respectfully submit this for approval.

28/06/2019

Name Surname:	Fatih Bahadır HASPOLAT
Student No:	N15229112
Department:	Economics
Program:	Economics

ADVISOR APPROVAL

OK

APPROVED.

Assoc. Prof. Dr. Nasip BOLATOĞLU

ETHIC COMISSIONS FORM

HACETTEPE UNIVERSITY
GRADUATE SCHOOL OF SOCIAL SCIENCES
ETHICS COMMISSION FORM FOR THESIS

HACETTEPE UNIVERSITY
GRADUATE SCHOOL OF SOCIAL SCIENCES
ECONOMICS DEPARTMENT

Date: 28/06/2019

Thesis Title: Analysis of the Relationship Between Sovereign Credit Ratings and Credit Default Swaps: A Comparative Study for Turkey and Selected Countries
My thesis work related to the title above:

1. Does not perform experimentation on animals or people.
2. Does not necessitate the use of biological material (blood, urine, biological fluids and samples, etc.).
3. Does not involve any interference of the body's integrity.
4. Is not based on observational and descriptive research (survey, interview, measures/scales, data scanning, system-model development).

I declare, I have carefully read Hacettepe University's Ethics Regulations and the Commission's Guidelines, and in order to proceed with my thesis according to these regulations I do not have to get permission from the Ethics Board/Commission for anything; in any infringement of the regulations I accept all legal responsibility and I declare that all the information I have provided is true.

I respectfully submit this for approval.

28/06/2019

Name Surname:	Fatih Bahadır HASPOLAT
Student No:	N15229112
Department:	Economics
Program:	Economics
Status:	☒ MA ☐ Ph.D. ☐ Combined MA/ Ph.D.

ADVISER COMMENTS AND APPROVAL

OK

Assoc. Prof. Dr. Nasip BOLATOĞLU