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Waiting For The Confidence Fairy: An Analysis Of European Sovereign Bond Spreads Before And After The Financial Crisis

David Uresti
University of Texas at El Paso, dguresti@yahoo.com

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WAITING FOR THE CONFIDENCE FAIRY:
AN ANALYSIS OF EUROPEAN SOVEREIGN BOND SPREADS BEFORE
AND AFTER THE FINANCIAL CRISIS

DAVID GERARD URESTI

Department of Political Science

APPROVED:

Charles Boehmer, Ph.D., Chair

Gaspare Genna, Ph.D.

Erik Devos, Ph.D.

Charles Ambler, Ph.D.
Dean of the Graduate School
Dedication

For those suffering needlessly.
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The 2008 Financial Crisis that began in the United States caused widespread panic throughout the financial sector which resulted in the collapse of some companies and large losses for others. The availability of credit declined even as investor confidence continued to deteriorate. The European periphery concluded that the Financial Crisis would be relegated to the American economy. However, in 2009 Greece suffered a credit downgrade that signaled that the financial shock entered European shores. Shortly thereafter Spain suffered a credit downgrade followed by Italy in 2010. Suddenly the threat of default by a number of European countries became very real. The European Central Bank produced a number of financial rescue packages meant to shore up the economies of its ailing sovereigns. In return, these countries were expected to enact austerity measures to lower their debt levels and raise investor confidence.

The purpose of this thesis is to determine the effects of austerity measures on investor confidence by analyzing sovereign bond spreads in European countries before, during, after the financial crisis, and investigate the success of those measures. I expect to find that bond spreads act as a proxy for how markets respond to austerity measures as a sign of risk and economic health.

The period of analysis extends from January 2007 to December 2013 and has been divided into 2 sub-periods. The first period encompasses the buildup to the financial crisis, which began in early 2007 and ended December 31, 2008. The second period is marked by the financial stabilization scheme brought on by bank rescue packages and encompasses the aftermath of the financial crisis from January 2009 to December 2013. This paper found that countries that applied austerity measures correlated with lower bond spreads, but this is due to other factors. Austerity measures did not significantly raise GDP, lower debt, or spur an influx of investment.
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INTRODUCTION

The 2008 Financial Crisis that began in the United States caused widespread panic throughout the financial sector that resulted in the collapse of some companies and large losses for others. The availability of credit declined and investor confidence deteriorated. The European periphery concluded that the financial crisis would be relegated to the American economy. However, in 2009 Greece suffered a credit downgrade that signaled that the financial shock entered European shores. Suddenly, the threat of default for a number of European countries became very real. The European Central Bank produced a number of financial rescue packages meant to shore up the economies of its ailing sovereigns. In return, these countries were expected to enact austerity measures to lower their debt levels and raise investor confidence.

What is austerity? Mark Blyth (2013, 2) defines austerity as "a form of voluntary deflation in which the economy adjusts through the reduction of wages, prices, and public spending to restore competitiveness, which is (supposedly) best achieved by cutting the state's budget, debts, and deficits." Governments promote "confidence" by cutting spending, thus showing investors that they are serious about reigning in debt. Austerity measures are nothing new and have existed for decades. In fact, countries that apply for loans with the International Monetary Fund (IMF) have to demonstrate the seriousness of their proposals by reducing spending and raising revenues. Furthermore, the IMF determines the credit worthiness of the state receiving the loan and evaluates the level of conditionality it must take in order to receive the loan.

The fact that some European Union member states are forced to take out loans and enact austerity measures is something almost unheard of in recent decades. Until recently, austerity measures were relegated to struggling developing countries found in South America, Africa, and the Middle East. However, the question of the effectiveness of austerity measures rises as EU states continue to suffer economic uncertainty. Indeed, many economists and financial experts
believe that austerity measures do not work and in fact cause further damage to already ailing sovereigns. Paul Krugman likens the belief of expansionary austerity as “waiting for the confidence fairy” (Krugman 2012). Therefore, it is important to determine whether austerity measures improve investor confidence and induce them to purchase more national debt.

1.1 Problem statement

The purpose of this thesis is to determine the effects of austerity measures on investor confidence by analyzing sovereign bond spreads in European countries before, during, after the financial crisis, and investigate the success of austerity measures.

In order to measure the effects of austerity measures on European sovereigns, this study analyzes sovereign bond spreads. Bonds are “fixed-income assets – essentially IOUs that promise the holder a specified set of payments” (Clifford Smith 2008). The interest rate on the bond, or ‘spread’, demonstrates what investors feel about the economic health of the country through their willingness to purchase a country’s debt. A low interest rate on the bond indicates that investors feel confident that the sovereign will pay back its debt. A higher interest rate indicates that investors feel less confident that the sovereign will pay back its debt and so require a higher yield. Thus, bond spreads make good proxies for the perceived financial state (confidence) of a nation.

Nonetheless, research on the movement of bond spreads is considerable especially when compared to other proxies for measurement such as credit default swaps (Winckelmann and Sorensen 2011). This can be attributed to the fact that bond spread analyses have been used by experts for a longer period of time in order to gauge the default risk of established and emerging markets. Moreover, European countries that were once considered at great risk of defaulting have failed to do so, underscoring the need for other forms of analysis.

This analysis follows the work of other researchers by analyzing the driving forces of bond spreads in the European Union. The author of this thesis will investigate a total of ten
European countries, including those known by the moniker PIIGS - Portugal, Ireland, Italy, Greece, and Spain. The remaining five countries are Austria, Belgium, France, Germany, and the Netherlands.

This study builds on existing literature by analyzing the determinants of sovereign bond spreads as they cross periods of time. The bond spreads are investigated from the period leading up to the financial crisis through the sovereign debt crisis up to the period that austerity measures are implemented. This period stretches from January 2007 to December 2013. Furthermore, this period is divided into 2 sub-periods in order to attain a more nuanced understanding of their determining factors. The analysis of the determinants is based on the theoretical approach by Dieckmann and Plank (2007), who state that bond instruments demonstrate significant degrees of co-movement with a country's domestic financial system. Winckelmann and Sorensen (2011) build upon the work of Dieckmann and Plank (2007) by adding more variables and extending the observed time period. First, they analyze the common factors of the spread and regress them upon global market factors. Then they add a set of local and risk factors and regress them upon the bond spreads to identify the determinants of spreads. This allows for a deeper understanding of the drivers of bond spreads as a market indicator and helps to determine whether global or local variables affect the price of credit risk.

The analysis of this thesis is centered on bond spreads acting as a proxy for confidence and how it is affected by austerity measures. The main focus is to determine how austerity measures affect European countries by identifying the determinants of sovereign bond spreads and comparing the results across different time periods. The thesis is assembled in a number of sections which contributes to the main purpose:

- Section 2 provides a literature review that delves into the theory of 'expansionary austerity' and the arguments for its usage. This section also describes various aspects of the financial crisis, its causes and effects.
• Section 3 presents an overview of the hypotheses and theoretical determinants on which the study is based.

• Section 4 outlines the OLS assumptions and the statistical properties of the panel corrected standard errors (PCSE) model. It also describes the results of the regression analysis.

• Section 5 analyzes three countries (Greece, Spain, and Italy) that are part of the PIIGS. This section investigates the effects of austerity measures on their economies and social strata. It also looks at comparisons between the euro and the gold standard.

• Section 6 finishes the thesis by suggesting improvements to the model and by reiterating the findings of the previous chapters.

1.2 Scope of the study

This paper analyzes sovereign bond spreads on ten EU countries: Austria, Belgium, France, Ireland, Italy, Germany, Greece, Portugal, the Netherlands, and Spain. Five countries are in poor economic health (Portugal, Ireland, Italy, Greece, and Spain) and five countries (Austria, Belgium, France, Germany, and the Netherlands) are in good or stable health. The objective of adding countries with different characteristics is to enhance the comparability of analysis (Winckelmann and Sorensen 2011). The country selection is based on data availability with the goal of creating a robust explanatory model.

The quantitative data are composed of 10-year single name dollar-denominated sovereign bond spreads quoted at mid-prices (Winckelmann and Sorensen 2011). The unit of analysis is the state-quarter year. They are chosen because they have been studied the most (Dieckmann and Plank 2011 and Winckelmann and Sorensen 2011). The thesis will only report the results for 10-year spreads. The sample period extends from January 1, 2007 to December 31, 2013. This period covers the period before and during the financial crisis as well as the sovereign debt crisis and resulting austerity measures. The period is further divided into two sub-periods. Period 1 is
defined as January 1, 2007 to December 31, 2008. Period 2 is defined as January 1, 2009 to December 31, 2013.
LITERATURE REVIEW

The literature on austerity has grown in recent times as various parts of the world have experienced economic hardships brought on by the 2008 financial crisis. However, the concept of austerity and the history of its consequences has existed for a longer period of time. It is important to understand austerity’s intellectual beginnings, its application, its repudiation, and subsequent reacceptance. The tergiversating continues to this day with proponents and opponents arguing vociferously over its merits. This literature review also delves into the causes of the financial crisis, the effects of banking deregulation, the role CDOs, CDSs, and securities played leading up to the turmoil, and the economic effects of austerity.

2.1 Austerity's intellectual history

The theory behind austerity is not new. In fact it has existed for hundreds of years. Adam Smith's (1723-1790) magnum opus, The Wealth of Nations, was the genesis of modern economics and the school of classical economics. Smith believed that indebted nations should embrace austerity, which he termed 'the parsimony of the scots'. According to Smith, the combination of national parsimony (austerity) and individual frugality (personal savings) ignites the engine of economic growth. He felt that states were prone to excessive prodigality (spending) that threatened the capitalist engine. Thus Smith laid the foundation for austerity as a moral prerogative.

A student of Adam Smith's works, Jean-Baptiste Say (1767-1832) would later promote free trade and competition as vital to economic growth. Say agreed with Smith's theory of the "invisible hand", which stated that economies move to their natural equilibrium on their own. His contribution to classical economics is Say's Law, which asserts that supply creates its own demand. "A product is no sooner created, than it, from that instant affords a market for other products to the full extent of its own value... As each of us can only purchase the production of
others with his own production - as the value we can buy is equal to the value we can produce, the more men can produce, the more they will purchase" (Say 1803, 55). This statement is the economic equivalent of the assertion 'If you build it, they will come.' According to Say, excessive supply over demand, termed "glut", cannot occur. What happens instead is that demand presents itself in another form.

David Ricardo (1772-1823) equally eschewed the role of government in taxing the populace and imposing restraints on businesses. The fact that Ricardo earned his fortune as speculator on the financial market may have contributed to his liberal economic views. His most famous book, On the Principles of Political Economy and Taxation, delves into the topics of land rents and international trade. He advocated the importance of businesses feeling confident to operate in an environment with limited regulation. Taken as a whole classical economics has three major tenets:

- The free market is self-correcting and naturally reaches full employment equilibrium.
- Government intrusion of the free market will only cause more problems.
- Confidence contributes to economic growth.

It should come as no surprise that classical economists espoused measures that called for limited government intervention while maintaining confidence that the market would heal itself given time. Thus, classical economists’ preferred recipe for slumping economies was to cut government spending in order to create an environment where businesses can grow. The merchant class had to have confidence that their businesses would expand.

2.2 Austerity’s fall from grace and resurrection

Classical economics and its successor, neoclassical economics, remained the preeminent economic theory from the late 18th century to the early 20th century. As such governments followed their policy prescriptions well into the 1930s. However, the Stock Market Crash of 1929 marked the beginning of a severe prolonged economic slump now known as the Great Depression.
The usual classical economic policy prescription of limited government interference and spending cuts failed to alleviate the growing inequalities experienced by many nations during this time. Such failure allowed a new school of economic thought to advocate a new set of policy prescriptions.

John Maynard Keynes published *The General Theory of Employment, Interest and Money* in 1936 at the height of the Great Depression. Keynes advocated for an aggressive government response that directly contradicted previous remedies. His suggestions had two major policy components:

- A reduction in interest rates (monetary policy).
- Government investment in infrastructure (fiscal policy).

First, Keynes suggested that the central bank must lower interest rates for commercial banks. This would signal commercial banks to reduce interest rates for consumers and encourage them to invest and spend. Secondly, the government would simultaneously invest in multiple infrastructure projects. The subsequent rise in employment and spending would inject money back into the economy and stimulate economic growth. The resulting deficits would be offset by improved economic output.

Contrary to Adam Smith’s assertions, Keynes believed that under certain circumstances savings could lead to hoarding and reduced consumption (Blythe 2013). This decrease in demand leads to what Keynes referred to as the Paradox of Thrift: An increase in savings leads to a decrease in spending (aggregate demand) which in turn leads to lower economic growth and decreased consumption thus lowering total savings. Hence, consumption (not savings) drives investment in an economy. Confidence is a byproduct of a healthy economy, not its source (Blythe 2013). Keynes suggestions were put into practice by America during World War II when the country dramatically increased its war machine spending. The result was a period of American prosperity known as the Golden Age that lasted for decades.
During the 1970s, the United States and other countries again encountered dire economic straits. OPEC had imposed an oil embargo on various developed countries that prolonged a recessionary period already in effect. The stock market crashed in 1973 for the first time since the Great Depression. A combination of high oil prices, high unemployment, and rising inflation led to a new economic phenomenon known as stagflation.

The Keynesian principle of the Phillips Curve - which stated that an economy can either have high unemployment or high inflation but not both – was proven wrong. Certain Keynesian policy prescriptions only exasperated the problem; stimulating the economy could lead to a price/wage spiral. Raising interest rates had a nominal effect on rising inflation. A new school of economic thought entered to solve the problem.

Milton Friedman argued for tightly controlling the state's money supply in order to help stabilize the economy. According to Friedman, excess money supply by the central bank causes inflation. Conversely, insufficient money supplies causes deflationary spirals. His policy prescriptions - later known as monetarism - helped the country exit the recession in 1984 and ushered a new era of respect for conservative economic policies.
2.3 The great debate

Since then, new theories have risen to explain economic phenomena. Nonetheless, classical economics continues to influence researchers to this day. Two papers that have advocated for austerity measures during recessions in modern times are "Growth in a Time of Debt" by economists Carmen Reinhart and Kenneth Rogoff (2010) and "Large changes in fiscal policy: taxes versus spending" by Alberto Alesina and Silvia Ardagna (2009).

Reinhart and Rogoff analyzed 44 countries spanning approximately two centuries of data on government debt, inflation, and growth. "Growth in a Time of Debt" argues that government debt above certain thresholds can have a negative effect on the economy. Reinhart and Rogoff suggest that the banking boom/bust cycle caused the rise in sovereign debt. Sovereigns then had to take a number of steps to help their ailing economies: transferring toxic bank debt to their (the country's) own sheets, adopting stimulus packages, and lowering public sector spending. The result was that governments were straddled with high public debt even as their revenues continued to shrink. The resulting soaring debt levels thus dampened economic growth:

Our main finding is that across both advanced countries and emerging markets, high debt/GDP levels (90 percent and above) are associated with notably lower growth outcomes. Much lower levels of external debt/GDP (60 percent) are associated with adverse outcomes for emerging market growth. Seldom do countries "grow" their way out of debts (Reinhart and Rogoff 2010, 12).

The implications of the study are clear: Governments should lower debt levels at all costs. Their conclusions meld well with Alberto Alesina and Silvia Ardagna's study on the most effective forms of fiscal stimuli on the economy. Their study finds that spending cuts and tax cuts are the most effective means by which a country can recover from a sagging economy. Alesina and Ardagna acknowledge that their conclusions are controversial and politically charged. Thus, the crux of the analysis centers on the role of government in mitigating the effects of a prolonged recession. The authors concede that large debt-to-GDP ratios can be significantly reduced by
sustained economic growth, such in the cases of America after WWII and the economic boom of the nineties. However, they predict that a sustained economic spurt after the financial crisis of 2008 is unlikely to happen.

Both studies have since been subject to intense scrutiny. Reinhart and Rogoff made their data available to a doctoral candidate named Thomas Herndon. Herndon, with his colleagues Ash and Pollin, found methodological flaws in the paper. "While using RR's working spreadsheet, we identified coding errors, selective exclusion of available data, and unconventional weighting of summary statistics" (Herndon, Ash, and Pollin 2013, 14). Furthermore, Herndon and his colleagues found that Reinhart and Rogoff purposely omitted countries that demonstrated high growth levels despite high debt immediately after World War II. Herndon et al. conclude that the multiple errors in the study render the Reinhart and Rogoff paper irrelevant (Jay 2013). Similarly, the IMF (2011) published a paper that strongly contradicts the evidence put forth by Alesina and Ardagna. The IMF criticized how Alesina and Ardagna defined periods of fiscal adjustment through the cyclically adjusted primary fiscal balance (CAPB). Instead, the IMF recommended analyzing a country's records for tax hikes or spending cuts which ties fiscal adjustment to intent (Economist 2010). The studies unwittingly demonstrate flaws in the empirical and theoretical components of austerity.

After the 2008 financial crisis experts have advocated for Keynesian-style solutions for the current economic downturn. Paul Krugman's *End This Depression Now* and Mark Blythe's *Austerity: A History of a Dangerous Idea* articulate how austerity measures inflict more damage to an already battered economy. Their proposed solutions are textbook Keynesian talking points:

- Lower the interest rate.
- Stimulate the economy through infrastructure projects.
They also criticize conservative economists for proposing ideas that have failed in the past and continue to fail in the current economic downturn. Krugman (2012, 59) notes:

Unfortunately, we're not using the knowledge we have, because too many people who matter—politicians, public officials, and the broader class of writers and talkers who define conventional wisdom—have, for a variety of reasons, chosen to forget the lessons of history and the conclusions of several generations' worth of economic analysis, replacing that hard-won knowledge with ideologically and politically convenient prejudices.

Indeed, Krugman's book was written four years after the 2008 financial shock. Nonetheless, EU member countries have imposed harsh austerity measures in order to lower debt and raise confidence. The results are telling: Greece, Spain, and Ireland have unemployment rates hovering over 20 percent and youth unemployment rates at roughly 50 percent.

Why do austerity measures no seem to work? Krugman (2012) reiterates Keynes's dictum that the boom, not the slump, is the time for austerity. The fact is that austerity measures do have a place in economics and policy. That place, however, is not during the middle of a recession. Keynesians subscribe to demand-side economics, which states that the engine of economic growth lies in spending from consumers, businesses, and government. This leads to Krugman's dictum: "Your spending is my income, and my spending is your income. If both of us try to reduce our debt by slashing spending, both of our incomes plunge" (Krugman 2012, 57).

When consumers and businesses start spending less this inevitably leads to lower economic growth. According to Keynesians, if consumers and businesses begin to spend less then it is up to the government to make up for the lack of spending. Blythe concurs with Krugman, "Just as we cannot all hold liquid assets (cash), since that depends upon someone else being willing to hold less-liquid assets (stocks or houses), we cannot all cut our way to growth at the same time... we cannot all be austere at once" (Blythe 2013, 39).
2.4 Causes of the financial crisis

Blythe adds to the austerity literature by identifying the principle cause of the vast accumulated world debt: banking crises. The term "sovereign debt crisis" is a misnomer because it implies out-of-control spending on behalf of governments. Yet with the exception of Greece, all other EU countries and the United States experienced severe banking runs that required that their governments absorb their bank's losses in order to mitigate a full financial meltdown. Banking busts cause sovereign debt crises, not the other way around. Blythe refers to this as the greatest bait and switch in modern history (73).

Ivan T. Berend agrees that over-leveraged banks were the principle cause of the 2008 financial crisis. He goes further, however, by identifying "contemporary capitalism" as the real culprit, i.e. the globalized deregulated or self-regulating, financialized market system1 (Berend 2013). The original banking system worked by a process in which banks acted as intermediaries between lenders and borrowers throughout the life of the loan. The process was called 3-6-3 banking because they would borrow at 3 percent, lend at 6 percent, and call it a day by 3pm (Blythe 2013). Bank operations were thus straightforward and unremarkable.

This changed in the 1980s with the deregulation of the financial industry and the introduction of disintermediation, which was a deregulation policy that allowed companies to bypass banks as intermediaries and loan to each other directly. This in turn gave rise to "shadow banks", which are intermediaries in non-banking industries that provide traditional banking services. These include hedge funds, mortgage companies, insurance companies, and investment banks. Thus a money market mutual fund could lend to a hedge fund and vice versa without the aid of a traditional bank.

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1 Mark Jinkling (2010) cites all the known causes of the financial crisis: imprudent mortgage lending, housing bubble, global imbalances, securitization, lack of transparency and accountability in mortgage finance, rating agencies, mark-to-market accounting, deregulatory legislation, shadow banking system, non-bank runs, off-balance sheet finance, government-mandated subprime lending, failure of risk management systems, financial innovation, complexity, human frailty, bad computer models, excessive leverage, relaxed regulation of leverage, credit default swaps (CDS), over-the-counter derivatives, fragmented regulation, no systemic risk regulator, short-term incentives, tail risk, and black swan theory.
The deregulation of the 1980s also allowed experts to create a new form of financial instrument called a security. Securitization is the process by which the issuer pools various assets into a single instrument (security) and sells it to investors (Blythe 2013). The security can be composed of mortgages, student loans, sovereign debt, etc. that is rated based on the likelihood of the debtors fulfilling their obligations. Investors collect on the payments. Securitization took over the traditional 3-6-3 banking model and forced banks and shadow banks to take a short-term approach to profit making. Thus, banks and shadow banks began emphasizing higher yields on securities as a major source of revenue.

Generally, banks are required to maintain minimal capital requirements that ensure they have enough liquidity on their spreadsheets to cover any losses they incur on their investments. Andrew Whittaker (2014) states that securitized debt instruments allowed banks and other financial institutions to reduce their capital requirements by passing the risk on to investors. As a result, banks began to overleverage themselves by taking on even more debt while lowering their capital reserves. This problem was further magnified by the fact that financial institutions purchased securities amongst themselves. He concludes, "... it became apparent that this diversification of risk holding had not actually been achieved. Instead, most of the holdings, and the vast majority of the losses, were not on the books of end investors, but on the books of highly leveraged banks and bank-like institutions" (2014, 150).

The Gramm-Leach-Bliley Act (GLBA) and the Commodity Futures Modernization Act (CFMA) allowed financial institutions to provide loans to home buyers and to securitize those loans (Mark Jickling 2010). James Crotty faults the "perverse incentives" that induced financial institutions to sell questionable securities because they did not have to pay back their fees if the securities failed to produce income (2008, 565). Thus, mortgage-back securities proved to be hugely profitable. The incentives to pool the loans into sellable assets was so great that companies
began loaning to NINJA (no income, no job, no assets) applicants once there were no more high quality borrowers (Blythe 2013).

Another component to this problem was that companies began to bunch their securities into collateralized debt obligations (CDOs). Collateralized debt obligations are structured financial instruments that purchase and pool financial assets (FCIC, 128). Securities firms then pool various securities into tranches. Riskier CDOs generate a higher rate of return but derive their income stream from borrowers who are more likely to default. Safer CDOs are deemed less risky and so generate a lower yield. In order to avoid correlation, managers and securities firms pooled mortgages from various parts of the country. Hence, a CDO could hold mortgages from Texas, Washington, and New York with the knowledge that a fall in prices or payment failure in one part of the country would not affect the other parts.

Investors and financial institutions alike saw CDOs as assets that posed minimal risks with significant rates of return. The problem lied in the fact that bunching securities from various parts of the country into a single CDO made them correlated. Blythe (2013, 30) explains, "Adding Manhattan to Arizona and Baltimore in a single security made them correlated... What was uncorrelated in theory became extremely correlated in practice". This meant that higher-rated CDOs held more risk than their ratings suggested. When investors figured this out they began to panic. Many investors sought to protect themselves with insurance.

Financial entities created derivatives as an insurance policy against subprime (low quality) borrowers. A derivative is a contract that derives its value from changes in the price of an asset. There are four types of derivatives: futures, forwards, options, and swaps. Companies took swaps and created credit default swaps (CDS). According to Rene M. Stulz (2008, 2) CDSs "are functionally equivalent to default insurance contracts". The purchaser of a CDS insure himself against default of a bond. In return the issuer receives premium payments on a regular basis for underwriting the swap. The market for CDS indices grew quickly with corporates in the U.S.
(CDX North America), Europe (iTraxx Europe), and other parts of the world. All these events led to the greatest financial crisis since the Great Depression.

2.5 European conditionality and measuring austerity

Initially, European governments vowed to employ fiscal stimulus measures to shore up their ailing economies. Countries such as China and the United States also promised to use stimulus tools to shore up their economies. However, the Eurozone abruptly stopped their stimulus programs after a year and began employing austerity measures. Philip Arestis and Theodore Pelagidis (2010) note that the June 2010 G20 summit officially called for an end to stimulus measures and to refocus on sovereign debt. There are two reasons for the about-face. First, Germany (Europe's largest economy) did not want to take any further stimulus measures for fear of runaway inflation. Germany's fears are rooted in the hyperinflation of the 1930s which led to the rise of Hitler and the Nazi party. Second, many European governments held elections that brought in leftist and center-right governments that championed austerity policies and deficit cutting (Blythe 2013).

The Troika\(^2\) imposed conditional measures in order for struggling EMU sovereigns to receive aid. According to Dreher (2009, 333), "Conditionality is the practice of giving financial assistance contingent on the implementation of specific policies". Conditionality comes in two forms: ex-post and ex-ante. Ex-post conditionality requires country to accept a lender’s conditions and agree to carry them out after it receives the aid. Ex-ante conditionality requires a country to accept a lender’s conditions and agree to carry them out before it receives the aid. The IMF and ECB used a combination of ex-ante and ex-post criteria to ensure that ailing sovereigns already in need of financial assistance would agree to employ austerity measures. Afterwards, sovereigns needing more assistance would have to demonstrate that they have already applied austerity measures before receiving more aid.

\(^2\) The Troika is composed of the European Commission, European Central Bank, and the International Monetary Fund.
By 2010 many European nations - particularly the European PIIGS - were employing harsh austerity measures at the insistence of the Troika and Germany. They began to slash government jobs, raise taxes, and curtail social services spending. Furthermore, the struggling EU countries found themselves in a vicious cycle where they had to "sell more bonds at a higher rate of interest to finance a persistently high deficit in their current account" (Arestis and Pelagidis 2010, 56). The result was that European sovereigns were accruing higher deficits even as their economies experienced deeper, more prolonged recessions. As of 2012, the Eurozone has an average unemployment rate of 11.4 percent with Greece and Spain suffering rates of nearly 25 percent. Youth unemployment hovers at 33 percent for the region (Griffith-Jones and Jolly 2013).

There is no doubt that European sovereigns have applied austerity measures. The question now becomes how to measure austerity's effect on the European Union. First, austerity's purpose must be reiterated, "The central intent of such policies is to reduce government spending, pay down public debt, and restore confidence in a country's financial stability" (EU Center 2013, italics mine). Thus any research project that wants to measure austerity's effects must find a proxy for "confidence". One way of measuring confidence is by analyzing the interest a sovereign has to pay to issue a bond. If a government has a healthy economy, then buyers will pay a lower rate because it is perceived as more likely to fulfill its debt obligations. However, if a government is perceived as having a weak economy, then investors will demand a higher interest rate on its bonds because it will be perceived as less likely to pay back its debts. The interest rates on sovereign bonds fluctuate over time as the economy improves or degenerates.

The question then becomes how to ensure that confidence is being affected by internal policies within a sovereign and not by external shocks or other factors. Dieckmann and Plank (2011) recommend creating a series of global, local, and risk variables that react to the bond spread as it moves through time. The global variables include credit market development, liquidity, and global financials. The local variables include the state of local economy, exchange
rate, exposure to the financial system, local financials, foreign exchange reserves, sovereign credit rating, and the public deficit. The risk variables are the LIBOR rate and the VIX index. A time series regression is applied to the analysis. The bond spread acts as the dependent variable and multiple independent variables were inserted to produce a coherent picture of austerity's effect on EU sovereigns.

2.6 Summary

The causes of the financial crisis and the ensuing use of austerity require a deep understanding of history, economics, finance, public policy, and statistical analysis. This thesis provided a basic background of these components. Much more can and has been said on these subjects as they relate to the ongoing crisis occurring in Europe.

The literature demonstrates that banks caused the financial crisis and, due to their deeply entrenched parasitic relationship with the state, had to be bailed out. The states absorbed the bank's losses unto their spreadsheets and found themselves saddled with massive debt. Following the “wisdom” of technocrats and institutional leaders, struggling European sovereigns imposed austerity measures to reign in their debt. The results have been higher debt levels, higher rates of unemployment, and shrinking revenues. The history of austerity – particularly its application and failure during the Great Depression – was forgotten or willfully ignored. The practice of austerity has a tarnished record. Influential papers advocating for expansionary austerity have been discredited. However, the history of austerity may have little correlation with its future. Statistical models will be needed in order to lend more weight to the primary argument of this thesis. Next, this study will explain in further detail the hypotheses and theoretical determinants.
HYPOTHESIS AND VARIABLES

This chapter discusses contending economic theoretical perspectives that affect our expectations of the effectiveness of austerity measures. I expect to find that bond spreads act as a proxy for how markets respond to austerity measures as a sign of risk and economic health. The growing importance of sovereign bond spreads demonstrates the need to understand what factors are causing fluctuations in world markets (Winckelmann and Sørensen 2011). First, this section will describe two competing economic theories, demand versus supply and how they relate to the principle guiding austerity. Examples of austerity measures are also presented along with their immediate results. Next, I propose the hypotheses and expected results concerning the movement of bond spreads as an indicator of confidence. This study will also describe and distinguish between variables that reflect market conditions and those that are influenced by austerity measures. The aim of this section is to examine the economic and political factors that are influencing bond spreads.

3.1 Demand versus supply

The theory that economies are driven by demand – by both individuals and businesses – is called demand-side economics. David Brin (2009, 2) describes it as the following:

This theory holds that economic activity is driven by demand for goods and services. Moreover, money is in the hand so the middle and lower classes has greater inherent VELOCITY – meaning that a given dollar will be spent and then re-spent more often, if the middle class is passing it around with sequential purchases, than if it is stockpiled in a rich person's portfolio.

The Encyclopedia Britannica (online edition) describes it thusly, “Keynesians maintain that employers will not employ workers to produce goods that cannot be sold... they [Keynesians] believe unemployment results from an insufficient demand for goods and services.” In other words, the economy grows because people and businesses have money and are willing to spend it.
Consumption drives investment. Money has to move from consumer to seller to supplier to producer etc.

Interestingly, there is a concept that says that money has to move in order to create prosperity. Margaret Atwood (2014) explains that the word currency is derived from the word current, which suggests that people long ago understood that money had to flow continuously in order for societies to prosper, "Currency is called 'currency' for a reason: it has to circulate. When you block the circulation you get a stagnant state of affairs" (Newstatesman 2014). This applies to ancient stories as well. According to Atwood, the age-old tale of the dragon pillaging villages for gold and then hoarding it in a cave and aggressively attacking anyone who would dare steal its treasure is in fact an economics lesson in monetary circulation. The dragon does not cause damage by burning villagers or eating them but by taking away their ability to invest and spend. A depression occurs as a result. It is only when the heroes slay the dragon and return the gold to the community that the inhabitants are able to prosper again. The best example of government spending as a catalyst for economic growth is America's entrance into World War II. Although World War II is an anomaly in history, it affords us economic lessons that are applicable today.

The Japanese surprise attack on Pearl Harbor in December 7, 1941 initiated America's economic mobility. Japan had already taken over parts of East Asia and Germany had taken control over a sizable portion of Europe. The United States began to prep itself for a war on both fronts. This would require a massive investment in vehicles, equipment, armaments, and personnel. "If you actually look at what took us out of the Great Depression," Krugman explains, "It was Europe's entry into World War II and the U.S. buildup that began in advance" (MSNBC 2012). It is generally agreed that a major component of America's exit from the Great Depression and entrance into an economic golden age was its war spending during World War II. Chantrill puts America's war spending into perspective, "Defense spending in the United States has fluctuated in the last century, rising from one percent of GDP, peaking at 41 percent in World
War II, declining from 10 percent in the Cold War to five percent today” (usgovernmentspending.com). The massive increase in military spending put millions of men and women to work. More than 10 million men were drafted into the military and millions of men and women on the home front began working in arms factories and munitions depots (Higgins 2001).

All that government spending created wealth by putting money into the pockets of ordinary citizens and creating profits for companies. Krugman (2012, 23) elaborates, “As military spending created jobs and family incomes rose, consumer spending also picked up (it would eventually be restrained by rationing, but that came later). As businesses saw their sales growing, they also responded by ramping up spending.” But did it matter that the government spent money for defense purposes? After all, soldiers perform a vital task in safeguarding national interests, but it can be argued that their work is - as Adam Smith described it - unproductive labor. “In economic terms, not at all: spending creates demand, whatever it’s for,” Krugman (2012, 23) replies. Indeed, a paper released by the U.S. Department of State says that “pent-up consumer demand fueled exceptionally strong economic growth in the post-war period. The automobile industry successfully converted back to producing cars, and new industries such as aviation and electronics grew by leaps and bounds.” The economy grew because demand for products and services rose.

Critics of demand-side economics many times adhere to supply-side economics. Supply-side economics is seen as the yin to demand-side economics yang. Amadeo (useconomy.about.com 2014) describes supply-side economics as the theory that “states general tax cuts, to businesses and workers, will translate to increased economic growth. Businesses will invest... but workers will also spend the extra cash, further stimulating demand.” The theory that tax cuts raise revenues because businesses and individuals will be induced to spend more gained traction in the 1980s. Trickle-down economics - a subset of supply-side economics- goes further by stating that providing tax cuts for the wealthy and for business owners will provide them incentives to spend
and invest more. The spending brought on by the elite class “trickles down” by creating more jobs and more spending. Does this theory work? We can explore the case of Kansas as an illustration of the debate over austerity and related economic theories.

3.2 Tax cuts and austerity, Kansas style

In January 12, 2011 Sam Brownback won the race to become the Republican governor of Kansas. Brownback set out to apply the trickle-down playbook, which he dubbed an “experiment”, by resetting “our tax code, particularly with an eye toward lowering income tax rates” (Kansas City Star 2011). He cut the individual income tax, especially for high earners. He also reduced businesses taxes and lowered the state income tax. Exemptions, deductions, and income tax credits were removed (Salon 2014). The only tax increase was in the form of a sales tax (Politico 2014). The Kansas City Star reports that Brownback cut taxes to a total of $1.1 billion! What are the results of the tax cuts after two years? The Washington Post’s editorial title sums it up: *Sam Brownback’s failed ‘experiment’ puts state on path to penury.* The article reports:

Mr. Brownback’s Kansas trial is rapidly becoming a cautionary tale for conservative governors elsewhere who have blithely peddled the theology of tax cuts as a painless panacea for sluggish growth... Moody’s cut Kansas’s credit rating last spring, and Standard & Poor’s followed suit last month... spending reductions have been sufficiently draconian and divisive that large numbers of Kansans have expressed alarm... non-partisan budget analysts for the state legislature project that without new sources of revenue or even deeper spending cuts, the state faces some $1.3 billion in deficits in the coming five years.

The tax cuts did not work because, according to a study conducted by Owen M. Zidar, tax cuts for the rich were statistically insignificant (SSRN 2014). This is due in part because top marginal tax rates are so low. From 1940 to 1980, “the top marginal tax rate was 70 percent or higher” (New York Times 2012). The top rate today is only 35 percent. A self-professed ‘job creator’ who owns a graphic design business elaborates, "Business owners like me create more jobs when we need more employees to meet the demand for goods and services our businesses provide. And we deduct employee costs from our taxable income. So demand is the key to job creation –
not tax cuts” (Pittsburgh Post-Gazette 2012). Indeed, the same business owner cites data pointing out that only 3 percent of taxpayers with businesses have incomes above $250,000 which includes corporate CEOs and hedge fund managers.

One more important fact to note is that the one tax increase that Governor Brownback did implement was the sales tax. This is very telling. According to the Institute on Taxation and Economic Policy, sales taxes tend to affect the most vulnerable members of society more. This is because sales taxes are a form of regressive tax, which requires the middle-income and poor to pay a larger portion of their incomes in taxes than the rich. The same study notes that states with the most regressive tax structures make “the bottom 20 percent pay up to seven times as much of their income in taxes as their wealthy counterparts” (2005, 1). As an example, a family of four earning $25,000 will pay more in taxes for basic necessities such as food and clothing than a family of four earning $500,000.

The tax breaks Brownback put into law created more wealth for top earners at the expense of the poor and middle-class. They also created a large fiscal deficit that threw the state’s budget into free fall. Kansas now has a budget deficit of over a billion dollars. Due to this harsh reality, Kansas’s governor proposed raising taxes on liquor and cigarettes (Politico 2014). Again, note how the governor’s solution is not to raise taxes on top earners but instead on so-called sin taxes, disproportionately affecting lower-income individuals. Furthermore, governor Brownback enacted drastic austerity measures by reducing welfare spending and education spending (Wichita Eagle 2014). The result has been nothing short of disastrous. Kari Rinker details that the poor and children were disproportionately affected by the austerity measures: children entering foster care is rising, adoptions are at their lowest point in several years, welfare benefits have been reduced, and cash assistance has been cut by nearly half (RHRealityCheck.org 2014.)
Although a case study can show the effects of austerity, it is still important to produce analyses that can corroborate or refute them. This study will state the hypotheses and theoretical determinants that will be used to create an explanatory model by using bonds as a proxy indicator of economic performance before and after austerity measures are implemented.

3.3 Hypotheses

The bond spreads are investigated from the period leading up to the financial crisis through the sovereign debt crisis up to the period that austerity measures are implemented. This period stretches from January 2007 to December 2013. Furthermore, this period is divided into 2 sub-periods in order to attain a more nuanced understanding of their determining factors. The main focus of this thesis is to determine how austerity measures affect European countries by identifying the determinants of sovereign bond spreads and comparing the results across different time periods. A higher bond interest (spread) is a sign of higher risk signaling unease with the economic performance of a state. This implies that austerity is not working.

The hypotheses are as follows:

H1: Austerity measures will not significantly raise investor confidence.

H2: Austerity measures will cause bond spreads to rise signaling a loss of investor confidence.

H1 is essentially a null hypothesis that is expected to be correct. I derive my expectations from the literature review and the Kansas case. The literature shows a weak link between austerity and improved investor confidence. Indeed, various journalistic sources describe the rocky relationship between austerity measures and improved economic performance. The theoretical underpinnings for H1 are derived from Keynesian economics and the works of Krugman (2012) and Blythe (2013). Keynesians subscribe to demand-side economics, which states that the engine of economic growth lies in spending from consumers, businesses, and government. The fact is that austerity measures do have a place in economics and policy. That place, however,
is not during the middle of a recession. According to Keynesians, austerity measures should be applied during periods of strong economic growth when the government, private sector, and the general population can off-set spending cuts. When the economy is in recession, someone (government, businesses, consumers) still has to spend to keep the economic engine running. The problem is exasperated when all three entities try to cut costs and save more at the same time. This leads to Krugman's dictum: "Your spending is my income, and my spending is your income. If both of us try to reduce our debt by slashing spending, both of our incomes plunge" (Krugman 2012, 57).

When consumers and businesses start spending less this inevitably leads to lower economic growth. Keynesians argue that it is up to the government to make up for the lack of spending. Blythe concurs with Krugman, "Just as we cannot all hold liquid assets (cash), since that depends upon someone else being willing to hold less-liquid assets (stocks or houses), we cannot all cut our way to growth at the same time... we cannot all be austere at once" (Blythe 2013, 39). To reiterate, the government should spend more during recessions to off-set reduced spending from businesses and consumers.

The theoretical argument for H2 is derived from Blythe’s (2013, 197) statement, "You can't run a gold standard in a democracy." Blythe argues that the Eurozone, composed of nineteen countries that share the same currency, is a modern-day gold standard. The gold standard was an experiment that countries adopted during the nineteenth century and again after World War I. The experiment consisted of various countries agreeing to share gold as a common currency in response to the so-called fiat problem. The problem lay in the fact that after countries adopted a single currency they were no longer able to inflate or devalue their currencies when economic problems occurred. Their only options were to deflate (impose austerity measures) or default on their debts. Since default was not considered a real option, the only action struggling countries could take was to impose austerity. Governments would slash wages and raise taxes in order to
pay down their debts. The crux of the matter lied in the fact that the general populace would protest more with each round of austerity until the government was overthrown. Thus, the problem of austerity is ultimately a political one. The citizenry can only take so much austerity before they demand a radical change in their government. This study assumes that investors will examine the increasing political unrest in countries that have imposed austerity measures and demand higher bond yields as a result.

3.4 Theoretical determinants

This study examines several independent variables that seek to explain markets, but it is expected that many of these are highly correlated with each other. As a result, some variables will be removed from the final model presented. The principal objective of this section is to select the economic and political variables that will be used in the regression model. The fact is that there are many variables that can have an effect on bond spreads. Therefore, researching scholarly papers from authors who have previously written on the subject will provide guidance on how to best structure the analysis. Credit default swaps have existed for a short period of time and articles on it are limited. Bonds and the study of bond spreads have existed for a longer time period. For this reason, the study will use bond spreads in the analysis. This section will use a model framework created by Longstaff et al. (2007) and modified by Winckelmann and Sorensen (2011), which identifies market-determined variables and structures them as global, local or risk factors.

3.4.1 Dependent variable, bond spreads

Bonds are “fixed-income assets – essentially IOUs that promise the holder a specified set of payments” (Clifford Smith 2008). The interest rate on the bond, or “spread”, demonstrates what investors feel about the economic health of the country. A low interest rate on the bond indicates that investors feel confident that the sovereign will pay back its debt. A higher interest rate
indicates that investors feel less confident that the sovereign will pay back its debt and so require a higher yield. Thus, bond spreads make good proxies for the perceived financial state (confidence) of a nation. If austerity works we should see interest rates drop. The rest of the section discusses the independent variables based on the study of Dieckmann and Plank and other studies. The data are obtained from the Federal Reserve.

3.4.2 Global factors

Market events that develop in one part of the world have the ability to affect economies in other parts of the world. This occurs because of the growing interdependence between nations prompted by advances in technology - i.e. globalization. An example of a global factor affecting spreads is the collapse of Lehman Brothers in 2008 which led to plummeting financial markets in stock indexes throughout the world.

3.4.2.1 Federal Funds, Liquidity

According to the Federal Reserve, the federal funds rate is "the central interest rate in the U.S. financial market. It influences other interest rates such as the prime rate, which is the rate banks charge their customers with higher credit ratings." Thus, the federal funds rate is closely observed by market watchers, including other national banks. The federal funds rate is also linked to the liquidity in the US market by either selling or buying bonds, which directly affects the federal funds rate. Benkert (2004) included a liquidity variable in his model by measuring the difference between the 3-month USD interest rate swap and Treasury yield. The variable itself, $Liq_{it}$ contained no explanatory power for CDS spreads. The sign of this variable is expected to be positive. Data for this variable are obtained from the Federal Reserve.

3.4.2.2 Short-term interest rate, Euro

In capital asset pricing models, the risk free rate is defined as "the compensation for systematic risk that cannot be eliminated by holding a diversified portfolio" (Investopedia). Thus any additional risk incorporated by the investor is expected to be rewarded with a higher rate of
return. Since in practice all investments carry minute amounts of risk, the interest rate is tied to
the three-month LIBOR Euro, $int_{\text{Euro}}$. The regression analyzes only European Union member
states and therefore requires a Euro-centric variable. Winckelmann and Sorensen (2011) created
this variable because they noticed that the development of swap rates began to differ between the
short and long-maturities. The information is obtained from the Federal Reserve.

3.4.2.3 Short-term interest rate, Dollar

The risk free rate is defined as "the compensation for systematic risk which cannot be
eliminated by holding a diversified portfolio" (Investopedia). This variable is similar to the
LIBOR Euro variable, but it uses the short-term interest rate for the dollar, $int_{\text{Dol}}$. The chosen
proxy is added to determine if there are any differences between the short-term interest rate
movements for the Dollar as opposed to the Euro. The data are obtained from the Federal
Reserve.

3.4.2.4 Global financials

Winckelmann and Sorensen (2011) added the MSCI World Financials index to see how
the state of the world economy could affect spreads. Nonetheless, they found that the World
Financials index and the S&P 500 were highly correlated. To solve this problem, this analysis
will use the S&P 500 index and disregard the MSCI World Financials index. The S&P 500
provides more explanatory power. The global financial system variable, $GloFin_{\text{is}}$ is included in
order to capture the stature of global finance. In examining the volatility spillover effects in the
Pacific-Basin market, Angela Ng (2000) finds that shocks occurring in other parts of the world
affect regional and local markets. Hence, a downturn in the global financial system is expected to
have a negative effect on the local economy which leads to higher spreads. The expected
coefficient is negative. The information is obtained from the Federal Reserve.
### 3.4.3 Local Factors

As the sovereign debt crisis continues in Europe there are various local economic factors that may affect the CDS and bond spreads. Indeed, after the collapse of Lehman Brothers the expected findings are that local factors will become major contributors to the continued debt crisis. The following variables are included in the regression analysis to capture information about the local economy.

#### 3.4.3.1 Net debt ratio

This variable will use a ratio to calculate the financial leverage of a sovereign as related to its ability to meet financial obligations. This variable is useful to gauge whether austerity may be working or not. Winckelmann and Sorensen (2011) warn against solely focusing on government debt since it could be an indication of a growing economy. Instead, they recommend including economic productivity as a measure of a country's indebtedness. The variable formed is the net debt ratio $\text{net/debt}_{it}$ construed as the difference between a government’s assets and debt as a percentage of gross domestic product. A higher ratio is expected to lower the sovereign credit quality since it suggests added difficulties with servicing the debt. Furthermore, a lower ratio should correlate with higher yield spreads in CDS and bonds. The expected coefficient is negative. The information is obtained from Eurostat.

#### 3.4.3.2 Exchange rate

The variable $\text{exrate}_{it}$ is included in the analysis. The variable measures the local exchange rate against the US dollar and checks for appreciation or depreciation. Including the variable in the regression analysis should give an indication on the state of health of the local economy. Liu and Morley (2011, 17) say that "Although this varies between countries depending on their exchange rate regime, there is evidence that the exchange rate has a determining effect on CDS spreads and some evidence of causality in the other direction." Specifically, they found that investors may look at exchange rate movements in relation to a country's currency in order to
gauge risk premia. The variable is expected to have a negative coefficient for bond spreads since an appreciation of the local exchange rate against the dollar would indicate a strengthening economy. The data are obtained from the Federal Reserve.

3.4.3.3 Reserve assets

Dieckmann and Plank (2011, 4) observe that "if a country has outstanding foreign currency debt issued in a permitted currency, these bonds are considered to be deliverable obligations." The opposite is also true, a sovereign that holds a minimal amount of foreign currency reserves will be deemed unable to meet its obligations. Credit rating agencies also look at a country's foreign reserves when evaluating their rating. The proxy $FXres_{it}$ is created by taking the ratio between the country's foreign exchange reserves and GDP. The information is obtained from Eurostat.

3.4.3.4 Debt/GDP

The term debt-to-GDP ratio is the ratio between a sovereign's government debt and its GDP. A low debt-to-GDP ratio indicates an economy that is producing more and borrowing less. A high debt-to-GDP ratio indicates an economy that is producing less and borrowing more, thus raising its debt levels. Euro zone countries incurred more debt when they rescued their banking institutions. The variable $debtGDP_{it}$ is created to capture the amount of a country's debt relative to its GDP. The data are obtained from Eurostat and is expected to have a positive coefficient.

3.4.3.5 GDP

The OECD defines GDP as "an aggregate measure of production equal to the sum of the gross values added of all resident, institutional units engaged in production (plus any taxes, and minus any subsidies, on products not included in the value of their outputs)." GDP as a measurement is measured in billions of euros. The variable $GDP_{it}$ is created to capture the size of the economy. The data are obtained from the Federal Reserve and is expected to have a negative
The variable EuroShares is derived from the Federal Reserve unit, Total Share Prices for All Shares for the Euro Area. The share prices indicate the strength of the European Union stock markets. Similar to the GDP variable, the EuroShares variable captures a broad portion of the local economy with little nuance. However, the direction of the \( \text{shares}_{it} \) variable can indicate whether a country's economy is healing or not. The data are obtained from the Federal Reserve and is expected to have a negative coefficient.

### 3.4.4 Risk factors

Winckelmann and Sorensen (2011) state that the volatility of a country's assets are important. They argue that "a higher volatility means a higher probability of exercise, which means an increase in the probability of default. Hence, an increasing volatility means a higher spread" (2011, 29). Zhang et al (2005) confirm this by finding that volatility risk alone accounts for 50 percent of the CDS spread variation. The explanatory power of volatility risk jumps to 77 percent when other variables such as credit rating and macroeconomic conditions are controlled for. Thus, one or more variables should be included to capture equity volatility. The first volatility variable \( \text{VIX}_{it} \) is derived from VIX index which measures the implied risk in the S&P 500 by weighing various prices for multiple options. The second volatility variable is \( \text{vix}_{DJIA_{it}} \) which measures the rate weekly rate of change within the Dow Jones Industrial Average. The data are obtained from Nordea Analytics. All the variables are compiled into one regression model which for bond spreads is:

\[
\text{Bond}_{it} = \beta_0 + \beta_1 \text{liq}_{it} + \beta_2 \text{intEuro}_{it} + \beta_3 \text{intDol}_{it} + \beta_4 \text{GloFin}_{it} + \\
\beta_5 \text{netGDP}_{it} + \beta_6 \text{exrate}_{it} + \beta_7 \text{FXres}_{it} + \beta_8 \text{debtGDP}_{it} + \beta_9 \text{GDP}_{it} + \\
\beta_{10} \text{shares}_{it} + \beta_{11} \text{VIX}_{it} + \beta_{12} \text{vix}_{DJIA} + \epsilon
\]
and adding a bond lag

\[ Bond_{it} = \beta_0 + Bond_{lag} + \beta_1 liq_{it} + \beta_2 int_{Euro_{it}} + \beta_3 int_{Dol_{it}} + \beta_4 int_{GloFin_{it}} \]
\[ + \beta_5 net_{GDP_{it}} + \beta_6 exrate_{it} + \beta_7 FXres_{it} + \beta_8 debt_{GDP_{it}} \]
\[ + \beta_9 GDP_{it} + \beta_{10} shares_{it} + \beta_{11} VIX_{it} + \beta_{12} vix_{DJIA} \]
REGRESSION ASSUMPTIONS AND RESULTS

This analysis follows the work of other researchers by analyzing the driving forces of bond spreads in the European Union. Bond spreads act as a proxy for investor confidence in EMU countries. This thesis analyzes the determinants of sovereign bond spreads by dividing the variables into global, local, and risk factors. This section postulates that Period 1 will be dominated by global and risk variables indicating a global financial shock. Period 2 will be dominated by local variables indicating that bond spreads are caused by intra-country policies. The bond spreads are investigated from the period leading up to the financial crisis through the sovereign debt crisis up to the period that austerity measures are implemented. This period stretches from January 2007 to December 2013 and is divided into two sub-periods in order to obtain a more nuanced understanding of their determining factors.

The regression analysis is carried out using a backward elimination procedure. Variables that are highly correlated with one another above .07 are excluded from the analysis. Insignificant variables are also excluded. If the final model exhibits 1) notably large standard errors and/or 2) unexpected signs of the coefficients, then the regression model is examined in further detail.

4.1 Regression assumptions

Due to the nature of the data, this paper uses a PCSE model to measure the determinants of sovereign bond spreads across periods of time. All regressions use an AR1 process. The structure of the data produces a time-series cross-section (TSCS). The temporal and spatial properties of TSCS data makes traditional regression techniques such as OLS or GLS problematic. Moreover, serial correlation and heteroskedasticity also present problems in regression analyses with a time component. In order to solve this problem, Beck and Katz (1995) created a regression technique that takes into account the complexity of the error process, but in
a way that does not ask too much of the data” (Kristensen and Wawro 2003, 2). Beck and Katz (1995) determine that a preferable way to handle error terms is by estimating the coefficients by OLS and then computing PCSEs. The panel corrected standard errors are obtained as the square roots of the diagonal elements of the matrix:

$$ \text{cov}(b) = (X'X)^{-1}(X'(\Phi \otimes I_T)X)(X'X)^{-1} $$

where $\Phi$ is an N x N matrix with the $(i,j)$th element estimated by:

$$ \left( \sum_{t=1}^{T} \hat{e}_{i,t} \hat{e}_{j,t} \right) / T $$

4.2 Regression Results

A number of explanatory variables were highly correlated with one another (above .07) indicating multicollinearity. The global variables that were highly correlated were the 3-month intDol and the 3-month intEuro variables. As a result, the 3-month intDol was dropped from the regression. The 3-month intEuro variables was found to contain slightly higher explanatory power than intDol. intDol and intEuro may have demonstrated such high levels of collinearity because they are watched by investors globally and affect one another in prices. Thus, a rise in the short-term LIBOR Euro rate (intEuro) causes a rise in the short-term dollar rate (intDol). The liq variable was also found to correlate strongly with intEuro and intDol. The short-term federal interest rate mirrored the London-based short-term interest rate under LIBOR. Thus, liq was also removed from the regression analysis.

The local variables that were highly correlated were debtGDP and FXres above the .07 threshold. This could be due to the fact that the debtGDP variable analyzes information similar to FXres. The debtGDP variable measures the difference between a sovereign's government debt and its GDP while the FXres variable measures a country's foreign reserves, with higher reserves indicating an economy more capable of meeting its debt obligations. In light of this, FXres is
removed from the regression. Interestingly, $\text{debt/GDP}$ and $\text{net/GDP}$ were not significantly correlated. Both risk variables, $\text{VIX}$ and $\text{vix/DJIA}$, showed high degrees of co-movement above the .09 level. Studies have shown that stock markets strongly correlate with one another. This is true for major world markets in general. This analysis removed the $\text{vix/DJIA}$ variable entirely. The resulting variables are left to create the most parsimonious regression model possible.

### 4.2.1 Bond spreads, Period 1- Early systemic outbreak

The observation time frame for period 1 extends from Q1 2007 TO Q4 2008. Estimates are in Table 4.1. The period encompasses the build up to the financial crisis, which began in mid-September 2008 and ends December 31, 2008. It is important to look at period 1 because the expected findings state that bond spread movement (a proxy for confidence) will be dominated by global and risk factors. Bond spreads should move because of global shocks and not due to intra-country policies. The number of observations is 44, above the 30 minimum threshold needed for a standard regression analysis but still a low number. This may be due in part to the nature of PCSE models, which Beck and Katz (1995) say tend to eat observations.

The global variable, $\text{intEuro}$, produces a coefficient of .87 at the .01 level. This means that a rise in short-term interest rates -measured in points- also causes bond rates to rise. Rising rates on the euro should raise bond rates. $\text{net/GDP}$ is construed as the difference between a government’s assets and its debt. A higher net-debt ratio means that a sovereign has more assets relative to its debt. The $\text{net/GDP}$ variable produces significance with a coefficient of -1.02 at the 1% level. This reveals a negative relationship in which higher overall assets relative to debt leads to lower bond rates, again producing expected results. These aggregated data show that lower bond returns relate to those states less prone to a financial crisis. Lastly, the risk variable $\text{VIX}$ produced significance at the 5% level with a coefficient of -.02 percentage points. As a result, rising volatility rates lower bond spreads. This result is counterintuitive because higher volatility points should coincide with higher bond spreads. The relatively small significance of the risk
variable, which weighs the various prices for multiple options, may stem from the fact that the global variable \( intEuro \) already took risk into effect. Indeed, some studies use the \( VIX \) variable as a global variable instead of risk variable.

Table 4.1: PCSE of Bond Spreads

<table>
<thead>
<tr>
<th>Bond (bond spreads)</th>
<th>Period 1</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coef.</td>
<td>Err.</td>
<td>z</td>
<td>Coef.</td>
<td>Err.</td>
<td>z</td>
</tr>
<tr>
<td><em>GloFin</em></td>
<td>-0.00</td>
<td>0.00</td>
<td>-1.12</td>
<td>0.00</td>
<td>0.00</td>
<td>1.46</td>
</tr>
<tr>
<td><em>intEuro</em></td>
<td>0.87</td>
<td>0.25</td>
<td>3.44</td>
<td>1.08</td>
<td>0.24</td>
<td>4.40</td>
</tr>
<tr>
<td><em>GDP</em></td>
<td>-0.00</td>
<td>0.00</td>
<td>-0.27</td>
<td>-0.05</td>
<td>0.01</td>
<td>-2.95</td>
</tr>
<tr>
<td><em>debtGDP</em></td>
<td>-0.00</td>
<td>0.00</td>
<td>-0.56</td>
<td>0.00</td>
<td>0.00</td>
<td>2.17</td>
</tr>
<tr>
<td><em>netGDP</em></td>
<td>-1.02</td>
<td>2.66</td>
<td>-3.84</td>
<td>-3.53</td>
<td>9.33</td>
<td>-3.79</td>
</tr>
<tr>
<td><em>exrate</em></td>
<td>-0.41</td>
<td>0.63</td>
<td>-0.66</td>
<td>-0.01</td>
<td>0.02</td>
<td>-0.81</td>
</tr>
<tr>
<td><em>shares</em></td>
<td>2.62</td>
<td>2.67</td>
<td>0.98</td>
<td>-0.00</td>
<td>1.36</td>
<td>-0.01</td>
</tr>
<tr>
<td><em>VIX</em></td>
<td>-0.02</td>
<td>0.01</td>
<td>-1.97</td>
<td>-0.02</td>
<td>0.02</td>
<td>-1.03</td>
</tr>
<tr>
<td><em>cons</em></td>
<td>4.37</td>
<td>1.05</td>
<td>4.13</td>
<td>7.94</td>
<td>2.57</td>
<td>-1.03</td>
</tr>
</tbody>
</table>

| N                   | 44       | 160      | 204      |
| Wald Chi-squared    | 121.11   | 39.44    | 34.07    |
| R-squared           | 0.99     | 0.71     | 0.72     |

Significant P-values in bold (p<.05, p<.01, p<.001)

4.2.2 Bond spreads, Period 2 - Sovereign debt crisis

The observation time frame for period 2 extends from Q1 2009 TO Q4 2013. Estimates are in Table 4.1. The period encompasses the aftermath of the financial crisis up to December 2013. It is important to look at period 2 because the expected findings state that this period will be dominated by local factors, meaning that government policies (particularly austerity) will cause bond spreads to move as opposed to global shocks. The number of observations is 160 with an R squared of .71. The global variable, \( intEuro \), was significant once again. Three local variables demonstrated significance as well, indicating that bond spreads were now being affected more by local factors and less by global events. \( GloFin, exrate, shares \), and \( VIX \) demonstrated insignificance.
*intEuro* is significant at the 1% level with a coefficient of 1.08 points. Similar to period 1, rising short-term interest rates cause bond spreads to rise. The *GDP* variable also demonstrates significance at the 1 percent level with a coefficient of -.05. The coefficient, measured in billions of euros, is small compared to other variables but shows that the interest on bonds falls as GDP rises. As is expected, a rising GDP variable correlates with falling bond rates. The *netGDP* variable also produced a significance level of 1 percent with a coefficient of -3.53 percent of GDP. Again, this result coincides with expectations. A country with more assets relative to debt should quell investor fears. Rising net-debt ratios are accompanied with rising GDP and have the capacity to calm markets. Lastly, the *debtGDP* variable was found significant at the 5 percent level. Yet, *debtGDP* had a coefficient of .00. Winckelmann and Sorensen (2011) also found this variable to have little explanatory power.

### 4.2.3 Bond spreads, Period 1 and Period 2 – Total

The observation time frame for all data points extends from Q1 2007 TO Q4 2013. The estimates are in Table 1. The number of observations is 204 with an R squared of .72. Again, *intEuro* is significant at the 1% level with a coefficient of .34 points, indicating that rising short-term rates cause bond rates to rise. The *GDP* variable also demonstrates significance at the 1% level with a coefficient of -.03, demonstrating that rising GDP causes bond spreads to fall. The *netGDP* variable also produced a significance level of 1% with a coefficient of -3.41 percentage change of GDP, very similar to the coefficient found in Period 2. The rising *netGDP* variable coincides with lower bond interest rates. *VIX* was significant at the 10% level with a coefficient of -.01 percentage points and shows that rising volatility causes falling bond rates. However, the coefficient is so small that it can move in either direction.

The fact that the regression analysis strongly resembles Period 2 stems from the fact that a larger number of data points are in period 2 (160) than period 1 (44). This demonstrates that bond spreads (confidence) respond positively with higher asset-to-debt ratios and growing
economies. It is interesting to note that the risk variable $VIX$ is still significant but continues to have little explanatory power.

4.2.4 Bond spreads lagged, Period 1 - Systemic outbreak

In order to take into account possible autocorrelation, a lag variable was inserted into the second regression model. The $Bondlag$ variable is expected to be highly correlated with the $Bond$ variable. The observation time frame for period 1 extends from Q1 2007 TO Q4 2008. The estimates are in Table 2. The period encompasses the build to the financial crisis, which culminated in mid-September 2008 and ends December 31, 2008. Again, the expected findings state that bond spread movements will be dominated by global and risk factors. The number of observations is 40, four less than the same observation period without the lagged variable. The only significant variable is $VIX$. The risk variable $VIX$ was significant at the 5 percent level with a coefficient of -.05 percentage points. This demonstrates that rising volatility rates lower bond spreads. Once again, the coefficient is so small that it can move in either direction. This finding is similar to the findings in the first analysis.

4.2.5 Bond spreads lagged, Period 2 - Sovereign debt crisis

The observation time frame for period 2 extends from Q1 2009 TO Q4 2013. The period encompasses the aftermath of the financial crisis up to December 2013. The estimates are in Table 2. The number of observations is 160 with an R squared of .93. It is important to note that the R squared will be high because of the lagged dependent variable. $intEuro$ is significant at the 1 percent level with a coefficient of .61 points. $intEuro$ has proven to be a consistent explanatory variable, in part because as a global variable it also captures information at the local level. Two local variables, $exrate$ and $shares$, are also significant. $exrate$ is significant at the 1 percent level with a coefficient of -.05 movement (measured as U.S. dollars to one euro). It is important to note that bond spreads for the Eurozone begin to fall in earnest during the 2012 year. This indicates that a rising exchange rate correlates with falling bond spreads.
Table 4.2: PCSE of Bond Spreads w/lag

<table>
<thead>
<tr>
<th>Bond (bond spreads)</th>
<th>Period 1</th>
<th></th>
<th></th>
<th>Period 2</th>
<th></th>
<th></th>
<th>Total</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coef.</td>
<td>Std. Err.</td>
<td>z</td>
<td>Coef.</td>
<td>Std. Err.</td>
<td>z</td>
<td>Coef.</td>
<td>Std. Err.</td>
<td>z</td>
</tr>
<tr>
<td>Bondlag</td>
<td>0.78</td>
<td>0.18</td>
<td>4.16</td>
<td>0.92</td>
<td>0.04</td>
<td>22.06</td>
<td>0.90</td>
<td>0.04</td>
<td>21.82</td>
</tr>
<tr>
<td>GloFin</td>
<td>-0.00</td>
<td>0.00</td>
<td>-1.18</td>
<td>0.00</td>
<td>0.00</td>
<td>1.16</td>
<td>-0.00</td>
<td>0.00</td>
<td>-1.33</td>
</tr>
<tr>
<td>intEuro</td>
<td>0.36</td>
<td>0.37</td>
<td>0.96</td>
<td>0.61</td>
<td>0.14</td>
<td>4.31</td>
<td>0.05</td>
<td>0.05</td>
<td>0.92</td>
</tr>
<tr>
<td>GDP</td>
<td>0.00</td>
<td>0.00</td>
<td>0.66</td>
<td>0.00</td>
<td>0.01</td>
<td>0.02</td>
<td>-0.00</td>
<td>0.01</td>
<td>-0.30</td>
</tr>
<tr>
<td>debt/GDP</td>
<td>0.00</td>
<td>0.00</td>
<td>0.15</td>
<td>-0.00</td>
<td>0.00</td>
<td>-0.03</td>
<td>-0.00</td>
<td>0.00</td>
<td>-0.52</td>
</tr>
<tr>
<td>net/GDP</td>
<td>-3.32</td>
<td>2.82</td>
<td>-1.18</td>
<td>-1.06</td>
<td>4.91</td>
<td>-0.22</td>
<td>-7.10</td>
<td>3.174</td>
<td>-0.21</td>
</tr>
<tr>
<td>exrate</td>
<td>0.02</td>
<td>0.79</td>
<td>0.04</td>
<td>-0.05</td>
<td>0.01</td>
<td>-3.23</td>
<td>-0.00</td>
<td>0.01</td>
<td>-1.26</td>
</tr>
<tr>
<td>shares</td>
<td>3.55</td>
<td>4.01</td>
<td>0.89</td>
<td>2.98</td>
<td>0.85</td>
<td>3.49</td>
<td>0.30</td>
<td>0.49</td>
<td>0.62</td>
</tr>
<tr>
<td>VIX</td>
<td>-0.05</td>
<td>0.01</td>
<td>-3.41</td>
<td>0.00</td>
<td>0.01</td>
<td>0.20</td>
<td>-0.01</td>
<td>0.00</td>
<td>-1.72</td>
</tr>
<tr>
<td>cons</td>
<td>4.87</td>
<td>1.33</td>
<td>3.65</td>
<td>-3.60</td>
<td>1.93</td>
<td>-1.86</td>
<td>1.18</td>
<td>1.48</td>
<td>0.80</td>
</tr>
</tbody>
</table>

N: 40
Wald Chi-squared: 75.10
R-squared: 0.99

Significant P-values in bold
(p<.05, p<.01, p<.001)

The fact that the euro is falling against the dollar during this time period can indicate that investors are divesting from Europe in general by purchasing less euros and less bonds. Market watchers and investors may have begun to purchase dollars due to its reputation as a safe haven currency. Another explanation is that the ECB began to loan greater amounts of money to struggling EMU sovereigns during this period, which could have quelled investor fears. shares (composed from a basket of European economic indicators) is significant at the 1% level with a coefficient of 2.98 index points. Rising euro shares may cause rising bond spreads because investors are losing confidence in the Eurozone. Period 2 of the second regression analysis shows that local variables have more explanatory power than global variables.

4.4.6 Bond Spreads lagged, Period 1 and Period 2 – Total

The observation time frame for all data points extends from Q1 2007 TO Q4 2013. The number of observations is 200 with an R squared of .85. The only significant variable is VIX. The risk variable VIX was significant at the 10 percent level with a coefficient of -.01. This finding is
similar to the findings for Period 1. The Bondlag variable may be taking away explanatory power from other variables and making the regression model less parsimonious.

4.3 Summary

The regression results confirm the stated expectation that period 1 Table 1, the time measuring early systemic outbreak, would be dominated by global and risk factors. The global variable intEuro was highly significant. The risk variable VIX was less significant but showed that the perception of risk was still a factor during the financial crisis. The local variable netGDP was negatively significant which, correlated with falling interest rates. This could indicate the effects of austerity are being driven by the healthier economies.

The regression results also confirm the stated expectation for period 2 Table 1, during the sovereign debt crisis, that local variables would contain more explanatory power. This indicates that domestic factors are causing bond spreads to move within the country instead of global factors. Three local variables - GDP, debt/GDP, and net/GDP - are significant at the 1 percent level in table 4.1. The net/GDP variable produced a negative coefficient which caused spreads to move downwards after 2012. debt/GDP may have not produced significant coefficients because net/GDP already captured its information. Nonetheless, the GDP variable also produced a negative coefficient that pulled bond spreads lower. Thus a rising net/GDP variable and a rising GDP variable pull bond rates down. intEuro’s strong significance and explanatory power may be due to the fact that, although it is a global variable, it captures information at the local (Euro) level. intEuro has a positive coefficient.

The second regression analysis (Table 2) with the Bondlag variable produced less explanatory results overall but still moved in the direction of the stated hypotheses. Period 1 only had one significant variable with weak explanatory power, VIX. Yet, the fact that the risk variable was significant shows again that the financial crisis caused a fluctuation in bond spreads. Period 2 produced two significant local variables and one global variable. exrate
produced a negative coefficient during the time frame after the financial crisis meaning that markets view a strong euro as a positive development indicating a healthier economy. An increasing exrate correlates with decreasing bond rates. The fact that shares rose while spreads rose can be attributed to other strong Eurozone economies pulling overall European shares in a positive direction. The global variable, intEuro, is also positive which coincides with rising bond rates.

All regression models produced findings similar to those created by Winckelmann and Sorensen. The period directly before and after the financial crisis caused bond spreads to fluctuate due to systemic risk in the global markets. After the shock, some countries found that their banks contained toxic assets and had to be rescued. Other countries had weaknesses in their economies fully exposed and ran the risk of losing investor support.

![Figure 4.1 Source: Federal Reserve](image)

Figure 4.1 shows the bond spreads for all ten EMU countries analyzed. The highest line is Greece, followed by the next highest line, Portugal, and then Ireland. The graph demonstrates that the initial period of austerity, particularly for the PIIGS nations, coincided with rising bond rates. However, bond spreads lower after 2012. At first glance, this appears to indicate that investors are gaining more confidence in the Eurozone. A more plausible explanation is that
investors are purchasing less Eurozone bonds because they are producing smaller yields. Another possible explanation is that the ECB began to provide more loans to struggling EU countries during 2012 which also brought down bond spreads.

Figure 4.2 shows the euro currency fluctuating since 2008 but consistently losing value relative to the dollar. The euro has also gone down in value compared to the dollar since 2008, possibly indicating that investors are pulling away from the euro currency. This shows that falling exchange rates correlate with falling bond spreads, particularly after 2012. The knowledge that the PIIGS countries are still in debt crises may have reduced investor confidence in the euro currency, lowering its value against the dollar. This can also show that investors are divesting from Europe in general by purchasing less euros and less bonds. Market watchers and investors may have begun to purchase dollars due to its reputation as a safe haven currency.

![Figure 4.2 Source: Federal Reserve](image)

Bond rates may also be falling because investors do not want to purchase them due to the danger of default and their low rate of return. Schoen (2015) explains the euro’s fall compared to the dollar:

A country's currency is, in part, a reflection of how well or poorly its economy is doing... Investors also like the relative safety of U.S. Treasuries, which are easily traded and currently pay a higher yield than government bonds issued by other large economies, such as Japan and big European countries... Europe's economy is
also slowing, and inflation is slowing... European investors are also worried that a newly elected Greek government—ushered into office on a pledge to renegotiate crushing debt burden—could revive a debt crisis that shook the euro zone in 2012.

Thus, it does not seem that investors are rewarding Eurozone countries for their austerity measures. Investors may also notice that important economic indicators such as public debt continue at high rates, signaling that EU sovereigns are not improving their economic performance. Figure 4.3 shows the majority of EMU countries are projected to maintain large debts as a percentage of GDP despite their application of austerity measures.

Overall, the regression results and figures demonstrate that EMU economies, particularly the PIIGS, are not showing significant improvement. Bonds are going down, but it does not seem to be due to improved investor confidence and greater investments. If anything, investors may be divesting from European bonds and the euro. The net-debt ratio produced a negative coefficient during this time frame. Paradoxically, bond spreads lower during period 2 but Eurozone states still find themselves weighed with high debt. This can be attributed to the fact that falling debt along with falling GDP still results in over indebtedness. The next chapter will provide more
evidence from news sources to show how austerity measures negatively affect investor confidence and the economies of the countries that implement them.
WHEN PIIGS FLY

This chapter provides an additional examination of Greece, Italy, and Spain by examining how bond markets respond to austerity. Factors relating to the types of policies enacted by each state are discussed along with their political and economic effects. Portugal faces the same problems as Italy, only on a smaller scale. The same is true for Ireland and Spain. Therefore, Portugal and Ireland are excluded from the case studies. The previous chapter produced regression analyses and figures that indicate that EMU countries are struggling economically despite applying austerity measures. Bond spreads may have lowered, but not due to increased investor confidence. The euro has devalued significantly and debt remains very high.

The continuing economic crisis that is adversely affecting Europe’s peripheral countries gives insights into the application and use of austerity. Portugal, Italy, Ireland, Greece, and Spain – known by the derisive moniker PIIGS – have imposed austerity measures on themselves. Yet with the exception of Greece, all other EU countries experienced severe banking runs that required that their governments absorb their bank's losses in order to mitigate a full financial meltdown. Banking busts cause sovereign debt crises, not the other way around (Blythe 2013, italics mine). As the chapter unfolds, the reader will see that none of these countries – with the exception of Greece – were profligate spenders. In fact, countries such as Spain and Ireland entered the financial crisis with low debt levels and budget surpluses.

The problem is further compounded by the fact that the PIIGS countries share a common currency that greatly exacerbates their problems. This chapter will analyze three specific countries: Greece, Spain, and Italy and detail their application of austerity measures and the effects it has had on their economies, debt outlook, politics, and quality of life. The complications of adopting the euro currency are also analyzed as it is a major component to the current economic climate.
The 2008 Financial Crisis that began in the United States caused widespread panic throughout the financial sector, which resulted in the collapse of some companies and large losses for others. The availability of credit declined even as investor confidence continued to deteriorate. In 2009, Greece suffered a credit downgrade that signaled that the financial shock entered European shores. Suddenly, the threat of default by a number of European countries became very real. The European Central Bank produced a number of financial rescue packages meant to shore up the economies of its ailing sovereigns. In return, these countries were expected to enact austerity measures to lower their debt levels and raise investor confidence.

By the year 2000, Greek debt to GDP ratio had hovered over 100 percent for several years. Then Greece adopted the euro in 2001. Greece’s borrowing costs lowered dramatically as a result of adopting the euro. This happened because Germany had also adopted the euro, which had the effect of bestowing all other Euro currency adopters with Germany’s credit (Blythe 2013). In 1994, Greece had to pay 20 percent on a ten-year bond yield. By June 2005, Greek borrowing costs decreased to a record low of 3.21 percent! The sudden influx of cheap money meant that Greece was able to finance investment and consumption in greater proportions, which further widened its deficits to ever increasing margins. But the markets did not seem to mind. After all, the European Central Bank had established itself as the backer of last defense. The ECB had very early established itself as a credible institution that would fight inflation and back all member state’s outstanding debt.

However, Greece had two vulnerabilities that were never addressed during its boom cycle that would come back to haunt it during the 2008 financial crisis. The first problem was Greece’s massive fiscal deficits and expenditures. Although debt in and of itself is not always a bad thing, Greece’s spending was a discombobulated affair rife with misinformation and inter-agency
bureaucratic infighting. Add to that an overly generous social welfare system and the widespread abuse of said system and spending suddenly became difficult to gauge. These weaknesses turned into liabilities by late 2009.

In December of 2009, the three major credit rating agencies Moody's, Standard and Poor's, and Fitch downgraded Greece's credit rating after the finance minister warned of the nation's soaring debt. BBC News reports that the nomenklatura initiated the first round of austerity measures that included a freeze in the salaries of government employees, cuts in public sector pay, pension freezes, and a tax hike on various goods (2010). The markets responded negatively by raising Greece's borrowing costs to over 1000 basis points. Figure 1.1 shows the abrupt hike in Greek bond yields during the first quarter of 2010. As the graph demonstrates, the bond yields rise in earnest at the start of 2010. Thus, Greece paid higher interest rate on its bonds because investors perceive it to be riskier. Figure 5.1 shows Greece’s interest on bonds rising significantly two years after the financial crisis.

![Greek 10yr Bonds](image)

**Figure 5.1** Source: author
Credit rating agencies in April 2010 further downgraded Greece's credit rating. The Troika composed European Union, European Central Bank, and the International Monetary Fund offered the ailing state 110 billion euros on the condition that it impose more austerity measures. Prime Minister Papandreou announced the new measures one month later which led to violent protests and strikes throughout the country. The protests became so violent that three people were killed by smoke and fumes when a “petrol bomb” was thrown at a Marfin bank branch in Athens (BBC News 2010). BBC News reports that the measures included “pension freezes, an increase in sales tax from 19% to 21%, rises in taxes on fuel, cigarettes and alcohol, rises in taxes on luxury goods, cuts in public sector pay” (2010).

In early 2011, the credit rating agencies once again lowered Greece's credit rating followed by another credit downgrade six months later. The credit agency Fitch explained that the downgrade “reflects the scale of the challenge facing Greece in implementing a radical fiscal and structural reform program necessary to secure solvency of the state and the foundations for sustained economic recovery” (The Telegraph 2011). The Greek parliament responded by passing another round of austerity measures that included raising taxes for those earning over 8000 a year, adding a tax for those earning over 12000 a year, increasing the housing industry VAT, and lowering pensions (The Guardian 2011). On June 28, 2011 protesters again took to the streets and violently opposed the package. Prime Minister George Papandreou resigned in late 2011 after Greece suffered another credit downgrade and investors were forced to take a 50% 'haircut' on their existing bonds (The Guardian 2011, BBC News 2011). Figure 5.2 shows Greece's GDP by expenditure falling dramatically from 64 billion euros at the outset of the financial crisis to 46 billion euros by the end of 2013. This indicates that the Greek government did implement austerity measures by cutting spending.
The parliament passed a new austerity package in the first quarter of 2012 that led to more violent protests throughout the country. The New York Times reports that elections for the Hellenic parliament produced larger majorities of anti-austerity officials even as major parties saw their numbers shrink (2012). The winning party was able to create a coalition that passed a new round of austerity measures along with an austerity budget in late 2012.

In 2013, the online news magazine RT reports that the government proposed a “draconian” program to cut a total of 19,000 state jobs with additional wage cuts for civil workers (2013). ELSTAT stated the quarterly GDP growth rate for the country at -2.6%. Eurostat projected the Greek unemployment rate at 27.6 percent by the end of 2013.

Greece has been forced to take drastic cuts to its health sector compared to other struggling European countries. As part of its bailout agreement, Greece had to reduce its public expenditure to just 6 percent of GDP. As a result, Greek public spending for health care is lower than “any of the other pre-2004 European Union members” (Kentikelenis et al 2014, 7). Indeed as Greek citizens continued to endure the hardships of austerity measures they found themselves with less access to basic health services. The economic hardships also caused an increase in drug use and suicide rates. Street work programs that were designed to help marginalized groups (prostitutes, drug users, vagabonds, etc.) were reduced by a third. Preventive control measures such as handing out condoms and syringes were also scaled back. The European Center for Disease Control estimates that the cutbacks in preventive measures resulted in a thirty-two fold increase in HIV infections. The Hellenic Center for Disease Controls observed that tuberculosis infections roughly doubled among marginalized groups by 2013.
The result of Greece’s drastic austerity measures means that the cost of healthcare has shifted to the patients. Health coverage is linked to employment, therefore the rising unemployment rate is inextricably linked to falling health coverage. The situation has become so severe that Doctors without Borders has increased its operations in Greece. Furthermore, Greece scaled back its mental health services by 20 percent between 2010 and 2011, and 55 percent between 2011 and 2012. Major depression as an illness increased from 3.3 percent in 2008 to 8.2 percent in 2011. Attempted suicide increased by 36 percent between 2009 and 2011, and deaths by suicide increased 45 percent between 2007 and 2011. "The data reveals that the Greek welfare state has failed to protect people at the time they needed support the most. A rapidly growing number of Greeks are losing access to healthcare as a result of budget cuts and unemployment,” concluded Kentikelenis (2014, 8).

The Hellenic government also decided to reduce education spending by closing or merging 1,976 schools. The largest cut to the education budget occurred in 2010 with an 8 percent cut. The education budget was further cut 2.9 percent in 2011. However, experts hypothesize that the real cuts to education can be as high as 25 percent when inflation is taken into account! The application of the education budget cuts is not specified but it is almost guaranteed that teacher pay and school maintenance will bear an outsize proportion of the burden.

If one half of austerity measures is cutting spending then the other half is raising taxes. The BBC News article titled “Greek government austerity measures” chronicled the government’s plans to raise property taxes and excise taxes on alcohol, fuel, and cigarettes. VAT rates were raised from 19 percent to 23 percent, 11 percent to 13 percent, and 5.5 percent to 6.5 percent respectively. VAT rates for restaurants and bars was raised from 13 percent to 23 percent. Solidarity levies of up to 5 percent were levied on Greek households and luxury levies on cars, pools, and yachts were introduced for the first time. The tax-free threshold from income tax was lowered from 12,000 euros to 5,000 euros. Overall, the Greek government’s plan was to raise 2.32bn euros in 2011, 3.38bn euros in 2012, 152m euros in 2013, and 699m euros in 2014.
The *Economist* goes into detail about the Greek pension system in the article "What makes Germans so very cross [sic] about Greece?" The generous Greek social security system was drastically altered in order to rein in spending after the financial crisis. *The Handbook of West European Pension Politics* (2007) states that the original statutory retirement age of 55 was raised to 65 with 40 years of work required in order to receive full pension and benefits. Monthly pensions above 1,000 euros received an automatic 20 percent reduction. Retirees under the age of 55(!) with pensions over 1,000 euros received a 40 percent reduction in their payments. Moreover, the Greek government promised to crack down on undeclared work and tax evasion and putting an end to means-tested social security benefits (Blythe 2010).

The combination of spending cuts and tax hikes have created an upswell of Greek anger and frustration that manifests itself in the form of riots and protests. Indeed, a quick search of the phrase 'Greek austerity protests' brings up numerous newspaper articles from major publications like The Economist, The New York Times, The Guardian, Reuters, Al Jazeera, etc. with headlines such as Greek Parliament Passes Austerity Plan after Riots Rage (New York Times 2012), Thousands of workers in Greece strike to protest austerity (Aljazeera 2013), and Clashes erupt as thousands of Greeks protest austerity (Reuters 2012).

In conclusion, Greece – long the poster-child of the European recession- continues to display several economic weaknesses even as elites continue to demand that it apply more austerity measures. Between 2008 and 2012 its economy shrunk by 20 percent. The Greek unemployment rate before the recession stood at 7.7 percent. The Greek unemployment rate in 2013 hovers at 25 percent with youth unemployment reaching nearly 50 percent. Greece has imposed austerity measures that has reduced its overall debt to a degree. Bonds spreads responded to austerity measures positively at first by lowering considerably. However, by 2013 Greek bond spreads spiked dramatically once again. As a result, the Troika has given the Greek state more emergency loans on the condition that it continues to impose austerity measures and lower its debt. Yet the reduction in debt has not translated into an improved economy. On the contrary, major ratings agencies have downgraded Greece's credit rating multiple times.
confidence in Greece’s economy is at a low point despite its adopted austerity measures and lower debt levels.

5.2 Spain

If Greece was the poster child for profligate spending and corruption, Spain was the model citizen, entering the Euro crisis with a net debt-to-GDP ratio of just 26 percent. Spain's problems began in the summer of 2008 when the combined failures of the banking and construction sectors revealed a speculative property bubble that had grown out of proportion. To understand the scope and reach of the property bubble, one has to look at the state of Spanish construction a decade prior to the housing collapse.

According to the Spanish Ministry of Housing, Spanish real estate prices rose by 200 percent from 1996 to 2007! The Spanish government had praised and encouraged home ownership for decades (Bardhan et al 2011). It also created tax incentives to spur the purchase of property. As a result, home ownership in Spain grew past 80 percent. The Spanish magazine *The Local* reports that the number of new properties that were built numbered into the millions; the average number of new buildings being built were about half a million a year (2014). The total number of houses in Spain was about 25 million in a country of 47 million people.

If out-of-control construction was one half of the financial doomsday equation, then rampant lending by banking institutions was the other half. Spanish banks and cajas (regional savings banks) made loans to construction companies and home-buyers alike. All the construction and home purchases meant that property development had become a major contributor to national GDP, accounting for one-fourth of total growth (Melizeo 2014). All the construction also meant that Spain had to import energy and raw materials, which led to an enormous trade deficit, roughly ten percent of GDP (Blythe 2013). The rising trade imbalance also demonstrated that the country was rapidly losing it competitiveness. At the same time, inflation - already higher than
the European average - was steadily rising due to demand for goods and services related to the construction sector. Then the speculative bubble popped in 2008.

Regions were affected differently in Spain. The Basque Country, which relied less on construction and more on industrial production, weathered the economic downturn relatively well (Reuters 2012). Catalonia, on the other hand, suffered a two percent contraction of its regional GDP the following year. Overall, Spain's economy contracted 3.7 percent in 2009. Housing prices fell dramatically, in some cases losing 25 percent of their original value! Many homeowners found themselves underwater and filed for bankruptcy. But in Spain, homeowners are still responsible for paying their mortgages even after foreclosure. Their only other option was to surrender their properties to the banks. The banks reclaimed the houses, seeing as how there would be no way many of the homeowners would be able to pay their obligations. However, it immediately became clear that there was no one to whom sell (or rent) the properties.

Suddenly, Spain's debts and deficits were starting to look like very serious problems. Investors began to fear a Greek-style debt crisis. In early 2009,Standard and Poor’s downgraded Spain's credit rating from AAA to AA+ (The Telegraph 2009). The Greek economy, however, is small and can be contained in the case of emergency. Spain, on the other hand, is the Eurozone’s fourth largest economy and the seventeenth largest economy in the world (World Bank 2010). If investors began a fire sale on Spanish assets, the resulting contagion would spread through the rest of Europe to devastating effect.

Reuters reports in that same year, "The central bank created a 99 billion Fund for Orderly Bank Restructuring (FROB) to help banks’ financing needs" (2011). The Spanish government also initiated a 15 billion euro austerity plan that cut public sector salaries by 5 percent. The government suspended automatic inflation adjustments for pensions while cutting funding to regional governments by 1.2 billion euros. Furthermore, officials announced that support
payments for parents and their new born children (Baby Cheques) were immediately ceased (Reuters 2011).

In February 2010, BBC News reports, "Thousands of workers demonstrate against government spending cuts and plans to raise the retirement age by two years to 67 – the first mass labour protests since the Socialists came to power in 2004" (2010). At mid-year, Prime Minister Zapatero initiated more austerity measures totaling 5 percent of GDP. The measures included further wage cuts and pension freezes as well as a 2 percent raise to the Value Added Tax. Simultaneously, Zapatero’s cabinet passed labor reforms that made it easier for employers to hire and fire workers (BBC News 2010). Unions bewailed the cuts to pensions and labor reforms and staged protests in September 2010. Nonetheless, Reuters notices that “the impact is limited.” Emboldened, the government passes a budget for the next fiscal year with 7.9 percent in spending cuts and added taxes on the rich. For the first time in 13 years, the jobless rate climbed over 20 percent (BBC News 2011). Figure 5.3 shows bond spreads maintain a roughly linear trajectory up to early 2012. After that, there is a dramatic upswing up to early 2013 in which case the interest rate starts lowering again.

![Spanish 10yr Bonds](image)

**Figure 5.3 Source: author**
In 2011, the government announced a new round of spending cuts in the public sector to the tune of 8.9 billion euros. Spain also passes a new pension reform law raising the retirement age from 65 to 67 (The New York Times 2011). *La Voz de Galicia*, a Spanish newspaper, reports that the jobless rate for the country rose to nearly 23 percent while the jobless rate of individuals under 25 exceeded 48 percent! It is during this time that protests against austerity measures began in earnest.

A grassroots organization called ¡Democracia Real YA! (Real Democracy NOW!) staged massive protests in various Spanish cities and towns on May 15 and subsequent smaller ones throughout the year. According to their website (www.democraciarealya.es), the movement states that “we are all concerned and angry about the political, economic, and social outlook which we see around us: corruption among politicians, businessmen, bankers, leaving us helpless, without a voice.” Prime Minister Zapatero announces around this time that he would not be seeking a third term. *The Economist* wryly notes that Zapatero entered into service with a booming economy but was leaving it in shambles, stating that “A toxic combination of an outdated economic model, a burst housing bubble and the global credit crunch has left investors wary and a fifth of the Spanish workforce unemployed” (2011).

In 2012, the new Prime Minister Mariano Rajoy of the People’s Party implements a fiscal budget that slashes public spending by 16.5 billion euros and halves the deficit from 8 percent of GDP (BBC News 2014). As a result, Spain slipped back into recession and unemployment surpassed 5 million people. The Washington Post reports that the unemployment rate rose to 25.1 percent of the workforce while youth unemployment rose to a staggering 52.9 percent (2012). The Spanish jobless rate at this point was by far the highest in Europe surpassing even the Greeks! One of Spain’s largest banks, Bankia, also asked the government for a 19 billion euro loan to cover its toxic assets (The Telegraph 2012). Investors were rattled by all the negative economic news coming out of the country. Consequently, Spain was shut out of the bond market and asked
the ECB for a 100 billion loan to cover its debts. Europe’s finance ministers agreed to the bailout on under certain conditions.

Come January 2013, Spain continued to deliver worsening economic news. Catalonia, Spain’s largest autonomous region, asked for a 9 billion euro bailout to cover its debts (Daily Mail 2013). In total, Spain’s regions have a combined debt of 115 billion euros which posed serious risks to the central government. The Wall Street Journal’s headline exposes another continuing problem, "Spain Jobless Rate Hits 26% Amid Austerity.” The jobless rate now affects over 6 million people. The article notes that “the economy continued to shed public- and private-sector jobs as the government worked to slash a big budget deficit... the government has raised income and sales taxes, slowed the growth of pension payments and cut unemployment benefits” (WSJ 2013).

Consequently, union workers, public sector workers, and the unemployed staged general strikes throughout the country wailing against austerity measures. The protests became larger and more violent with headline descriptions such as “Citizens’ tide of anti-austerity protests hit Spain; dozens injured, arrested” (RT 2013), “Spanish firefighters protests austerity cuts in Barcelona (NBC News 2013), "Protesters demonstrate against austerity measures across Spain” (DW 2013). However, in September Spain officially rose out of recession with 0.1 percent growth receiving accolades from the IMF (BBC News 2013). Investors began to purchase Spanish bonds in small amounts despite its economic hemorrhaging. The New York Times noted that although investors were cautiously optimistic, Spain was still in a harsh position, "The root of the problem is that Spain is attempting to do two contradictory things: pull off an internal devaluation within the euro zone to bolster trade competitiveness, while ensuring that its debt burden remains sustainable” (2013).

The British Medical Journal published an article titled "Will austerity cuts dismantle the Spanish healthcare system?” stating that “Public expenditure on healthcare is low... in 2010,
Spain spent 9.6% of GDP on healthcare, 26% of this was from private sources and 74% was public, with the latter equivalent to 7.0% of GDP, compared to an average of 7.6% in the European Union.” Similar to Greece, reduced healthcare spending in Spain has amplified problems precisely when its citizens need it the most. Reuters found that national budget cuts of roughly 14 percent and regional budget cuts of 10 percent for health and social services coincided with increased demands from vulnerable populations such as the disabled and elderly (2013). Furthermore, mental ailments such as depression and suicides increased. The confluence of decreased healthcare spending and rising healthcare needs created longer wait times and reduced services.

In conclusion, Spain entered the financial crisis under positive economic conditions. Yet Spain’s internal weaknesses of an overexposed banking system and an economy overly reliant on the housing industry came to the forefront and spooked investors. Pushed on by the Troika, Spain began to take a series of steps to rein in its debts and deficits. In 2013, investors began to slowly purchase Spanish debt again but vulnerabilities in the economy still remain. Similar to Greece, Spain was able to lower its debts through austerity measures. The similarities with Greece continues in the fact that austerity measures and lowered debt levels did not lead to significantly increased investor confidence. Bond spreads continued on a steady trajectory only to rise and then fall. As a result, austerity can be perceived as not accomplishing its goals. The primary results of austerity have been high unemployment, marginal debt reduction, added loans needed, and increased worker strife.

5.3 Italy

Italy, much like the other sovereigns that adopted the euro, enjoyed the benefits brought about by Germany’s credit rating. When Italy adopted the euro in 2002, it immediately saw its borrowing costs fall as investors were hungry to purchase its debt (European Commission 2011). These circumstances created a flood of cheap money that fueled Italian growth for a while. Thus,
investors ignored the country's economic warning signs for nearly a decade. However, as Greece came to near bankruptcy in 2009 and Ireland's real estate bubble was collapsing, investors took a second look at Italy's economic weaknesses and began to raise serious doubts.

The Italian economy had structural problems long before the Eurozone crisis began in 2009. For the past two decades, Italy's economy had been growing at 1.5 percent (OECD). Part of the problem can be explained by demographics, Italy ranks 158th out of 230 countries in population growth (Index Mundi 2014). The median age of the population is 43, and one-fifth of the population is sixty-five years of age or older. The CIA Library website estimates that one-third of Italy's population will be over the age of 60 by 2035. These statistics may have made investors nervous as they felt that the working class would be paying for pensions instead of bonds.

Observers also noticed that Italy's economy demonstrated marked disparities. The Economist (1997) notes that the north of Italy contains its business and financial center, equal to other major financial cities such as London, New York, or Munich. Milan, Italy's main commercial and financial capital, produces most of the higher-end goods and services for the country. The south of Italy, on the other hand, is much poorer than the north with an economy specializing in agriculture. The income disparities are so great between the two regions that Italy's northern sector subsidizes the southern sector to keep it economically viable. Similar to Greece, Italy has the problem of not taxing its southern citizens accordingly, which has slowly created a large public debt burden (Blythe 2013). This is not so much an accounting problem as it is a problem of political will and competence.

Furthermore, Italy has been plagued with higher than average corruption in the form of back deals, bribes, scandals, and nepotism. Transparency International (2013) has placed Italy 69th in the list of 177 countries on its Corruption Perceptions Index, making one of the highest in
the European Union. This has created a government ill-equipped to tackle the challenges of growing an advanced economy. An OXFAM case study by Francesco Petrelli concurs:

The earlier lack of growth was the result of a range of difference factors: a lack of effective policies to address the development gap between northern and southern Italy; rampant corruption and the ongoing influence of organized crime on the economy; the failure to tackle fiscal evasion and avoidance; and the lack of coordinated investment in vital areas, such as tourism and support for small and medium enterprises (SMEs).

Economonitor reports that Italy officially entered a recession in November 2008 after posting two consecutive quarters of negative growth. Italy began feeling the pressure to pass economic reforms later than its neighbors. Experts warned Italy about its mounting debt, which at 1.9 billion euros was three times the debt of Ireland, Portugal, and Greece combined! On May 25, 2010 Italian Prime Minister Silvio Berlusconi announced a 24 billion euro austerity measure meant to reduce the deficit to 2.7 percent of GDP (CNN). Euroactiv says that Italy saved the money by cutting public sector jobs, stating that only “20% of those who leave the public sector between 2011 and 2013 would be replaced.” Italy’s public sector also received an 8 to 10 percent pay cut as well as government spending cuts. Needless to say, public workers expressed resentment at what they perceived as unfair targeting by the national leadership. As a result, Berlusconi’s favorability ratings dropped precipitously. Protests began to form at this time but not to the extent that they have in other PIIGS countries.

In 2011, the IMF urged the Italian parliament to reduce its public debt further and push for more spending cuts. Later that year, Italian government bonds rose above 6 percent while public debt rose to 120 percent of GDP (BBC News). In order to assuage investor worries, Italy approved a 54 billion euro austerity package designed to balance the budget. Italian politicians tried to generate revenue by increasing taxes on households to over 44 percent of gross income, raising VATs to 21 percent, and reintroducing property taxes (Petrelli 2013). The austerity package also included spending cuts in the form of a 3 year pay freeze for public-sector workers, an increase in
the retirement age for private-sector workers, and cuts in pensions (Reuters 2015). In spite of the austerity measures, Bloomberg News reported that Standard and Poor's downgraded Italy's credit rating from A+ to A. Facing falling poll numbers and a shrinking parliamentary majority, Berlusconi chose to resign later in the year. As a result, Berlusconi was out of office³.

![Italian 10yr Bonds](chart)

*Figure 5.4 Source: author*

Figure 5.4 shows that austerity measures correlated with rising bond rates by late 2009 and then dropped back to normal by late 2013. European Union commissioner Mario Monti became the new Prime Minister and formed a technocratic government designed to address Italy's debt burdens. In December 2011, Monti introduced another austerity package worth 33 billion euros which tackled tax evasion and raised taxes. *The Buenos Aires Herald* explained, "Measures are expected to include extending the retirement age for many workers, liberalizing professional services and new taxes on private assets." In January 2012, Fitch downgraded Italy's credit rating

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³ The significance of his ouster should not be underestimated. Silvio Berlusconi, the man who survived bribery scandals, prostitution scandals, corruption charges, freedom of speech violations, freedom of press violations, political manipulations, legal manipulations, links to the mafia, religious intolerance accusations, human rights violations, charges of misogyny, expressed anti-immigrant sentiments, fraud, nepotism, and anti-Semitism charges for a 20 year period to become one of Italy's longest serving politicians was undone by the austerity measures he proposed in face of the European financial crisis.

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from AAA to A-. 10-year bond yields rose to 7.2 percent (Bloomberg News 2012). The ECB bought Italian debt to stabilize yield rates.

Nadeau reports that Italy’s austerity measures disproportionately affected the south, resulting in nearly 150,000 jobs lost for people over the age of 25 and 329,000 jobs lost for people under the age of 25 (The Daily Beast 2012). Youth unemployment rose to an unprecedented 35 percent! Left wing parties and students protested austerity measures in large numbers in May. A Time article titled “Italy’s Job Crisis: Why Young Italians Are Leaving” explains that Italy is geared towards a gerontocracy (rule by the elderly) that disproportionately favors the old at the expense of the young, “Italy’s economic woes have fallen hard on the shoulders of the country’s youth... but university graduates have a tougher time finding work that fits their qualifications.” This applies to graduates with degrees that are considered “useful.”

A large number of Italian students studied fields such as law, teaching, and nursing. This may not be a problem in a regular economy, but having so many people entering fields that are not productive in the classical sense has become a problem. China and India produce computer programmers and material physicists, professions that have the capacity to raise real GDP. The law field is not 'productive' in any literal sense, and teaching and nursing draw their pay schemes from the government. Moreover, having so many young people enter those fields has created a glut, creating a class of highly educated unemployed workers who cannot readily transfer their skills to other sectors of the economy (The Economist 2012).

By 2013, Italy’s applied austerity measures have produced few results. Paul Krugman noted in his New York Times column that “austerity hasn’t even achieved the minimal goal of reducing debt burdens. Instead, countries pursuing harsh austerity have seen the ratio of debt to GDP rise, because the shrinkage in their economies has outpaced any reduction in the rate of borrowing.” Mario Monti lost the majority vote to remain Italy’s Prime Minister on February 24,

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4 The New York Times chronicles the experiences of a young professional named Francesca Esposito with a law degree, a master’s degree, and fluency in five languages who could only find unpaid jobs in Italy.
Monti, like his predecessor Berlusconi, was also the victim of the unpopular austerity measures that he himself advocated a year earlier. In April, Enrico Letta became the new Prime Minister of Italy. Letta’s coalition passed a series of “stability laws” that contained 12 billion euros in spending cuts and 3.7 billion euros in tax cuts for businesses as well as a VAT increase of one percent and cuts to pensions (WSWS 2013).

Italians took to the streets to protest against what they perceived to be a lack of political will on Letta’s behalf. NBC World News Report quoted one individual as saying “We need to start over with more investment. If we don’t restart with public and private investments, there will be no jobs.” The protesters felt that the leftist Letta was reneging on his promise to focus on job growth. Figure 5.5 shows Italy's GDP by expenditure had lowered significantly similar to Greece.

![Figure 5.5 Source: Federal Reserve](image)

Oxfam reports that Italy’s austerity policies have impacted the services it provides greatly, “Further cuts have been made to the Fund for Family Policies (from €185.3m to €31m) and from the Fund for Youth Policies (from €94.1m to €8.18m).” Inequality, which was plaguing Italy before the crisis, has widened further during the Great Recession. The same Oxfam article reports that austerity measures affected the rich less than the poor and that VAT increases proved to be more problematic for lower income earners (Petrelli 2013). Italy’s austerity measures have not
only shown themselves to be unpopular and ineffective, but they also pose an especially heavy burden on lower class individuals who are more likely to use government services.

The evidence demonstrates that the austerity measures that various European countries adopted, particularly the PIIGS, have so far impeded them from soaring to new economic heights. Quite the contrary, the PIIGS countries continue to show sclerotic growth, elevated debt levels, and high levels of public dissatisfaction. Undoubtedly, the PIIGS countries bear responsibility for the structural weaknesses in their economies that aggravated an already precarious situation brought on by the global financial crisis. However, austerity measures have not led to a larger economy.

On the contrary, the austerity measures imposed on them by the Troika may have exacerbated the problem further. To summarize, austerity measures produced mixed effects for the countries that implemented them. Bond spreads for these countries rose and fell during the measured time period. If austerity measures did have some measure of success it was drowned out by negative economic indicators that did little to reassure investor confidence. Interestingly, the PIIGS countries may not have had much of a choice in how they addressed recessionary periods. The adoption of the euro guaranteed that Eurozone countries would have limited options in fighting economic downturns. After all, the euro is really just type of gold standard.

5.4 The euro, a modern day gold standard

In order to understand the predicament that EU member nations find themselves in, the subject of the gold standard has to be brought up. The fact that these countries adopted the gold standard only to abandon the practice a few decades later is very telling in itself. But why was the gold standard even implemented in the first place?

In the early 1800s, countries throughout the world began to trade at an accelerated rate. Vast quantities of goods such as minerals, timber, and spices were in high demand. Shipping technology became more reliable and efficient. But there was the problem of fiat money. A large
number of countries traded in their own currencies. Americans traded with the dollar. The British traded with the pound sterling. The Spanish traded with the peso and the Germans traded with the deutsche mark, respectively. The problem was twofold: How would country A know that the money it received from country B had any value whatsoever? Moreover, how would country A know what the value of its currency was relative to country B? The solution was simple: trade in a currency that the community of nations could agree had real intrinsic value. Since the dawn of human civilization empires had placed value on precious metals, particularly gold. So it should come to no surprise that the political elite of the time decided that the world would trade in a fusion of paper money and gold.

Thus, the gold standard was born. The idea behind the gold standard is simple: Every nation that wanted to trade in the global arena had to tie its currency to gold. Therefore, country A would sell country B its exports knowing that the currency it received was backed by gold. If Country A chose to, it could return to Country B at a later date and convert its paper holdings to gold. So when a country sold its exports to another country it was, in essence, importing gold in return. As long as countries maintained the ratio of its bank notes to its gold reserves equal, there was no problem.

But what would happen if a country printed more money than was in its gold reserves? If a receiving country suspected that the issuing country did not have enough gold to cover its currency debts, it could demand that all its notes be converted to gold immediately. When it became clear that this was not possible, all other participatory nations would find out that the offending country was inflating its currency and demand that their notes be converted to gold as well. The notes of the offending country would be dumped all at once and, having no more gold as cover, would have its economy decimated for the foreseeable future.

However, the real problem lay in the continuous cycles of inflation and deflation that countries on the gold standard would experience. For example, a state would begin by exporting
more than it was importing, increasing its own gold supply. Both government coffers and citizen's wages would rise as a result, generating more spending within the state. The demand for various products increases and businesses would react accordingly by raising prices. Suppliers would also see demand for their goods rise and so they too raise prices. Soon, the cycle of greater demand and rising prices gives way to inflation, making the state's exports less competitive. Unable to compete with other countries cheaper exports, the state would begin to import products at a greater pace. A greater influx of imports meant that the money supply would shrink and, by definition, the country's gold reserves. The country, now having a trade deficit, is forced to cut wages and government spending, i.e. austerity. The citizenry would then begin to reduce their consumption as they are unable to afford goods and services. Businesses, seeing their sales plummet, would reduce prices to entice customers to spend more. Suppliers would also be forced to reduce their prices because falling demand no longer justified their current price levels. The country would then find itself in the throes of deflation. Nonetheless, deflation has caused the country's exports to become competitive again which creates a new era of export-led growth and the inflationary/deflationary cycle would begin anew.

Mark Blythe (2013, 183) comments on the gold standard, "It was self-regulating, automatic, and impersonal- which was precisely the problem the moment ordinary people got involved." The citizenry began to live in a constant state of uncertainty and fear, which soon gave way to frustration and anger. The brief period of positive, export-led growth would soon lead to inflation, which was combated with aggressive deflation. The government would cut spending and raise interest rates. At this point the country may accrue further debt through loans with the intention of paying down its debts. Inevitably, this would lead to a recession, which reduced consumption and the money supply further still. Soon the country found itself in a deflationary spiral, unable to grow out of its money problems. The people would revolt against their government, demanding protection against the vagaries of the economy. Mark Blythe (2013, 183)
continues, "Swap the "convertibility into gold" for "the integrity of the euro," and it's the same system. The basic problem of running a gold standard and the Eurozone are one and the same."

Thus, by adopting a single currency, the Eurozone greatly limited the amount of flexibility its member states had in combating economic downturns. According to Blythe, there are four things a state can do to combat a recession: inflate, devalue, deflate, and default. Inflation, the rise of prices for goods and services over time, helps combat recessions by eroding the value of claims, ergo debts are worth less because everything else costs more (Krugman 2012). Devaluation is, as its name implies, the devaluing of the currency in order to make internal wages and exports more competitive. This is considered a more attractive option because workers keep their wages and services without serious sacrifices. Deflation is fiscal adjustment through pay cuts and spending freezes, i.e. austerity. This is what many Eurozone countries are doing right now. Finally, default refers to a state's failure to fulfill its monetary obligations, which can have disastrous economic consequences.

By virtue of adopting the euro, the EMU (European Monetary Union) removed the option of inflation and devaluation. This only leaves two options, deflation and default. Truthfully, default is not a viable option either because of the panic it can create. If even one Eurozone country were to default -say Greece- the result could be massive investor panic that could spread contagion to other euro countries and destroy the EMU project. This scenario would lead to worldwide financial ruin. The only real option struggling states have is to deflate by applying austerity measures. Yet, countries that were on the gold standard over a century ago were ultimately forced by their citizens to adopt their own currencies because they would not stand for austerity measures any longer.

It gets more complicated. After World War I many countries once again adopted the gold standard in the hopes of reviving their economies. The result? All the countries that adopted the gold standard a second time left it again, without exception: United States 1931-1937, Britain
1925-1931, Sweden 1924-1938, Germany 1924-1933, France 1926-1936, and Japan 1930-1937 (Blythe 2013). This leads to Blythe's (2013) two rules: 1) austerity does not work and 2) you cannot run a gold standard in a democracy. So why did the European Union create a single-currency zone?

Krugman (2012, 168) explains, "Cross-border business is more expensive if currencies must be exchanged, multiple currencies kept on hand, and/or bank accounts in multiple currencies maintained." It is expensive to deal with multiple countries using different currencies. Furthermore, many EU countries would try to gain an advantage over each other by lowering the value of their currencies, in essence making their exports and labor cheaper (Blythe 2013). The constant hassle of currency exchanges and monetary one-upmanship made the idea of a single-currency union appealing. Can a single-currency union work? Yes. Look no further than the United States of America to see how fifty different states can coexist using the same monetary denomination.

The grand experiment that is the United States works because there are high levels of fiscal integration and labor mobility (Krugman 2012). In other words, states are covered by the federal government and everyone speaks the same language, English. The European Union is not united to the same degree. Language and cultural barriers exist between different countries. The economic health between nations varies widely. Furthermore, there is no EMU-wide, overreaching institutional body like the American federal government to set fiscal policy. These differences do not lend themselves well to a single-currency system.

5.5 Summary

And so the PIIGS continue stuck in the mud. Economic indicators do not bode well for many European countries. The Economist reports on the euro zone growth prospects for 2015:

There are now serious worries that the euro zone will succumb to a "triple-dip" recession. Only Lithuania—which joined the euro zone on the first day of 2015—and Ireland are forecast to see strong growth next year. Fears grow that the 18-
member currency club may fall into deflation. Inflation fell to just 0.4% in October, well below the European Central Bank’s target of almost 2%. Among other things deflation makes debt harder to bear. Seven euro-zone countries are forecast to have public-debt-to-GDP ratios of over 100% next year; the proportion of loans in default is rising in Portugal, Italy, and Greece.

The hypotheses stated earlier in chapter 3 were corroborated. Hypothesis 1 - stating that austerity measures will not significantly raise investor confidence- and hypothesis 2 - stating that bond spreads will rise signaling a loss of investor confidence- produced mixed results. The bond spreads in the analysis initially rose, especially for the PIIGS countries but began to fall in late 2012. Supporting evidence indicates that bond spreads did not fall because of increased investor confidence but due to increased support from the ECB and/or a general divestment from European bonds to more lucrative, safer havens.

After five years of austerity virtually all euro zone member states are facing some form of economic hardship. Greece, Spain, and Italy continue to find themselves in dire economic straits. As a whole, the PIIGS countries have been plagued with stagnating economies, rising debts, and civil unrest. Leaders that imposed austerity measures were subsequently removed from office, even the ever-omnipresent Silvio Berlusconi. The most vulnerable members of society were the ones shouldering the brunt of wage cuts and spending cuts. Unemployment rose dramatically during the European great recession and a whole generation of young people have had their careers stunted. History has demonstrated that austerity measures and gold standards do not work.

The PIIGS countries bear responsibility for the structural weaknesses in their economies that aggravated an already precarious situation brought on by the global financial crisis. Nonetheless, the austerity measures they adopted exacerbated the problem further. If austerity measures did have some measure of success it was drowned out by negative economic indicators that did little to reassure investor confidence. These facts alone cast doubt to the credibility of
austerity as a purveyor of economic growth. The conclusion to this thesis will analyze the reasons why people promote austerity despite their mixed results and finish with final remarks.
Austerity’s history has been delved into some depth. Its past has been marred with the inability to produce the results it was supposed to accomplish. Indeed, a common currency and austerity go hand in hand because the options of inflation, devaluation, and default are removed from the equation. Nonetheless, austerity failed during the time when the gold standard was in effect in the 18th, 19th, and 20th centuries. Austerity failed during World War II. Austerity is producing mixed results for Eurozone countries as of this writing.

Yet, the practice has a strong foothold in elite opinion on various parts of the world. Regression models created by this study have demonstrated that European sovereigns that have applied austerity measures produced mixed results. To summarize, the regression models demonstrated that global and risk variables produced more explanatory power during period 1 when the financial crisis hit. Local variables produced more explanatory power during period 2 when governments imposed austerity policies to reduce their debts and deficits. A higher asset-to-debt ratio correlated with more investor confidence. Next, this paper will examine how those regression models can be improved upon.

6.1 Methodological improvements

As is usually the case, there is room for improvement in creating models with more explanatory power. First, this paper recommends using financial data as opposed to economic data because financial data contains more observations. It is not uncommon for stock returns and swap rates to generate multiple data points in a single day. Second, generating more observations with financial data will allow a researcher to observe country-specific movements by way of time series analysis. Thus, the regression model can match the coefficient of a single variable to a specific country as opposed to all countries. Third, this paper recommends adding credit default swap (bond insurance) spreads as a dependent variable because they have less requirements to be
purchased and sold and as a result "react" faster to changes in the market (Fontana and Scheicher 2010). Lastly, this analysis recommends adding more independent variables to the regression model to add more explanatory power. This study will list those independent global and local variables.

6.1.1 Credit market development

The iTraxx Europe index measures the credit derivative products of Europe. Hans Bystrom (2005) in his article titled 'Credit Default Swaps and Equity Prices' finds a significant negative correlation between CDS indexes and stock price volatility. This is significant because Collin-Dufresne et al (2001) suggest using stock returns as a proxy for the state of a country's economy. Bystrom (2005) also discovers a positive autocorrelation within the studied iTraxx indexes which may indicate inefficiencies in the market.

6.1.2 Liquidity

Beber, Brandt, and Kavajecz (2009) state that during times of crisis, investors have the option to 'flight-to-quality' or 'flight-to-liquidity'. This means that investors can purchase assets perceived as safer or purchase assets that are more easily converted to capital. Beber, Brandt, and Kavajecz (2009, 27) conclude that 'flight-to-quality' behaviors exhibited by investors occur during bond evaluations but that, "in times of market stress, investors chase liquidity, not credit quality". Fontana and Scheicher (2010) likewise come to the conclusion that demand rises for "liquid-safe" assets during market exigent conditions. Benkert (2004) included a liquidity variable in his model by measuring the difference between the 3-month USD interest rate swap and Treasury yield.

6.1.3 Risk-free rate

In capital asset pricing models, the risk free rate is defined as "the compensation for systematic risk which cannot be eliminated by holding a diversified portfolio" (Investopedia). Thus, any additional risk incorporated by the investor is expected to be rewarded with a higher
rate of return. Since in practice all investments carry minute amounts of risk, the interest rate is
tied to the three-month U.S. Treasury bill. The regression analyzes only European Union
member states and therefore requires a Euro-centric variable.

6.1.4 Slope of term structure

Kurmann and Otrok (2012) acknowledge that the slope of term structure acts as a
significant explanatory variable in financial and macroeconomic models. More importantly, the
slope of term structure is expected to reveal the state of the general economy. An increase in the
slope of yield curve may imply a strengthening economy while a decrease in the slope of yield can
hint at a weakening economy. Winckelmann and Sorensen (2011) created the slope of term
structure by taking the difference between the 10-year euro swap rate and the 3-month Euribor
rate.

6.1.5 Investment-grade spread on corporate bonds

Elton, Gruber, and Agrawal (2002) find that the expected default of a corporate bond
accounts for only a small portion on the premium for corporate rates. Hence, they observe other
factors which may help explain the spread costs. Thus, measuring the investment-grade spread
can indicate the level of risk associated with the bond. The variable would measure the spread
between AA and BBB-rated corporate bonds.

6.1.6 Leverage ratio

Winckelmann and Sorensen (2011) warn against solely focusing on government debt since
it could be an indication of a growing economy. Instead, they recommend including economic
productivity as a measure of a country's indebtedness. The variable formed is the debt-to-GDP
ratio, construed as the size of government debt relative to domestic economic output. A higher
ratio is expected to lower the sovereign credit quality since it suggests added difficulties with
servicing the debt. Furthermore, a higher ratio should correlate with higher yield spreads in CDS
and bonds.
6.1.7 **State of the local economy**

Collin-Dufresne, Goldstein, and Martin (2002) find that even as credit-risk factors and liquidity account for some changes in credit spreads the principal factors are driven by local supply/demand shocks. The country can either recover from the aforementioned shocks or continue to show signs of stagnation. The country’s recovery rate is determined by taking the Euro market-wide stock log-return and subtracting the log-return of the country's stock index.

6.1.8 **Exposure to the financial system**

Dieckmann and Plank (2011) argue that governments that interfered to stabilize their financial systems created private-to-public risk transfers. Specifically, countries increased their sovereign risks by taking ownership stakes in banks and assuming their liabilities, making the bank's financial problems their own. Winckelmann and Sorensen (2011) speculate that governments do this by issuing more debt, which in turn increases leverage ratios. The CDS spread should reflect the country's level of exposure to the financial system with a positive directional coefficient indicating a greater risk of default.

6.1.9 **Sovereign credit rating**

Monfort and Mulder (2000) note that sovereign credit ratings are significantly linked to bond and CDS spreads. Several European Union member states are embroiled in the ongoing debt crises that have damaged their credit ratings. Rating downgrades may prompt investors to pull out entirely or demand higher yields for taking on more risks. A potential problem in analyzing sovereign ratings are the effects of contagion. Estevan Flores (2010) found that rating announcements in emerging markets created spillover effects for periphery countries. Winckelmann and Sorensen (2011) created the proxy by translating the rating for each country into a number between 1 and 21. Furthermore they adjust the ratings outlook with -.03 for a positive outlook and +.03 for a negative outlook. "Ratings data is obtained from Fitch and the
transformation of the ratings into a figure implies that the rating AAA = 1, AA+ = 2 and so forth ending with D = 21."

This paper intended to use the variables stated above. Nonetheless, my academic institution does not have access to financial data providers such as Nordea Analytics, Bloomberg, or Datastream. Purchasing the data on my own would have been prohibitively expensive. However, I was able to create regression models that followed the basic concepts as the ones created by Winckelmann and Sorensen (2011). Additionally, the models I created produced similar findings to the ones created by these authors.

Regression models, particularly those that seek to measure austerity, are supplemented by real-world examples. Chapter 3 detailed how specific nations have implemented austerity measures and recorded their effectiveness. Next, this paper will detail how austerity became the weapon of choice in the struggle against debts and deficits.

6.2 Austerity benefits creditors

The Morning Star reports that an audit carried out by the Collective for Citizen Audit of Public Debt (CCAPD) found that France’s increased debts leading up to the adoption of the euro cannot be explained by increased spending on its citizenry or infrastructure projects. Instead, the study notes that the French government lowered taxes and created loopholes for large businesses and wealthy households. The result was that the French government deprived itself of revenues by five points (in GDP) over a 30 year period. The CCAPD estimates that excessive interest rates and tax cuts account for 59 percent of France’s current public debt. As soon as the financial crisis affected France, President François Hollande enacted austerity measures that included a reduction in public expenditures by 10 billion euros and an increase in the VAT (Huffingtonpost 2013). Lamrani specifies that the VAT increase included a 3 percent hike for common essentials such as electricity, gas, books, public transport, and certain medications.
The story of a state finding itself in dire economic straits and proposing austerity measures as the only solution to its debt crisis has become a common theme in this paper. France is unique in the fact that it also tried to raise taxes on its wealthiest citizens. Bloomberg News says that President Holland initiated a plan in late 2012 to raise taxes on incomes over 1 million euros by 75 percent and have companies pay a 50 percent duty on wages over 1 million euros. The result was a massive outcry from France’s conservatives and by watchers abroad who wailed that the tax hikes were an all-out assault on the rich. The French actor Gérard Depardieu publicly denounced the tax cuts and announced his intentions to renounce French citizenship (CNN 2013).

To make matters worse, the Conseil Constitutionnel - France’s equivalent of the Supreme Court - struck down the measure as unconstitutional, in part due to how the law was worded (TIME 2013). Holland himself admitted that the law was a symbolic gesture that was supposed to demonstrate that he wanted France’s wealthy citizens to partake in the sacrifices many ordinary French people had already made.

The merits of the tax-hike law can be argued *ad infinitum*, but it is interesting to note how quickly the elite acted to prevent this law from taking into effect. There are far fewer examples - if any - of the elite moving with such ferocity to stop austerity measures from affecting citizens of more modest backgrounds. Simply put, austerity measures benefit one group of people at the expense of another group of people. The oft stated remark that austerity measures benefit the wealthy is basically true, but is somewhat misleading. The current shibboleth of elite opinion benefits creditors. This is particularly true for policy makers within the Eurozone. Krugman (2012, 206) puts it succinctly:

If you look at what Austerians want - fiscal policy that focuses on deficits rather than on job creation, monetary policy that obsessively fights even the hint of inflation and raises interest rates even in the face of mass unemployment – all of it in effect serves the interest of creditors, of those who lend as opposed to those who borrow and/or work for a living. Lenders want governments to make honoring their debts the highest priority; and they oppose any action on the monetary side
that either deprives bankers of returns by keeping rates low or erodes the value of claims through inflation.

It should come as no surprise that income inequality has widened during this time period. According to a recent Oxfam (2015) report, the richest 1 percent of people in the world owned 48 percent of global wealth in 2014. The richest 20 percent (after the richest 1 percent) owned the other 46.5 percent of global wealth. That left the remaining 80 percent of people owning 5.5 percent of the world’s wealth. Oxfam warns that if these trends continue, the top 1 percent will own more than 50 percent of global wealth by 2016 and exceed the combined wealth of the other 99 percent. It is impossible to extrapolate generalizations about the cause of the increasing wealth gap from the study. Yet the fact that the rich are getting richer does indicate that their interests are being served accordingly.

6.3 Concluding remarks

This thesis has produced regression models supporting the fact that European sovereigns have applied austerity measures with mixed results at best and negative results at worse. It is said that although many economists know how to produce statistical models, few of them actually trust those models. The best source of data are “natural experiments” that played themselves out throughout history. The 19th century world’s attempt to create a gold-based global currency was an economic experiment. America’s massive spending during World War II was an economic experiment. Europe’s foray into a single monetary union and its subsequent austerity-based policies were an economic experiment. Kansas’s trickle-down approach of slashing taxes and removing tax breaks was also an experiment. The results of those experiments warrant our attention. Spending- under specific circumstances- has positive economic effects. Cutting taxes and enacting austerity measures-under certain circumstances- has negative effects. When those circumstances repeat themselves in our present and policymakers refuse to acknowledge them problems occur.
History has demonstrated that banks caused the financial crisis and, as a result, had to be bailed out. The states absorbed the bank’s losses unto their spreadsheets and found themselves saddled with massive debt. At the insistence of the European political elite, struggling member states imposed austerity measures to reign in their debt. The results have been disastrous with shrinking revenues, high unemployment, and rising debt levels. After five years of austerity virtually all euro zone member states are facing some form of economic hardship. The PIIGS countries have demonstrated continued economic dysthymia. Leaders that imposed austerity measures were subsequently removed from office. The most vulnerable members of society are bearing the brunt of wage cuts and spending cuts. Unemployment rose dramatically during the European great recession and a whole generation of young people have had their careers stunted.

Austerity's purpose must be reiterated, "The central intent of such policies is to reduce government spending, pay down public debt, and restore confidence in a country's financial stability" (EU Center 2013, italics mine). This paper’s regression models produced mixed results regarding austerity and bond spreads. Some countries had their bond spreads rise after austerity measures were implemented while other countries had their spreads fall. The country analysis portion of the study paints a more negative picture of the effects of austerity measures by detailing political unrest, riots, and falling living standards. The fact is that austerity measures do have a place in economics and policy. That place, however, is not during the middle of a recession. When consumers and businesses start spending less this inevitably leads to lower economic growth. European elites can continue to insist that struggling member states impose austerity measures to raise investor confidence. If that is the case, then they will have to continue to wait for the confidence fairy.
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CURRICULUM VITA

David Uresti has spent his life in the border city of El Paso, Texas. Beginning his education at Fannin Elementary School and graduating from Andress High School in 2001, he went on to receive a Bachelors of Arts in Political Science at the University of Texas at El Paso. David originally studied with the intention of practicing law but changed his field of interest to economics and international relations. He is an aspiring scholar and writer.

Permanent address: 10049 Manitoba Street
El Paso, TX, 79924

This thesis was typed by David Gerard Uresti.