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THE INSTITUTIONALIZED CORRELATION BETWEEN DEBT AND GDP
IN ARGENTINA

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Abstract

As the world recovers from the Great Recession of 2008, economists have turned their attention to the increasing burden that public debt places on GDP. For the first time, researchers have the information available to study the relationship between these two economic indicators. However, research on emerging markets remains rare, and no study has been done solely on one country following a default, such as Argentina. Unfortunately, these countries are more likely to need information on the correlation between these two factors. GDP growth in countries with a history of high debt may be more susceptible to growth constrictions. Following its 2002 default, Argentina completely restructured its public debt to end any negative correlation between its high debt and economic growth. This thesis will seek to investigate whether or not the debt restructuring in 2005 successfully ended any negative correlation between Argentina's GDP and public debt. This information could have implications for many historically debt-burdened countries.

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Chapter 1: Introduction

Nobel prize winning economist, Simon Kuznets, once said, "There are four kinds of countries in the world: developed countries, undeveloped countries, Japan, and Argentina." Today, the literacy rate in Argentina is nearly 98%, and the country has a quantity of natural resources comparable to Canada and Australia. It has the third largest economy in Latin America, and it is among the G-20 major economies. However, the country that was one of the ten wealthiest in the world in 1900 had dropped to seventieth by 1990 (Tanzi 2007).

The "Argentine paradox" is one of the most instructive economic declines in the modern world. This paradox is how a country that was once developed and rich, ahead of Germany, Italy, and France, lost its wealth. Argentina has gained attention for decades for achieving wealth and advanced development in the 20th century but experiencing a reversal in fortune, culminating in the largest sovereign default in history in 2001.

Beginning with the Baring Crisis in the 1890s, the Argentine economy has been encumbered by its public debt. The result of reckless, unrestrained spending has been decades of fluctuating international investment, lax fiscal policy, and inflation. However, the principle consequence of Argentina's erratic spending and fiscal policy has been decades of high debt burdens and stagnant GDP growth.

The majority of the last century of economic tumult in Argentina can be divided into two eras. The first era was marked by economic growth despite defaults and high debt. This period lasted until World War II and the administration of Juan Peron. Emphasizing self-sufficiency and industrialization, Peron began to use the profits from agricultural exports to invest in industry and manufacturing with strong, state-controlled unions. Peron adopted protectionist trade policies and nationalized banks and businesses while implementing generous social programs. This fiscal policy was only sustainable as long as

Argentina was earning large profits from exports. Without a strong inflow of money, Argentina could not pay its debt while maintaining growth.

Due to continuing deficits and debt financing, Argentina was experiencing rampant inflation and stagnant growth by the 1980s. It pegged the value of its currency to the American dollar. Following the change in currency regime, Argentina enjoyed a decade of low inflation and high economic growth in the 1990s. However, it never altered its spending habits. A downward spiral of increasing public debt, higher interest rates, and eventually, default, ensued.

After contracting nearly -11% in 2002, Argentina began to experience positive GDP growth again in 2003. It completed debt restructuring by 2005, and since then, public debt has experienced a downward trajectory. However, many fiscal policy reforms have remained incomplete or been reversed. Social spending has increased, and government expenditures have steadily grown since 2005, while economic growth has slowed. The government has been forced to nationalize pensions and limit currency withdrawals in order to continue its debt payments and maintain its currency's value. Consequently, the IMF expects the Argentine economy to contract in 2015 after the troubled country entered a selective default on its debt in July 2014.

This thesis seeks to determine if a negative correlation exists between Argentina's public debt and GDP in the time period following its debt restructuring (2005-2014). If Argentina's public debt proves to be negatively correlated to its GDP, it implies that even Argentina's restructured debt level has restricted its economic growth. This impediment may be due to Argentina's history of high debt and defaults as well as its current government's disdain for international markets. Either way, without lasting fiscal change, Argentina will never be able to escape the restrictions of public debt on growth. The

existence of a negative association could be significant for other countries as well. No study currently exists on the relationship between public debt and GDP growth in an individual country, especially not a country post-default. The value of this information can help countries make decisions on the lasting consequences of debt and default as well as find a sustainable balance between public debt and GDP growth. Countries with historic struggles with public debt may have lower tolerances for it, and this information may help them to adopt the policies that they need to maintain growth unconstrained by their debt burdens. This thesis seeks to provide insight into whether or not the government of Argentina found this balance between 2005 and 2014.

Chapter 2: Literature Review

2.1 The Great Depression and Soaring Public Debt

Following the Great Depression and World War II, public debt soared internationally. Economists became interested in the impact that excessive public debt would have on GDP growth, and interest in this relationship revived during the European sovereign debt crisis of 2009-2010. International policymakers agree that high public debt will be the lasting legacy of the 2008 recession and the subsequent debt crisis. Consequently, it is important to evaluate the monetary and fiscal policies that individual governments should adopt in response to spur economic growth. This relationship is of great concern to countries that are highly vulnerable to public debt, such as Argentina.

In 2001, Argentina defaulted on approximately $100 billion of public debt. During the subsequent debt restructuring, Argentina emphasized that the restructured public debt had to be reduced to a level that would not affect the country's long-term economic growth (Schclarek 2004). Due to the complex relationship between public debt and growth, literature on this topic is limited. Existing studies generally indicate that a negative, non-linear relationship exists between debt and GDP, and specific debt-to-GDP thresholds have been associated with lower economic growth. No research has been done specifically on the relationship between public debt and economic growth in Argentina.

Following its default, Argentina's debt-to-GDP ratio fell from 166% in 2002 to approximately 35% in 2006, which is below the established thresholds for a negative impact on growth (Tanzi 2007). However, this default caused Argentina to lose access to international capital markets. The country must purchase imports, service debts, and maintain the pegged value of its currency with existing foreign currency reserves. This makes Argentina highly vulnerable to increasing public expenditure simply because it cannot easily

borrow more money to repay it. Using existing research on the correlation between public debt and GDP growth, it may be possible to determine whether a negative association has existed between Argentina's growth and public debt since the default.

2.2 The Theoretical Study of Sovereign Debt and GDP

Interest in the theoretical relationship between public debt and economic growth began in the 1950s. The Great Depression and World War II left the public debt of many countries at high levels as governments spent significant amounts of money to rebuild infrastructure. This new economic situation created concern about the long-term impact of public debt on economic growth, and prominent economists began to analyze the question theoretically.

In 1958, J.E. Meade published "Is the National Debt a Burden?" in the Oxford Economics Papers. Meade compared two identical countries, one with an existing debt and one which was debt-free. He examined the potential benefits of reducing the debt for the country with existing or "inherited" debt. Meade concluded that since the owners of government bonds would already have savings, the major adverse effects of a national debt were a disincentive to work and less pressure to save money. He also theorized that higher interest rates would be required to counter the inflationary impact of less saving and additional taxes would be needed to finance interest payments, damaging economic growth.

Harvard Professor Alvin Hansen reviewed this article in "The Public Debt Reconsidered" in 1959. Dubbed "the American Keynes," Hansen supported the Keynesian idea of an active fiscal policy or using government spending and taxation to minimize fluctuations in the business cycle and unemployment. He argued that Meade had not considered the cyclical aspects of incentives. He pointed out that public debt served as structural stabilization to boost consumption during periods of recession and unemployment. In his opinion, added taxes were a benefit to the community that restrained inflation and
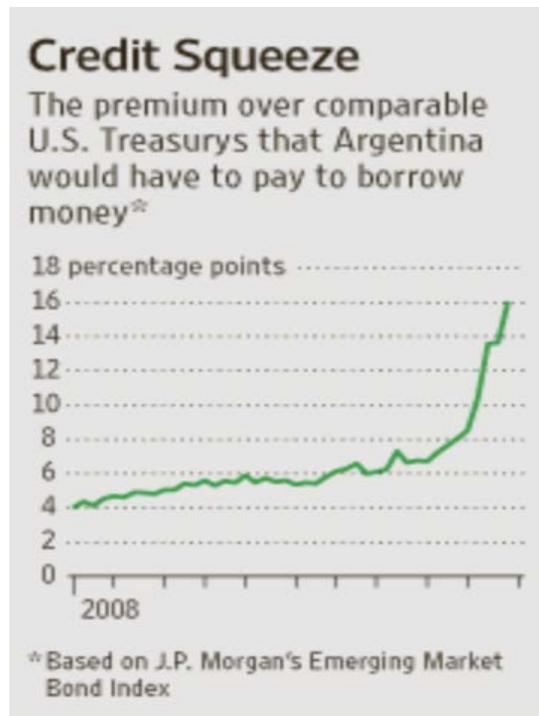
created a social safety net. Meade also had no empirical evidence of falling savings or investment, despite increasing debt levels, but the general trends in the Argentine economy support him. Foreign direct investment in Argentina did rise sharply from $8.77 billion in 1989 to $36 billion in 1997 as debt rose as well. However, investment plummeted to $2.2 billion in 2002 after Argentina's default (Tanzi 2007).

Using Hansen's Keynesian analysis, Modigliani reassessed Meade's work in "Long Run Implications of Alternative Fiscal Policies and the Burden of the National Debt" in 1961. Meade was drawing attention to what he termed "deadweight debt," which is debt incurred without creating any meaningful asset or spending that may offset debt in the future. He argued that its removal would incentivize savings and reduce the cost of taxes. Modigliani clarified that the national debt could be used to increase the current flow of available goods and services by paying with future output or taxes. In this way, it would burden future generations in the form of a reduced flow of income. As increasing deficits and decreasing public savings caused long-term interest rates to rise, private investment would become too expensive or be "crowded out." However, he conceded that productive debt-financed expenditure could contribute to future generations' real income.

As a result, Modigliani concluded that governments should run a surplus when consistent with high levels of employment to wipe out "inherited" debt. Conversely, the government should only run a deadweight deficit when it could feasibly be compensated in the future. Argentina began the twenty-first century with a calamitous default. However, domestic consumption recovered by 2003, and the nation benefited from a global commodities boom. Following Modigliani's formula for success, Argentina ran budget surpluses of 2% on average between 2002 and 2009, but government spending and subsidies also rose (Tanzi 2007).

Beginning with the global recession in 2008, the commodities boom slowed. By the end of the year, Argentina had nationalized approximately $30 billion in private pension funds, a common action taken throughout Argentina's economically dysfunctional history (Ortiz 2008). This move allowed the country to make its debt payments and maintain a fiscal surplus that year, but in the four years since 2010, Argentina's annual deficit has averaged -1.75% (Bloomberg 2015). It is increasingly clear to international observers that Argentina will not be able to repay these obligations, and the result of their uncertainty appears likely to negatively impact Argentina's economic growth. According to J.P. Morgan's emerging market bond index, the interest that Argentina would have to pay if it were to regain access to international bond markets skyrocketed following the global crisis of 2008.

Figure 1: Yield Spread between U.S. Bonds and Argentine Treasuries

Credit Squeeze

The premium over comparable U.S. Treasurys that Argentina would have to pay to borrow money*

18 percentage points

* Based on J.P. Morgan's Emerging Market Bond Index

Source: J.P. Morgan EMBI

2.3 Empirical Studies of Growth and Public Debt

Empirical research is far from unanimous, but it generally appears to support Meade and Modigliani's negative relationship between public debt and growth. In 2011, Pescatori, Sandri, and Simon of the IMF published "Debt and Growth: Is There a Magic Threshold?" Using IMF member countries dating back to 1875, they focused on the long-term relationship between debt and GDP growth. They specifically examined debt above a variety of different thresholds and corresponding growth over 1, 5, 10, and 15 year terms. They found that growth in countries with debt below 90% of GDP experience an average of 2% growth in the next year, while this number plummets to -2% in countries with debt greater than 90% of GDP.

Figure 2: Debt and Growth in the Short Run
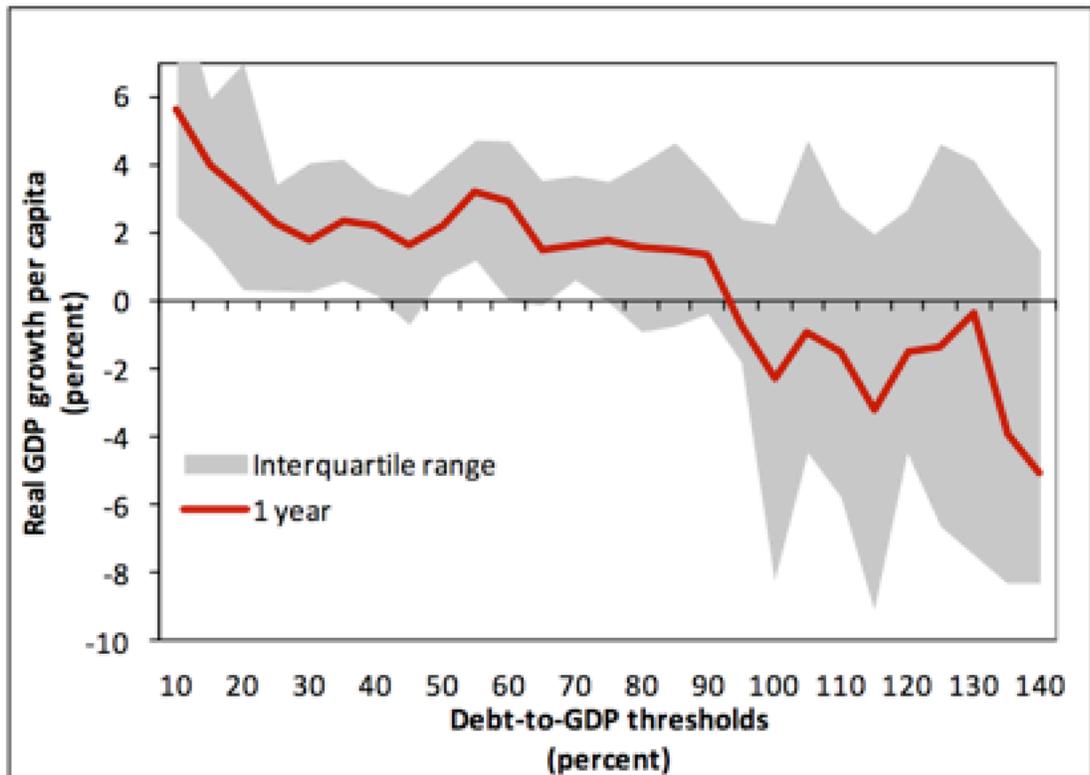
Source: Rogoff and Reinhart

They found no such association in medium or long-term growth. More importantly, they found that countries with debt above 90% of GDP that follow a declining debt trajectory grow on average as fast as their peers and grow more than countries where debt is increasing. This difference is statistically significant across the sample, and it is particularly striking between debt levels of 90% to 115%, where countries with falling debt levels enjoy an average of 0.5% higher growth. The authors failed to find a specific threshold that begins a negative association debt and growth in their sample of developed countries.

"The Impact of High and Growing Government Debt on Economic Growth" by Cristina Checherita and Philipp Rother of the European Central Bank elaborated on these findings. Using a quadratic regression equation for debt with fiscal indicators, long-term real interest rates, the exchange rate, and openness and competitiveness indicators as explanatory variables, they measured the association between public debt and growth in 12 countries in the euro area for the four decades following 1970. They concluded that a non-linear negative relationship does exist between public debt and growth with a turning point at a debt level of approximately 90-100% of GDP. They found that this effect may begin at debt levels as low as 70-80% of GDP. They determined that a correlation existed between wherein a -0.10% decrease in annual GDP growth occurred with a 1% increase in the debt-to-GDP ratio. The IMF and the ECB studies both specifically study the relationship between public debt and GDP in advanced countries.

Harvard economists Carmen Reinhart and Kenneth Rogoff have produced some of the most influential work on the relationship between public debt and GDP growth. In their 2010 paper, "Growth in a Time of Debt," Reinhart and Rogoff compiled a database of public debt and GDP growth statistics for forty-four advanced countries and emerging markets over a period of about 200 years (1790-2009). They divided this information into four categories of

debt-to-GDP ratios: below 30%, between 30% and 60%, between 60% and 90%, and greater than 90%. Using correlation statistics, median growth rates for countries with a public debt exceeding 90% of GDP were approximately 1% lower than countries with lower debt levels.

Figure 3: Argentina's GDP Growth
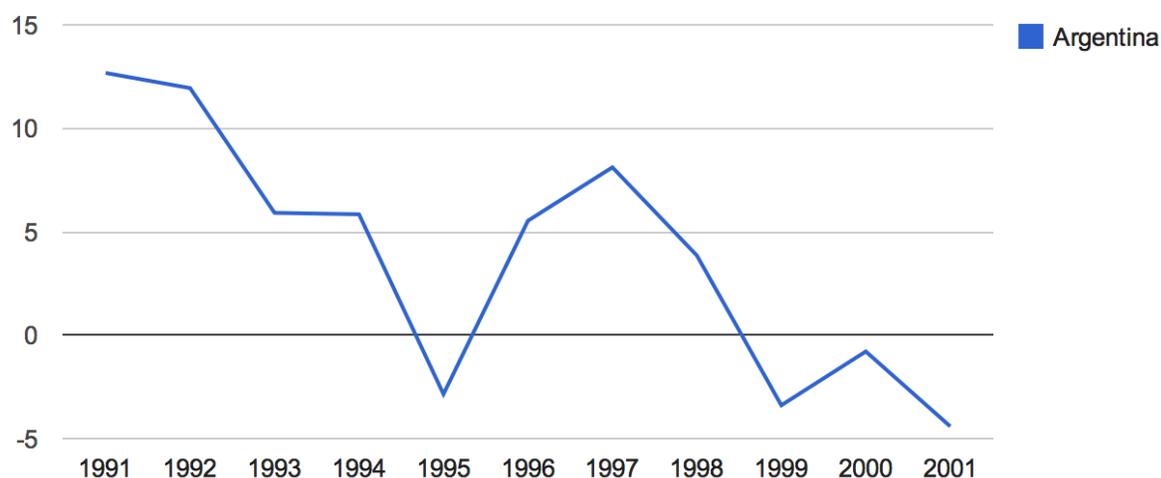
Source: IMF

In 2013, Thomas Herndon, Michael Ash, and Robert Pollin published a critique of Reinhart and Rogoff's findings. Using Reinhart and Rogoff's database, Herndon, Ash, and Pollin, disputed its criteria for data selection and the weighting of individual country observations. They argued that by excluding several periods of different countries' data, Reinhart and Rogoff misrepresented the relationship of debt and GDP. The exclusion of 1950s information from New Zealand accounted for a reduction of -0.3 of estimated real GDP percentage points from the category of countries with debt-to-GDP ratios of over 90%.

The authors also describe Reinhart and Rogoff's weighting methodology as "non-standard." For example, the U.K. was in the highest public debt/GDP ratio category for 19 years with an overall average growth rate of 2.4% per year. The United States was in this same category for four years with an average real GDP growth rate of -2.0%. These averages

would be counted equally, despite the large difference in the amount of time periods that they describe. Equal weighting in this manner gave one year of data the same importance as 20 years. When Herndon, Ash and Pollin re-evaluated Reinhart and Rogoff's data using their own prescribed method, they found an average GDP growth rate of 2.2% in the over 90% debt-to-GDP category. While this number is considerably higher than average growth of -0.1% in Reinhart and Rogoff's work, it was still 1% lower than the average growth rate in countries with less than 90% debt. It was also remarkably similar to the median growth rates Reinhart and Rogoff found. These results seem to be supported by separate study by Kumar and Woo.

Neither Reinhart and Rogoff nor the critique of their work sought to answer the question of reverse causality. In other words, they did not determine whether increasing public debt negatively impacts GDP growth or whether falling GDP growth causes governments to increase public debt to spur economic activity. IMF economists Kumar and Woo's 2010 study, "Public Debt and Growth," sought to exclude the possibility of reverse causality by using the initial level of debt and studying subsequent growth. The authors examined public debt and economic growth in thirty-eight advanced and emerging economies with populations of over 5 million people. Using five-year averages to smooth business cycles, they tested impact of initial levels of government debt on subsequent growth. They used several different regressions, including OLS and fixed effects, to eliminate different types of bias. The study found that initial debt of greater than 90% of GDP resulted in 1.3% lower growth for advanced economies.

2.4 External Debt and Reverse Causality in Developing Countries

These studies give interesting insight into the relationship between public debt and GDP, but they do not completely eliminate the possibility of reverse causality or examine

specifically external debt. External debt composed $93 billion of the amount that Argentina defaulted on in 2001. In 2002, Patillo et. al. published "External Debt and Growth." The authors used a panel dataset of 93 countries over 1969-1998 to determine the relationship between external debt and per capita GDP growth. Their model indicated that external debt had a negative impact on per capita GDP growth at levels above 35-40% of GDP and where external debt was 160-170% of exports. In this model, doubling debt levels was associated with a 1% decrease in per capita growth. The authors also found evidence of causality and reverse causality, indicating that public debt and GDP growth negatively impact one another. "External debt, public investment, and growth in low-income countries" by Clemens et al. found similar results. In a panel of 55 low-income countries between 1970 and 1999, the authors identified an external debt threshold of 30-37% of GDP or 115-120% of exports.

In 2004, Schclarek published "Debt and Economic Growth in Developing Industrial Countries." This study investigated the relationship between gross government debt and per capita GDP growth in developing countries. He also examined the relationship between external debt and per-capita growth. In a sample of 24 industrialized nations between the years of 1970 and 2002, Schclarek's results directly contradicted Pattillo. He found no evidence of a statistically significant relationship between gross government debt and per capita GDP growth. However, in a panel of 59 developing countries between the years of 1970 and 2002, Schclarek found a linear (no evidence of an inverted U-shape) negative relationship between external debt and per capita growth. Schclarek ran his model with five separate sets of explanatory variables. The fifth set used variables similar to Pattillo's variables, and it produced similar results.

All of these studies seem to conclude that a negative relationship exists between public debt and GDP growth. In Reinhart and Rogoff's analysis, they found that this relationship was

steady across developed and emerging markets. Emerging markets did experience a much stricter external debt threshold denominated in a foreign currency. At levels of external debt over 60%, GDP growth in emerging markets deteriorated. In addition, median inflation rates doubled (less than 7% to 16%) when external debt exceeded 90%. These findings logically explain the reason that over half of emerging markets' defaults on external debt since the 1970s have occurred when debt levels were at 60% or less of GDP.

2.5 Debt Risk Overshadowing Growth in Latin America

Latin America seems particularly vulnerable to the negative relationship between public debt and GDP growth. In 1997, Daniel Cohen examined suspected factors that have stalled GDP growth in Africa and Latin America in "Growth and External Debt: A New Perspective on the African and Latin American Tragedies." Using a series of variables, he found strong relationships between corruption, debt mismanagement, and openness to growth. However, using a dummy variable, he identified a 1.5% difference in expected and actual GDP growth in Latin America that could not be explained by any other variable. Cohen concluded that this variable was the risk of a debt crisis.

2.6 Public Debt's Effect on Growth in Argentina

These findings offer a unique insight into Argentina. The value of the peso was pegged to the value of the U.S. dollar during the 1990s, effectively constraining inflation. However, beginning in the 1940s, Argentina simply borrowed money from the Central Bank to fund its debt. As a result, in the 1980s, hyperinflation had reached approximately 5,000% per year. After pegging the value of the peso in 1991, the Argentine economy grew at an average of 7.9% between 1990 and 1994. Despite the fantastic growth, spending still rose as a percent of GDP, and the fiscal deficit increased over 3% in 1995. It would double by 2001. In the second

half of the 1990s, the government increasingly relied on foreign loans, denominated in dollars, and as macroeconomic conditions changed, interest rates rose.

In 1997, Argentina had to sell 6.4% of its GDP in public bonds to pay for its deficit as well as its maturing debt (Tanzi 2007). Country risk rose, and consequently, interest rates increased even more, making it more difficult for Argentina to service its debt. Argentina spent 1.10% of GDP on debt service in 1993 and 4.8% of GDP on the same thing in 2001. Revenue had to be reallocated from expenditure, affecting GDP growth. Average GDP growth between 1995 and 2000 declined to 1.74%. When Argentina defaulted in 2001, its debt-to-GDP ratio was over 150% (Tanzi 2004).

It is undoubtedly true that Argentina remains a unique economic case today. It enjoys some of the most fertile land and largest stores of natural resources in the world, but a century of economic management has resulted in a vicious cycle of debt. Given Argentina's history of debt and default, the 2001-2002 crisis was a predictable event. Argentina never fixed many of the underlying policies that led to high debt and stagnant growth in the previous decades. Following the default, Argentina restructured its debt to less than 90% of GDP. Its debt trajectory has fallen to approximately 23% of GDP in 2014, and external debt as a percent of GDP has fallen to approximately 16%, less than the lowest threshold that any study associates with any impact on growth (Bloomberg 2015). According to the majority of the body of research on this topic, these falling debt levels should have little or no significant impact on growth. However, as Cohen argued, a history of debt crises could create an impediment to growth. Given Argentina's history, this thesis argues that even its restructured public debt has had a negative impact on its economic growth between 2005 and 2014.

Chapter 3: The Baring Crisis

This chapter describes the Baring Crisis of the 1890s and its striking similarities to Argentina's default in 2001-2002. The Baring Crisis is only one part of Argentina's long history of sovereign defaults, excessive spending, and unsustainable pubic debt. However, if public debt had a lasting impact on Argentina's economic growth, it was not evident at the time of the Baring Crisis or early in the 20th century. Argentina enjoyed one of the fastest rates of economic growth in the world before and after the Baring Crisis.

In 1880, Argentina established its first strong federal government in Buenos Aires under Julio Roca. At that time, the country's currency consisted of depreciated peso notes issued by a variety of provincial governments and national banks (Mitchener et al. 2007). In order to spur economic development, the central government created a national currency in 1881. It minted gold and silver peso coins and replaced old peso notes with "metallic" pesos. These notes could be traded for gold at par value, bringing Argentina on to the Gold Standard. Capital investment from Europe, especially London, flowed into the country earmarked for infrastructure projects. Railroads made it easier to export agricultural products, and trade profits rose (Mitchener et al. 2007). The circumstances that led to Argentina's sovereign default in 2001 a century later are analogous to the Baring Crisis. Argentina pegged its currency to the U.S. dollar, and the stable money supply facilitated foreign investment.

With no Central Bank to regulate the currency, a gold premium developed by 1885, and the value of peso notes began to depreciate. In 1887, Argentina passed the Law of National Guaranteed Banks. This law allowed banks that met capital requirements to issue paper peso notes backed by government gold bonds, but these bonds were not convertible to gold. Argentine banks purchased these notes with loans from European financial markets, and they became gold liabilities to the Argentine government. By 1890, provincial banks had

issued more than 30 billion pounds of debt on foreign capital markets. As long as foreign investors purchased Argentine bonds and additional notes were 100% backed by specie, the system was sustainable. From 1884 until the Baring Crisis in the early 1890s, the monetary base grew at 18% annually and the inflation rate averaged 17%. Paper notes depreciated each year at an average rate of 19% (Mitchener et al. 2007).

The federal government borrowed extensively abroad as well. Between 1885 and 1890, about 710 million gold pesos poured into the Argentine Republic. Argentina was the world's fifth largest sovereign borrower (Mitchener et al. 2007). In 1889, Argentina accounted for between 40-50% of all of the United Kingdom's lending abroad, and between 1884 and 1889, Argentina's current account deficit reached an average of 20% of GDP. By the late 1880s, 40% of foreign borrowing was required to service the growing debt. The gold premium on paper pesos reached 94% in 1889. A devaluation of the peso would devastate Argentina's ability to pay its gold debts (Mitchener et al. 2007).

The same sequence of events occurred in the late 1990s. Argentina sold billions of dollars in debt denominated in foreign currencies. With the value of the peso pegged to the U.S. dollar, it could pay its debts in pesos. However, the government needed a reserve of dollars to make interest payments and defend the value of its money supply domestically. As Argentina's debt grew, default risk and interest rates on the debt rose. Eventually, the government no longer had sufficient reserves to do both.

Similarly, in 1889, the government broke its promise of redeeming paper notes for gold and paid some of its debt with paper notes. Investors in Europe stopped buying Argentine bonds and dumped Argentine pesos. The government deployed the gold that backed the paper notes to defend the exchange rate. As in 2001, by the end of 1889, the Banco Nacional no longer had enough gold to continue to intervene in the currency market. Social

unrest began, and real wages fell as the price level rose. Uncertainty further spooked investors, and multiple bank runs began in 1890 (Mitchener et al. 2007).

Barings Bank in London had underwritten many of Argentina's debt issues. Unable to meet its obligations, the behemoth bank turned to England's Central Bank for aid. European governments banded together to form a rescue fund. The British government's intervention saved the European markets from contagion, but South America had no safety net. In 1890, Argentina defaulted on 48 million pounds of debt. A severe banking crisis resulted in January 1891. Argentina's real GDP fell by -11% between 1890 and 1891 (Mitchener et al. 2007).

As previously noted, the crisis in the early 1890s had little lasting impact on Argentine growth. Between 1880 and 1905, GDP growth averaged 8% annually, and GDP per capita rose from 35% of the per capita GDP of the United States' to 80%. Its GDP represented 50% of all of Latin America, and its trade represented 7% of the world's total (Tanzi 2007). Between 1890 and 1939, Argentina's GDP per capita was comparable to the same measure in France, Germany, and Canada. Argentina's growth slowed after World War I, when England's inflow of investment was staunched. The Great Depression further hurt Argentina's terms of trade, and GDP contracted by a quarter. Yet Argentina abandoned the reestablished Gold Standard by the end of 1929, and output regained its 1929 level by 1935. While the Argentine recovery was mainly complete by the mid-1930s, the government adopted import substitution policies, paving the way for Juan Peron's administration (Singerman 2015). If no negative correlation between Argentina's public debt and GDP growth existed before the 1940s, it may have become engrained in the economy afterward.

Chapter 4: La Decada Perdida

This chapter describes the economic events of the 1980s. As a result of Peronist policies from the 1940s, Argentina experienced a decade of slow and negative growth in the 1980s compounded by spiraling debt. The actions of successive Argentine administrations and the economic problems of the 1980s led to the establishment of convertibility in the 1990s and eventually, the crash of 2001. These disastrous economic policies began when Juan Peron became Argentina's president in 1946. A believer in autarky and fascist corporatism, Peron aimed to organize Argentine society into state-controlled unions and trade associations with collective bargaining power. At the center of this system, the government controlled all aspects of the economy (Singerman 2015). The result of his policies was decades of stagnant growth and uncontrollable public debt.

In order to achieve its goals, the government nationalized the Central Bank of Argentina and all bank deposits, taking control of the money supply and the allocation of credit. By nationalizing bank deposits, all deposits in private and state-owned banks were received by the Central Bank, and all other banks needed in order to borrow from the Central Bank to make loans. The government decided what businesses received financing (Singerman 2015). In pursuit of autarky, Peron began directing profits from agricultural exports toward industrial development, and the government established monopolies over Argentina's exports and imports. Favorable trade surpluses from World War II allowed Peron to pursue these measures as well as a massive program of public expenditure focused on social spending and nationalizing industries and services (Singerman 2015).

International agricultural prices declined by the end of the 1940s, limiting the Peron's ability to fund his rapidly expanding expenditures. Inefficient management of nationalized businesses created staggering deficits. State-owned banks, and eventually the Central Bank,

were forced to finance the accruing public debt through loans. By December 1948, Argentina's gold and foreign reserves had fallen from $1.1 billion in 1946 to $258 million, and Argentina owed $200 million to American banks (Singerman 2015). The Central Bank financed Argentina's public debt by printing money, and the government instituted protectionist measures and domestic subsidies to foster self-sufficiency. However, by the end of the 1940s, these measures were no longer sufficient to protect and foster domestic industry. The government began to use devaluation to make foreign goods comparatively more expensive (Singerman 2015). The ultimate result was the expensive protection of unproductive industries and mismanaged workers.

High public debt and stagnant GDP growth were the main consequences of Peron's administration. Inflation became an institutionalized problem as the government sought to finance their debt and spur domestic growth. The inflation rate peaked at 33.66% in 1949 (Singerman 2015). In order to pacify the unions that supported him, Peron would periodically decree salary hikes to balance inflation. With monopolies controlling trade and no corresponding rise in worker productivity, higher prices and more inflation were the only results. The accumulated inflation rate between 1946 and 1951 was 297.57%. In 1946, the government had ended the part of the Central Bank's mandate that prohibited it from advancing the federal governments funds greater than its average tax collections from the last three years (Singerman 2015). Peron and later administrations could now finance its increasing debt through the creation of money.

Between 1976 and 1983, a military dictatorship ruled Argentina. Under their economic administration, annual inflation reached 434%, and in 1983, inflation reached an annual rate of 4,924% under the civilian government of President Raul Alfonsin (Singerman 2015). Between 1981 and 1989, Argentina's foreign debt doubled. Its rising debt was constantly

being refinanced by the IMF, which demanded policy changes in order to support short-term interest payments (Tanzi 2007). Foreign debt repayment further eroded Argentina's worsening fiscal position.

Alfonsin's administration began to tackle these challenges with state control of credit, exchange rates, and prices. Workers' earnings improved, small businesses could gain easy credit, and social programs were enacted. However, by 1985, foreign creditors were exerting pressure, and high inflation was turning into hyperinflation. The annual rate of price increases had reached 6,000%, and it was still rising (Sachs 1990). On May 14th, 1985, the government announced the Austral Plan. It froze wages, prices, and public utility rates, and it fixed foreign exchange and interest rates to control inflation and speculation. The austral was introduced as the new currency with the value of 1,000 pesos to 1 austral. The Plan appeared to work effectively. It halted inflation without increasing unemployment or decreasing economic growth more (Sachs 1990).

By the end of 1985, current account deficits were a problem, and a consumption boom was underway. Inflation returned. By April 1986, the government was forced to enact austerity policies. In August 1988, amongst increasing social unrest and political divisions, the government launched the Primavera Plan (the Spring Plan). The government added the intention to decrease the deficit, a condition for continuing foreign credit, to its traditional tactics of price, salary, and public service freezes (Sachs 1990). Despite its many efforts, the Argentine government failed to find a balance between public debt and sustainable GDP growth between the 1940s and the 1980s. Stagnant growth and high public debt had become defining characteristics of the Argentine economy. External debt as a percent of GNI peaked at 93.33% in 1989, and GDP contracted by -7.5% (Bloomberg 2015).

In the beginning of 1989, the IMF and the World Bank announced that they would no longer supply credit to Argentina. Argentina's system of refinancing debt and staying afloat collapsed. On February 6th, 1989, the Argentine government announced the peso's devaluation (Romero et. al 2013). Hyperinflation arrived in the country, devouring savings, destroying real wages, and sending prices skyrocketing. Carlos Menem, a Peronist strongman, won the May elections. Alfonsin resigned in July 1989, six months before his term ended, speeding up the transfer of power (Tanzi 2007).

Chapter 5: La Fiesta Menemista

This chapter describes "la fiesta menemista" of the 1990s, named for the Argentine president of the time, Carlos Menem. During this decade, Argentine economic growth skyrocketed with the establishment of a pegged currency regime. Despite the growth, Argentine spending and public debt rose. Since Argentina could not risk inflation by borrowing from its Central Bank, it was forced to borrow money abroad. This growing debt led to higher default risk and rising interest rates. The expanding debt corresponded to slowing growth by the second half of the 1990s.

Carlos Menem became president of Argentina on July 9th, 1989 (Romero et al 2013). Following a decade of high debt and negative growth, the economy was the biggest challenge to his government. The average GDP growth rate between 1980 and 1989 was -0.73% (Bloomberg 2015). Due to borrowing from the Central Bank to finance its debt, inflation reached 200% in July, and by December, it remained over 40%. Menem faced the clear necessity of spurring economic growth and controlling Argentina's debt without printing money. In 1991, Menem passed the Law of Economic Emergency, suspending a variety of subsidies and authorizing the dismissal of public employees (Cohen 2012). Argentina also adopted many of the IMF's suggestions. Its GDP contracted by -2.4% again in 1990, but external debt fell to 46.25% of GNI (Bloomberg 2015).

Menem appointed Domingo Cavallo, a Harvard Phd, as the Minister of the Economy, and Cavallo introduced the Convertibility System in 1991. Inspired by Argentina's success in the early 1900s, the system set the exchange rate at one peso to one U.S. dollar. Under the new currency regime, the government could not borrow from the Central Bank, although it could borrow from foreign sources. As a result, GDP growth rose to 12.67% in 1991 (Tanzi 2007).

External debt fell as a percentage of GDP from 34.6% in 1991 to 24.1% in 1995, and GDP grew for four consecutive years (Bloomberg 2015). However, Argentina's fundamental fiscal policy did not improve. Growth in GDP and revenue were partly attributable to favorable macroeconomic conditions and revenue increases. The decline in inflation stopped revenue from losing value between the time it was owed and the time it was collected, and imports, an important source of tax revenue from import duties and the value-added tax, grew from $4 billion in 1990 to $14 billion in 1992. The proceeds of privatizations, one time spikes in revenue, were also misleadingly attributed to growth (Tanzi 2007).

Under these optimistic but precarious circumstances, Argentina entered a brief golden period. By 1994, the country had enjoyed five consecutive years of an average of 7% GDP growth. The annual inflation rate fell to 4%. Tax revenue as a share of GDP rose to a record high of 22% of the growing GDP, a 6% increase from its share in 1989. As GDP rose sharply, public sector spending, measured as a share of GDP, also grew, due to increases in pensions and higher transfers to the provinces. Despite revenue increases, Argentina still had a public sector fiscal deficit of 2% (Tanzi 2007).

Figure 4: Argentina's Public Sector Debt (1990-2002)
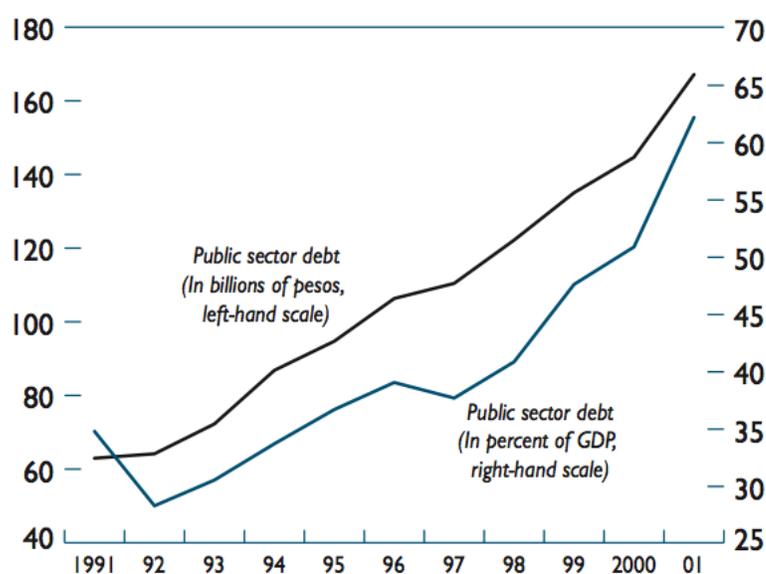
Source: IMF Database

After 1994, Argentina's economic situation began a slow but definite deterioration. Unemployment increased due to privatization. New owners shed approximately 40% of their workforce, and rigid labor laws and high social security taxes on employers prevented the growth of the first five years of the decade from adding many new jobs to the economy. Globally, the dollar's rise in value made it more difficult to maintain the necessary reserves to guarantee convertibility. The fiscal deficit rose to over 3% of GDP (Tanzi 2007). Since Argentina had not been able to turn to the Central Bank for financing, it went to external sources. Debt was increasing, and GDP growth began to stagnate.

Argentina's GDP contracted by -2.85% in 1995, partly due to contagion from the Tequila Crisis in Mexico. Many people at the time supported a devaluation of the peso. However, external debt as a percent of GDP grew from 24.1% in 1994 to 43.7% in 1999, and

devaluing the peso would greatly increase the cost of servicing foreign debt (Bloomberg 2015).

Figure 5: Money Market Interest Rates for Argentina (1991-2002)
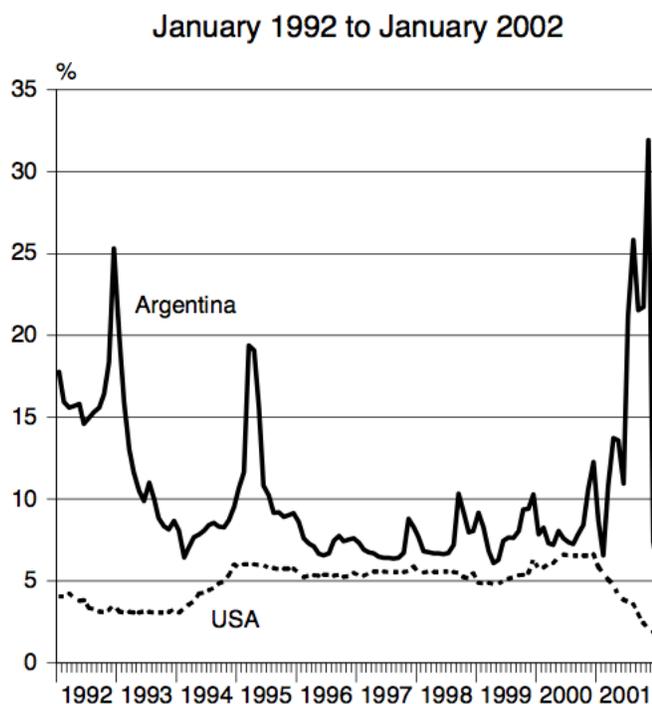
Source: IMF, OECD, BCRA (Central Bank of the Argentine Republic)

After 1995, GDP growth resumed at a slower rate. Average GDP growth fell to 2.25% between 1995 and 1999. Tax revenue remained low, and, in 1996, the personal income tax accounted for less than 1% of GDP. Unemployment, which had hovered between 7% and 8% from 1989 to 1992, grew to 10% between 1993 and 1994. It reached 17-18% by 1995-1996, and the government's reliance on foreign loans continued growing (Tanzi 2007).

The public sector deficit grew by over 3% of GDP on an accrual basis between 1994 and 1996, and it doubled between 1996 and 2001. Tax revenue rose by about 2% of GDP from the end of 1996 to 2000, but dramatic increases in public spending mitigated this effect. In order to afford replacing its maturing debt and the deficit, the Argentine government had to

sell 6.4% of its GDP in public bonds in 1997 (Tanzi 2007). Its country risk and associated interest rates were continuously rising, partly due to contagion from the emerging economic crises in Asia and Brazil. Financing the deficit and public debt was growing more expensive, and Argentina had exceeded the fiscal deficit targets that it set with the IMF in every year since 1994 (Tanzi 2007).

In 1998, the IMF created an Extended Fund Facility Arrangement with Argentina. This deal made large amounts of money available to Argentina in case of an emergency, such as preventing contagion. Public spending still rose dramatically in 1998 to fund Carlos Menem's reelection campaign, and the difference between actual resources and spending was still being funded by increasingly expensive foreign loans (Tanzi 2007).

In March 2000, the IMF and Argentina agreed to a SBA or Stand By Arrangement or a line of credit contingent on the government meeting certain stipulations. The agreement was worth $7.2 billion, and its intention was to reassure the fickle market to continue financing Argentina at more reasonable interest rates. This amount would grow to $13.7 billion in January 2001 and to $22 billion in September 2001 (Tanzi 2007). Argentina's spending never translated into sustained GDP growth, and Argentina's increasingly expensive public debt led to its default in 2002.

Chapter 6: Las Villas Miserias

Las villas miserias refer to shanty-towns erected in Buenos Aires. Newly poor Argentines inhabited these slums after losing savings, employment, and homes in the default and currency devaluation of 2002. This chapter describes the crisis and the remedial economic measures that Argentine undertook in order to recover. The crisis officially began in December 2001. Argentina was due to receive a $1.24 billion installment from the IMF, pending an IMF review of Argentina's progress. The government desperately needed cash to service its debt, and the IMF payment would serve to reassure capital markets of Argentina's solvency (Tanzi 2007). Argentina's Convertibility System allowed Argentines to use both currencies interchangeably. Millions of Argentines had taken out loans in dollars, but they received their incomes in pesos. Devaluation would destroy their ability to pay these debts as well as the government's ability to pay its foreign debts.

Economy Minister Domingo Cavallo attempted to strengthen Argentina's fiscal situation by cutting government salaries and pensions. However, total public debt had still risen. The Argentine government's own forecasts showed that it would exceed the budget deficit target that it had agreed upon with the IMF. The market lost confidence that Argentina would be able to pay the principal and interest on its $140 billion public debt, and GDP contracted by -3.39% in 1999 (Bloomberg 2015).

Capital flight had already been a problem as an estimated $18 billion left the country in 2001, but it began to skyrocket as thousands of depositors pulled over $3.6 billion or over 6% of all deposits out of banks. On December 1st, the Ministry of the Economy restricted all cash withdrawals to $250 per week in an event known as the corralito to preserve dollars. Money transfers abroad that were unrelated to trade were also banned (Tanzi 2007). On December 3rd, the IMF withdrew its support on the evidence that the corralito destroyed the

Convertibility System's guarantee of interchanging dollars and pesos. After declaring a state of emergency, President Fernando de la Rua was forced to resign on December 21st, 2001 (Cohen 2012).

Figure 6: Argentina's Foreign Currency Reserves (2000-2001)
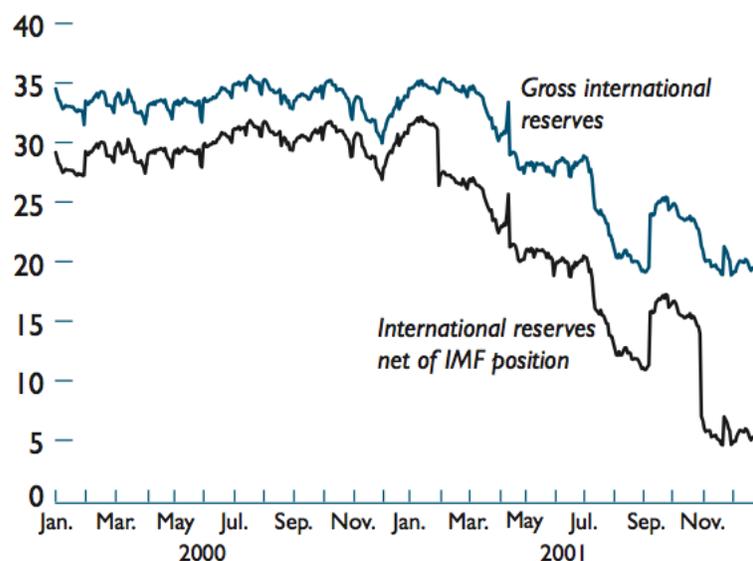
Source: IMF database

The provincial governors nominated Adolfo Rodriguez Saa as the temporary president. Saa made the bold decision to suspend payment on Argentina's external debt on December 23rd, 2001, sending the country into an official default. After a week in office, Saa resigned as well. Former Vice President Eduardo Duhalde was chosen as president near midnight on January 1st, 2002. During his first speech as president on January 1st, 2002, Duhalde declared, "Argentine is bankrupt, but it has a future" (Cohen 2012).

On January 3rd, 2002, Duhalde devalued the peso, ending convertibility. He established a dual exchange rate of a free floating rate for most operations and AR$1.40 pesos to $1.00 USD. The same month, the government announced the pesificacion of the economy, converting all dollar deposits to pesos at the rate of 1.40 pesos to USD $1.00 (Cohen 2012).

He passed the Economic Emergency Law on January 5th, 2002, which froze all rents and contracts for 180 days. The law gave the state the power to fix maximum prices on necessary goods, including medicine and fuel. The government loosened the withdrawal limit on January 17th, and the Supreme Court struck this part of the law down in the beginning of February. At this time, the peso was worth US $0.50, and it continued to depreciate until it reached 4 pesos to US $1.00 in May 2002. It eventually settled at a value of 3 pesos to US $1.00 by October 2003 (Cohen 2012).

The Duhalde administration implemented extreme fiscal austerity into the 2002 budget. Over 800 million pesos were cut from the budget for public institutions. The government planned to pay interest on a small portion of its external debt while increasing taxes. An IMF mission demanded a further $3.5 billion in budget cuts, focusing on the provincial debts. However, half of the Argentine population had already fallen below the poverty line, and unemployment had risen to 56.8% in 2002 (Cohen 2012). When Argentina's Minister of Economy resigned in mid-April, Duhalde eventually replaced him with Roberto Lavagna, a Peronist economist who had served in the Alfonsin administration in the 1980s (Cohen 2012)

Lavagna made many major steps of reform. These steps included beginning economic and legal reform on bankruptcy, paying $680 million in arrears to the World Bank, and reopening currency markets with a floating exchange rate and moderate interference by the Central Bank. He also ended restrictions on market operations for banks, stocks and bonds, and futures (Cohen 2012). The pesificacion increased the money supply, and the government managed the risk of hyperinflation through freezing deposits and utility prices. Inflation dropped to zero by the end of the year. Devaluation caused imports to fall from an average of

US$28.1 billion from 1997 to 2000 to US$9 billion in 2002, while exports remained at around US$25.3 billion (Tanzi 2007).

Unemployment had been a problem in Argentina since before the crisis. Between 1995 and 2000, 4,600 small and medium-sized businesses closed between 1995 and 2000 in addition to 167,500 jobs lost during privatization. In the first four months of 2002, private companies cut a further 83,000 jobs. Real wages decreased sharply while extreme poverty rose from 6% to 28% in terms of ability to afford the basic food basket. As Lavagna sought to address unsustainable public expenditures, the government balanced austerity with wealth transfers to the newfound poor (Cohen 2012). Argentina's GDP contracted by -4.41% in 2001 and by -10.89% in 2002 while public debt peaked at over 150% of GDP (Bloomberg 2015). Argentina's full debt principal and its interest payments would crush economic growth without economic reform. The Argentine government began the long process of debt restructuring. The stated purpose of debt restructuring was to eliminate the negative correlation between public debt and GDP growth that seemed evident in Argentina since the 1940s.

Chapter 7: Argentine Recovery

This chapter describes the economic situation in Argentina for the last decade. It begins with the crisis and ends with the current state of the Argentine economy. After contracting in 2000 and 2001, Argentina's GDP fell by -10.89% in 2002. Public debt peaked at approximately 160% of GDP (Tanzi 2007). However, the Argentine economy began growing substantially the next year, and real GDP growth averaged 6.63% between 2003 and 2005. This surge in growth was partly the result of the economy regaining consumption and output lost during the crisis. Debt fell to approximately 85% of GDP after restructuring was completed in 2004. Argentina's debt restructuring was the largest in history until the Greek debt restructuring of 2012 (Cohen 2012).

In 2006, four years after the default, Argentina's per capita GDP regained its 1998 level, and total GDP was 12% higher than in 1998. According to IMF estimates, the Argentine economy grew 94% between 2002 and 2011, making it the fastest growing economy in the Western Hemisphere during this time frame. Poverty fell from over one half of the Argentine population to about one-seventh of the population in the beginning of 2010 (Cohen 2012).

While many attribute Argentina's economic growth to the commodities boom in the first decade of the 21st century, domestic consumption drove Argentina's rapid recovery. Prices stabilized and real wages began to grow in the fourth quarter of 2002. Investment grew by 40.9% and contributed to 55% of the growth in GDP (Kozameh et al. 2011). The commodities boom was fortuitous, but exports contributed much less to Argentina's recovering growth rate. In 2005 and 2010, exports peaked at 1.8% of GDP. Cumulatively, exports contributed approximately 12% of the expansion's growth. Inflation remained under 1% for the next two years, and the peso's devaluation spurred exports and employment

(Kozameh et al. 2011). Argentine producers immediately took advantage of the comparatively cheap domestic goods.

Successful bond and debt restructuring further aided Argentina's fiscal and economic situation after its 2002 default. When Nestor Kirchner took office as president in May 2003, Argentina's total debt was approximately $190 billion. If Argentina began debt repayment in June 2003, it would have cost the country $40 billion before the beginning of 2004 (Romero et al. 2013). This amount would have exhausted all foreign reserves and left Argentina still in debt. On September 10th, 2003, the IMF accepted Kirchner's offer to reschedule payment on its debt to the IMF, and in December 2005, Argentina prepaid its outstanding obligation to the IMF of about $9.7 billion. This payment ended further IMF supervision and saved Argentina an estimated $10.3 billion in debt repayments between 2006 and 2008 (Tanzi 2007).

In January 2005, Argentina made its final debt restructuring proposal. The plan included a reduction of 75% of the face value of bonds. By March 2005, 76.1% of Argentine bondholders had accepted the proposal. Over 90% of bondholders would later accept the deal as well (Cohen 2012). The deal introduced several new types of bonds, including ones tied to GDP performance. The final reduction in debt was $64.8 billion from $191.3 billion to $126.5 billion, and Argentina's debt to GDP ratio fell from 126% of GDP in 2004 to less than 33.33% of GDP in 2006 (Hornbeck 2004). The remaining bondholders, who hold about $23.4 billion in Argentine bonds, are continuing to pursue full repayment through American courts (Cohen 2012).

In July 2014, fondos buitres ("vulture funds") that hold bonds from before its 2002 default pushed Argentina into a selective default. These are the bondholders who refused to accept the restructured bond values. Led by Aurelius and Elliot Management, the holdout bondholders obtained a court order that forbids the Bank of NY from paying dividends with

money that Argentina deposited for that purpose. The deposited funds were earmarked for bondholders who accepted the restructuring. The Supreme Court declined to hear the case, meaning the lower court's ruling remains in effect. However, bondholders who accepted the restructuring, led by George Soros, are suing the bank involved, and Argentina is suing the United States in the International Criminal Court for violating its sovereignty. Argentina's government is also trying to pass legislation that would allow it to pay its bondholders in pesos or in another way that would not require American institutions.

Despite Argentina's debt restructuring, it has been excluded from global bond markets since its default in 2002. For this reason, its main source of reserve currencies is its bountiful natural resources. Blessed with fertile farmland, shale gas, and plentiful livestock and seafood, Argentina greatly benefited from the commodities boom between 2000 and 2009. While exports did not make a large contribution to Argentina's growth during this period, they certainly played an important role in debt repayment and building Argentina's foreign reserves. Argentina's international reserves rose from $10.5 billion in 2002 to $19.6 billion in 2005 and $28.2 billion in 2014. In the three-year period between 2010 and 2013, the amount of goods that Argentina shipped abroad increased by 37.7%, making Argentina the world's 44th largest exporter. In 2013 alone, Argentina shipped $76.6 billion of good abroad ("Top Argentine Exports to the World" 2014).

Figure 7: Argentine Exports (1999-2011)
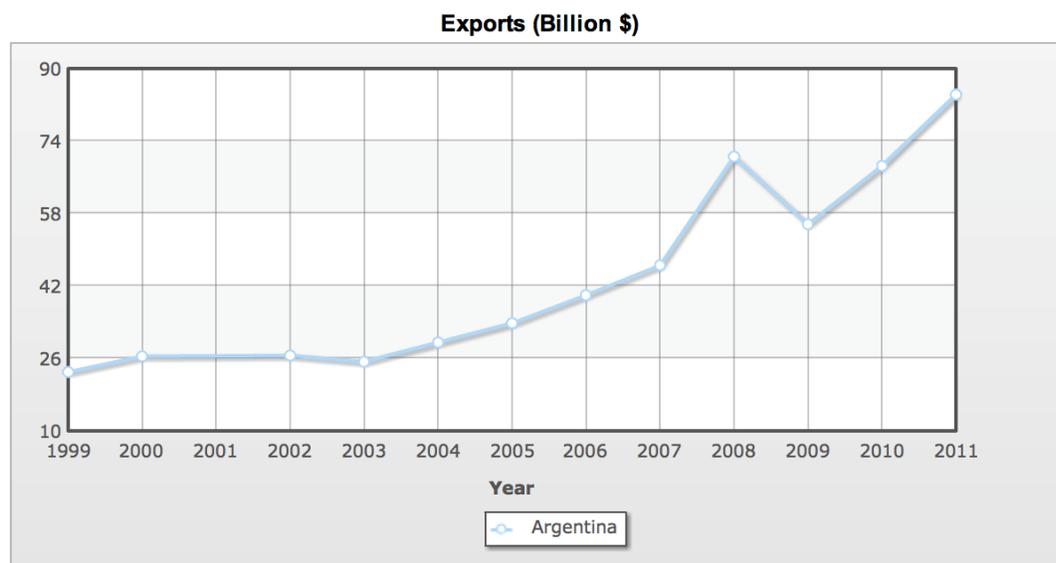
Exports (Billion $)

Country	1999	2000	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Argentina	23	26.5	26.7	25.3	29.57	33.78	40	46.6	70.59	55.67	68.5	84.27

Source: BCRA

Brazil, China, and the United States are the largest destinations of Argentine exports. These three countries bought 34% of Argentina's exports in 2013 and 33% in 2014 ("Top Argentine Exports to the World" 2014). However, growth in the global market is projected to stagnate in 2014-2015. China's total exports dropped YOY by 20% in January 2015. Its GDP growth is expected to decline from a quarter century low of 7.4% in 2014 to 6.8% in 2015 and 6.3% in 2016 ("Chinese Imports Crash & Worst January Export Plunge Since 2009 Sends Trade Surplus to Record High" 2015). In January, Brazil's Central Bank reduced its 2015 GDP growth forecast from 0.38% to 0.13% ("Brazil's Central Bank Reduces GDP Growth Forecast for 2015 to 0.13%" 2015).

Argentina's export market still has great potential. U.S. imports are projected to rise by 6.9% in 2015, and the U.S. Department of Agriculture's Buenos Aires desk has raised its export projections above the USDA's estimates (MAPI Forecast 2014). Anticipating that the end of President Cristina de Kirchner's term will mean the end of export taxes and restrictions, the Department is estimating that Argentina will export 6.5 million tons of wheat (500,000 tons above the USDA's estimate) and 13.5 tons of corn (1.5 million tons above the USDA's projections) in the 2014-2015 season ("Argentina's Elections Could Boost Corn, Wheat Exports" 2015).

Many of Argentina's recent export figures underline the feasibility of these projections. During the 2014-2015 season, Argentina is on track to produce a record amount of 58 million tons of soybeans. The Rosario Grains Exchange recently increased this estimate from 54.5 million tons due to favorable weather ("Argentina's Elections Could Boost Corn, Wheat Exports" 2015). Argentina also exported $1.6 billion in seafood in 2014, representing a 6.6% increase in revenue from 2013 ("Argentine Seafood Exports Reach $1.6bn Dollars in 2014; Squid and Shrimp Main Items" 2015). Argentina has also deployed a trade mission to Russia. It sees the opportunity to triple its exports to Russia in 2015 (reaching $1.8 billion USD) due to Western sanctions ("Argentina to Triple Exports to Russia in 2015" 2014).

Despite optimistic circumstances, inflation returned to haunt Argentina in 2005, reaching 12.5%. Argentina borrowed dollars from the Central Bank to prepay the IMF. This decision was a return to the Peron era policies that led to high debt and inflation. Between 2004 and 2006, social spending caused total public spending to increase by 2% of GDP, despite GDP growth (Tanzi 2007). Devaluation and economic growth made temporary tax measures possible, but the resulting revenue accounted for all primary surpluses that

Argentina had in 2005 and 2006. Meanwhile, expenditure cuts in real wages and investment are likely unsustainable (Tanzi 2007).

By 2008, commodities prices were falling. The government expected to lose nearly $6 billion in tax revenue from agriculture in 2009. In order to make $22.4 billion in debt obligations and other payments in 2009, Argentina nationalized approximately $30 billion in private pension funds. President de Kirchner announced that the nationalization would protect retirees from falling stock and bond prices in the global recession (Ortize 2008). After the government's announcement, local stocks dropped 23%, and locally traded bonds dropped 11%. Many Spanish companies with large investments in Argentina also experienced the fallout. Shares in Spanish bank Santander, the euro zone's largest bank, fell by 9.9%. The Spanish oil company Repsol, which controls YPF in Argentina, saw its shares fall by 15.8%. At the time, Argentine Planning Minister Julio de Vido apparently assured Repsol that its Argentine investment was safe (Ortiz 2008).

Ironically, President Christina de Kirchner nationalized Repsol's majority share in YPF in 2012. Founded as a state oil company in the 1920s by the Argentine government, YPF was privatized in the 1990s. Repsol purchased it. The Spanish company lost one-fifth of its annual profit as a result (Gray et al. 2014). However, Argentina's circumstances have changed dramatically between 2012 and 2014, and the Kirchner administration is now quietly encouraging foreign investment in fuel exploration and production.

In February 2014, the government settled legal claims with Repsol for $5 billion in the form of the nominal value of three sovereign bonds. The company will also be eligible to receive up to an additional $1 billion in bonds (face value) to compensate for the market discount on the first three bonds. The total market value of the package is a minimum of $4.67 billion (Gray et al. 2014).

In addition to settling Repsol's claims, the Argentine government has also passed federal legislation to harmonize provincial economic incentives and legislation for drilling throughout the country. New tax proposals will reportedly introduce a flat rate for taxes and levies collected by local governments for exploratory and excavation work ("Argentina Working on New Hydrocarbon Tax" 2014). The amount of investment required to receive tax investments would be lowered from $1 billion to $250 million. Companies that qualified would be allowed to transfer dividends abroad and export 20% of extracted hydrocarbons tax-free after 5 years of investment. Limits on exploration machinery and equipment would also be eliminated. Furthermore, foreign companies would no longer be required to set up joint ventures with local firms for exploratory work, which frequently results in unnecessary costs ("Argentina Working on New Hydrocarbon Tax" 2014).

Structural challenges remain for Argentina. Since 2007, Argentina's government has reported its inflation figures as between 5 and 11%, despite all economic indicators and predictions. In early 2013, Argentina became the first country to be censured by the IMF for inaccurate inflation and economic growth data, which could lead to expulsion from the IMF (Singerman 2015). The Argentine economy ministry predicted less than half of the 28.4% inflation that private economists predicted for 2014. The IMF forecasts that annual inflation will reach 40% in 2015 (Singerman 2015). Compounded by inflation and unemployment, Argentina is ranked second on the 2015 country misery index (Bloomberg 2015).

Table 1: Argentina's Inflation

Year	Annual Inflation Rates per Argentine Government	Annual Inflation Rates per Private Consultants
2007	8.4%	24.9%
2008	7.2%	22.8%
2009	7.7%	15.5%
2010	10.9%	25.2%
2011	9.5%	22.6%
2012	10.8%	25.3%
2013	10.9%	28.3%

Source: Forbes Magazine

Figure 8: 2015 Country Misery Index

The countries with the saddest projected rankings in the misery index for 2015
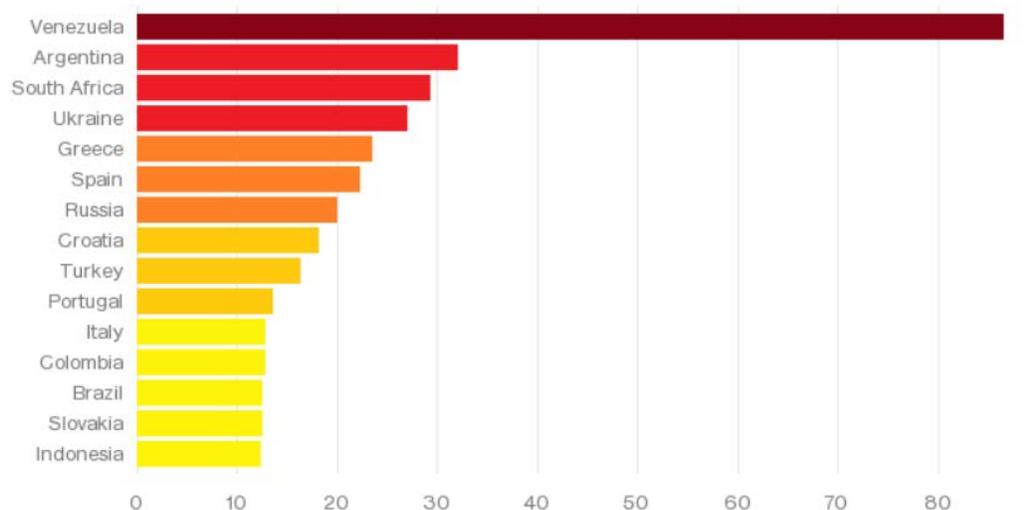
Source: Bloomberg News surveys.

Bloomberg

Source: Bloomberg News Surveys

In 2011, dollar reserves were at a record high of $52.6 billion, but they had fallen to $29.3 billion in early 2014. Exchange controls on multinationals' repatriation of earnings, taxes on online spending and credit card purchases, regulations on holding savings in dollars, and limits on tourists' spending all failed to stem the hemorrhage of dollars leaving Argentina.

Throughout 2013, Argentina tried to defend its pegged rate by spending $1.1 billion in foreign reserves each month to buy excess pesos. By January 2014, the Argentine government was forced to devalue its currency ("Argentines Drain Reserves to Stash Dollars Under Mattresses" 2014). On January 23rd, the peso was devalued by 19%, and the government placed controls on the purchase of dollars. The same day, the peso's value fell by 10%. A week later, the Argentine government loosened exchange restrictions, and Argentines applied to buy $223 million dollars. Argentines own an undeclared estimated $160 billion of dollars abroad, or one in nine dollars in circulation abroad. As a result of the crisis and pesoification, few Argentines trust the exchange rate or banks. By March, the peso's value had fallen by 20%, but its value had stabilized ("Argentines Drain Reserves to Stash Dollars Under Mattresses" 2014).

Foreign reserves rose to $31.3 billion in January due to an inflow of Chinese funds, but the 2015 budget calls for the use of $11.9 billion to service its debt and defend the value of the currency ("Argentina's Foreign Reserves Grow Thanks to Influx of Chinese Funds" 2015). The Chinese funds are a part of a currency-swap financial assistance program that was signed in the summer of 2014. The agreement is renewable annually for three years at an interest rate of 6 or 7% (Parks 2014). As of January 2015, China had already provided Argentina with approximately $2.7 billion in yuan ("Argentina's Foreign Reserves Grow Thanks to Influx of Chinese Funds" 2015).

Faced with increasing inflation, Argentines' demand for dollars is still growing. The black market exchange rate was at 13.19 pesos per U.S. dollar at the in mid-February 2015 compared with an official exchange rate of approximate 8.75 pesos per dollar (Portes 2015). In the meantime, measures such as export levies on beef, a 35% tax rate on foreign credit card purchases, and a law to set price ranges and minimum production levels and limit profit

margins will not help Argentina's economy ("Argentina's Elections Could Boost Corn, Wheat Exports" 2015). After falling from 2005 to 2010, its public debt has begun rising again. It increased from $137 billion in 2010 to $203 billion in 2014, and the IMF expects GDP to fall in 2015 after contracting in 2014 (Bloomberg 2015).

Chapter 8: Data and Methodology

Comprehensive economic data on Argentina is limited. However, Argentina's gross public debt and GDP growth are available on a quarterly basis dating back to 2005, and various economic, demographic, and regional data on Argentina has been recorded over the same time period. In the previous year, 2004, Argentina completed the largest debt restructuring in history following its 2001-2002 default. As I have established, Argentina's economy had a long and volatile history with debt and default. However, the two factors only appeared to establish a negative correlation with one another following the implementation of Juan Peron's economic policies in the 1940s. After Peron's administration, Argentina spent decades in a vicious cycle of stagnant GDP growth and rising public debt. The visible results of the government's continuous spending beyond its means were high interest rates and rampant inflation.

The stated goal of Argentina's debt restructuring in 2004 was to sever this negative correlation between debt and growth. It was timed perfectly as domestic consumption rebounded following the crisis and the global boom in commodities prices began. Argentina certainly experienced a decade of high GDP growth between 2004 and 2014, but its growth began to slow in 2013 and 2014. Argentina's government never underwent the dramatic reforms that may have ended its heavy reliance on spending and debt. The goal of this thesis is to determine whether one of the largest debt restructurings in history successfully ended any negative correlation between Argentina's GDP and public debt.

Following the example of economists studying this relationship in other countries and regions, I employ OLS regressions between public debt and real GDP (by expenditure). This model is capable of determining whether any correlation exists between these two variables. In Schlarek's study, he used five models with different explanatory or independent variables

to examine the relationship between debt and GDP. Similarly, I created four models. These models use a total of ten independent variables in differing combinations. Public debt is the most important independent variable regressed on GDP. The other nine independent variables are economic, demographic, and regional variables chosen to best examine the economic situation in Argentina over the past decade. These variables are very comparable to those used in existing studies of GDP and public debt in groups of countries or regions. All data is taken on a quarterly or quarter over quarter basis with the exception of population growth, which is held constant for each year. Given the volatility of the global economy over the past decade, there are several outliers.

In order to account for the various contributors to GDP, a variety of economic statistics were utilized in the existing body of literature on this topic. Enrollment in secondary school and/or population growth were used as proxies for worker productivity by Kumar and Woo, Patillo et. al, Schlarek, and Checherita and Rother. I chose to use Argentina's population growth for this category because it was available over the time period that I studied. All of these models also incorporate trade indicators to expand beyond a closed economy model. These factors are meant to account for trade openness and global competitiveness. My model uses balance of payments as the major control variable in this category. I also tailored trade variables specifically to Argentina by including imports to the United States and Brazil (which account for between 20% and 30% of all Argentine exports) and the commodities price index, which greatly benefited Argentina's exports over the last decade.

Existing models use a variety of control factors to incorporate investment in the model. Since my model specifically examines investment in Argentina, I was able to use control factors that specifically correspond to domestic and international investment in

Argentina's economy over this time period. My model incorporates capacity utilization, producer prices, and industrial production as investment proxies. I also included consumer confidence in this category as a proxy for the GDP factors of consumption and investment.

Checcherita and Rother included fiscal indicators to consider tax revenue to the government, and my model included tax receipts as well as public debt the model to represent fiscal indicators of the Argentine economy and government expenditure. Unlike some similar studies, this model does not differentiate between different levels of debt. It seeks to see whether a correlation exists at every level, and all control factors are given the same weight.

Table 2: Summary Statistics

	Maximum Value	Minimum Value	Mean Value
GDP (by expenditure in billions of USD)	873.00	523.5	717.7
Public Debt (in billions of USD)	202.63	125.41	160.47
Population Growth (%)	1.07	0.87	1.02
Tax Receipts (in billions of USD)	105.00	8.5	40.18
Commodities Price Index	64.05	-33.36	8.51
Brazilian Imports (QOQ %)	11.27	-14.63	3.24
U.S. Imports (QOQ %)	20.5	-33.4	2.69
Consumer Confidence	58.28	37.78	49.59
Capacity Utilization (%)	82.03	67.23	76.16
Balance of Payments (in millions of USD)	213.7	40	964.51
Producer Prices (QOQ %)	28.22	4.02	13.98
Industrial Production (QOQ %)	10.84	-3.51	4.33

Sources: Bloomberg and the World Bank

Chapter 9: Empirical Results

The OLS linear regressions were performed to discover whether or not any negative correlation existed between public debt and GDP. In order to fulfill the assumptions of the OLS model, the data must be a random sample with variables independent from one another and normally distributed errors. A regression of the all of the variables included in the models on GDP growth yielded results that were inconsistent with these assumptions. Therefore, these models use GDP level as a reasonable proxy to quantify the correlation between the level of public debt and GDP in dollars. The first OLS regression used population growth, consumer confidence, capacity utilization, industrial production, Brazilian imports, and balance of payments as control variables. As visible in the below graph, the model fulfills the assumptions of OLS regressions.
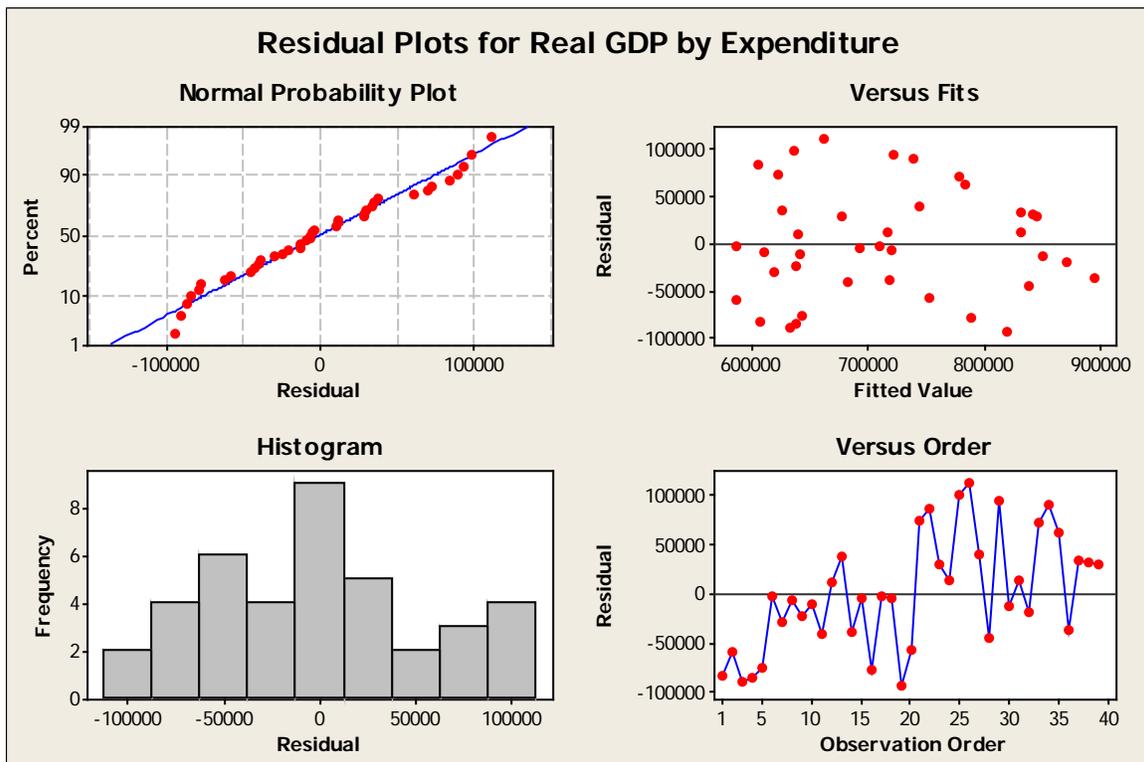
The regression results are as followed:

```
Predictor                  Coef  SE Coef       T      P    VIF
Constant               -115288   312131   -0.37  0.714
Public Debt             0.4863   0.5336    0.91  0.369  1.544
Population Growth       -192490   216748   -0.89  0.381  1.284
Brazil- Imports           2740     2357    1.16  0.254  1.311
Consumer Confidence      -1415     2198   -0.64  0.524  1.910
Capacity Utilization     15170     3773    4.02  0.000  1.395
BOP                      -44.34    29.39  -1.51  0.142  1.275
Industrial Production   -18505     3598   -5.14  0.000  2.783
```

The VIF or variance inflation factor quantifies the severity of multicollinearity or relationships between variables. It measures how much the variance of each regression coefficient is increased due to collinearity. Calculated as the reciprocal of tolerance ($1/(1-R^2)$), where R is an independent variable regressed on the remaining independent variables included in the model, values under ten are considered to fulfill the ordinary least square model's assumption of independence between variables. With a p-value of 0.369, public debt does not have a statistically significant relationship to GDP in this model. With an R-value of 65.0%, this model explains to 65% of the variance in Argentina's GDP between 2005 and 2014.

9.1 Six Factor Model

The second regression used six slightly different control factors as well as public debt:

balance of payments, population growth, capacity utilization, U.S. imports, tax receipts, and

industrial production. It also fulfills the assumptions of OLS regressions, as show below.
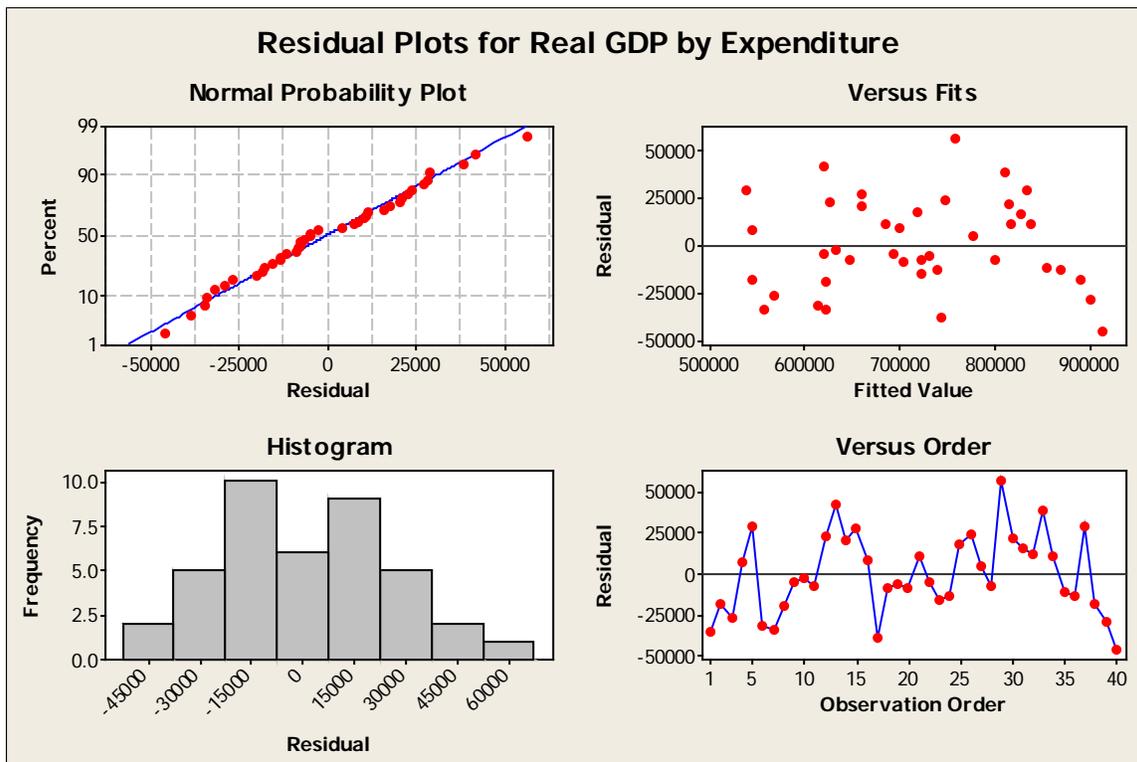
The R-value of this model was 94.1%, and once again, all measures of multicollinearity were

below ten. Unlike in the previous model, public debt had a statistically significant negative

correlation to GDP with a p-value of 0.00 and a coefficient of -1.1228.

The regression results are listed below.

```
Predictor                Coef   SE Coef      T      P     VIF

Constant               148257    130862   1.13  0.266
Public Debt            -1.1228    0.2535  -4.43  0.000   2.192
Population Growth       345294     94119   3.67  0.001   1.609
Capacity Utilization      4018      1745   2.30  0.028   1.748
BOP                     -14.59     11.69  -1.25  0.221   1.253
Industrial Production    -6263      1620  -3.87  0.001   3.430
Tax Receipts           3826.0     308.4  12.41  0.000   4.047
U.S. Imports           -797.0     536.0  -1.49  0.147   1.443
```

9.2 Best Fit Model

The third OLS regression used seven explanatory variables for GDP in addition to public debt: industrial production, population growth, tax receipts, capacity utilization, U.S. imports, balance of payments, and the commodities price index. It fits the OLS assumptions, and the results of the regression are as followed.

The regression results are below.

```
Predictor                   Coef   SE Coef      T      P     VIF
Constant                   89470    106320   0.84  0.407
Tax Receipts              3788.0     248.6  15.24  0.000   4.052
Public Debt              -0.9337    0.2090  -4.47  0.000   2.294
Industrial Production      -8091      1373  -5.89  0.000   3.798
Population Growth         455439     80078   5.69  0.000   1.794
Commodities Price Index    847.0     198.0   4.28  0.000   1.734
Capacity Utilization        2928      1429   2.05  0.049   1.806
BOP                      -12.792     9.424  -1.36  0.184   1.255
U.S. Imports              -705.4     432.3  -1.63  0.113   1.447
```

With a p-value of 0.00, public debt once again has a statistically significant negative correlation to GDP in this model with a coefficient of -0.9337. The entire model has a R-value of 97.0%, and once again, all variance inflation factors are below ten.

9.3 Ten Factor OLS Regression

The final regression used all of the independent variables from the previous models as well as some new ones: public debt, population growth, tax receipts, commodities price index, consumer confidence, Brazil imports, U.S. imports, capacity utilization, balance of payments, producer prices, and industrial production. Regressed on GDP, this model fulfills the assumptions of OLS regressions:

The regression results are below.

```
Predictor                     Coef   SE Coef       T      P    VIF
Constant                    162909    142757    1.14  0.264
Public Debt                -0.9069    0.2215   -4.09  0.000  2.330
Population Growth           408086    103266    3.95  0.001  2.553
Tax Receipts               3941.9     389.4    10.12  0.000  8.285
Commodities Price Index     859.1     274.7     3.13  0.004  3.178
Consumer Confidence        -570.6     820.7    -0.70  0.493  2.332
Brazil- Imports              -176      1047    -0.17  0.868  2.267
U.S. Imports               -559.0     543.4    -1.03  0.313  2.198
Capacity Utilization         2944      1569     1.88  0.071  2.112
BOP                        -16.27     10.32    -1.58  0.127  1.376
Producer Prices              -679      1784    -0.38  0.707  7.959
Industrial Production       -7286      1734    -4.20  0.000  5.657
```

With VIFs under ten, the variables in this model were not correlated to one another. The entire linear regression had a R-square value of 97.2%. This figure can be interpreted to mean that the independent factors accounted for 97.2% of the variance in GDP expenditure between 2005 and 2014. Population growth, tax receipts, the commodities price index, and industrial production all had statistically significant relationships with GDP.

With a correlation coefficient of -0.9069 and a p-value of 0.00, public debt also had a statistically significant, negative correlation with GDP. The fact that this correlation exists is markedly different from prior research. The majority of these negative correlations were negative but nonlinear, and they only appeared at certain debt thresholds. A few different researchers concluded that debt trajectory was more important, and several studies did not find evidence of a correlation at all.

In conclusion, Argentina's public debt and GDP have a statistically significant, negative correlation in three of these models. The other studies used debt levels and trajectory to study debt and GDP. Their general consensus was that a negative correlation between debt and GDP, and the direction of debt trajectory played an important part in determining long-term growth. Argentina's debt trajectory consistently fell over the time frame from around 35% of GDP to approximately 20% of GDP between 2005 and 2014, a level below the one

that most studies identified as dangerous to growth. Yet the negative correlation still existed. This finding indicates that Argentina may have a much lower debt tolerance than other countries.

Given Argentina's unique history, this conclusion seems to be a reasonable explanation of how public debt can restrain growth in a historically indebted or high-risk environment. Many countries, including several in Western Europe, have undergone periods of economic turmoil and default to become robust economies today. This change indicates that Argentina's economy can mature beyond stagnant growth and high debt. By gaining international markets' trust, Argentina may be able to begin this process. The first step would be to settle with its holdout bondholders from the crisis and exit selective default. Argentina owes its holdout bondholders approximately $23 billion. In the ten factor model, Argentina could increase its projected GDP level by $20,900 in 2015 or by 0.0000000241% of its 2014 GDP simply by settling, holding all other variables constant. While this is a small amount, it is important to note that the IMF currently projects that Argentina's GDP will shrink by -1.5% in 2015. This reduction in public debt could make a very large difference in terms of avoiding an economic recession in Argentina.

Chapter 10: Conclusion

As the first quarter of 2015 ends, Argentina is at a crossroads. In January 2015, a clause in the 2004 restructuring agreement expired. This clause prohibited Argentina from offering any group of bondholders a better deal than those who accepted the initial debt restructuring in 2004. If Argentina chooses, the country can now engage negotiate with holdout bondholders. A deal with these funds would allow Argentina to pay interest on its restructured bonds and exit selective default. However, according to lawyers who are working on the case, Argentina has not responded to calls for negotiation. Presidential elections are set for the fall of 2015, and President Kristina de Kirchner cannot run due to constitutional term limits. Her administration may simply plan to leave the challenge of a default to the next government.

In the meantime, the government's tight control over imports and foreign currency is creating shortages of goods. The IMF projects that annual inflation will reach 40% this year, and the GDP will contract by -1.3% after shrinking by -1.5% in 2014. Argentina claims that the economy grew by 0.5% in 2014, and it projects GDP growth of 2.8% in 2015.

Whether international observers believe the optimistic Argentine government or the IMF, Argentina is projected to rank second among countries on the misery index in 2015, which uses high unemployment and high inflation as its benchmarks. Interestingly, several other countries in the top 15 "most miserable" countries also have histories of default and restructuring. Serial offenders include Venezuela, Brazil, Colombia, and Turkey.

The statistically significant negative correlation between GDP and public debt in Argentina between 2005 and 2014 may have far-reaching consequences for these other countries. Existing research indicates that a falling debt trajectory is more important than debt-to-GDP ratios, and certain higher debt thresholds may have negative, non-linear

relationships with GDP growth. However, the negative, linear relationship between debt and GDP in Argentina implies that medium debt thresholds and falling debt can still be catastrophic for growth in countries with a history of default. It may be that default and restructuring are a lasting impediment to growth.

More research should be done to determine whether this negative correlation exists in other countries following defaults. Countries that have a history of high debt burdens need more information on this relationship in order to make decisions on debt and default and determine proper policies for growth. In the case of Argentina, it seems clear that public debt must fall farther in order to encourage sustainable GDP growth. In the immediate future, the Argentine government's best plan of action would be to compromise with international creditors in order to exit selective default and continue paying down its debt until it reaches a level where growth is unencumbered.

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Appendix A: Figures and Tables

Figure 1: Yield Spread between U.S. Bonds and Argentine Treasuries

Credit Squeeze

The premium over comparable U.S. Treasurys that Argentina would have to pay to borrow money*

18 percentage points
16
14
12
10
8
6
4
2
0

2008

*Based on J.P. Morgan's Emerging Market Bond Index
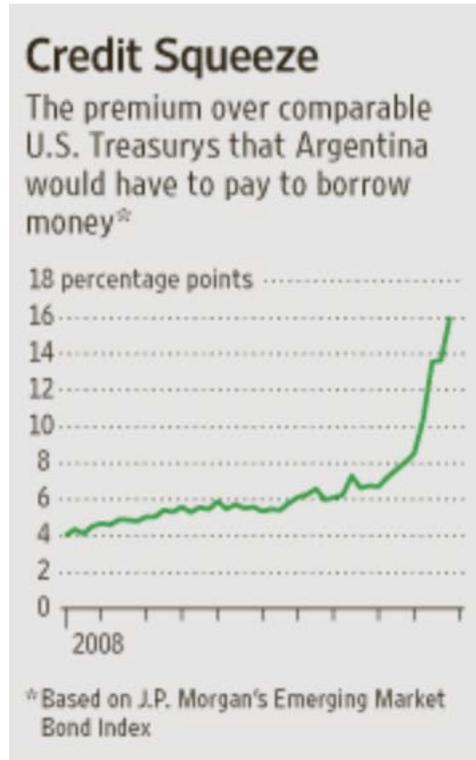
Source: J.P. Morgan EMBI

Figure 2: Debt and Growth in the Short Run

Real GDP growth per capita (percent)

Interquartile range
1 year

Debt-to-GDP thresholds (percent)
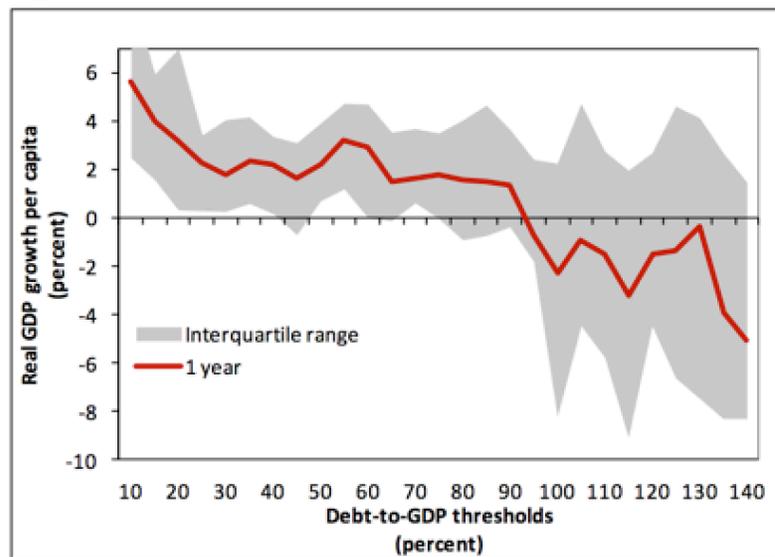
Source: Reinhart and Rogoff

Figure 3: Argentina's GDP Growth
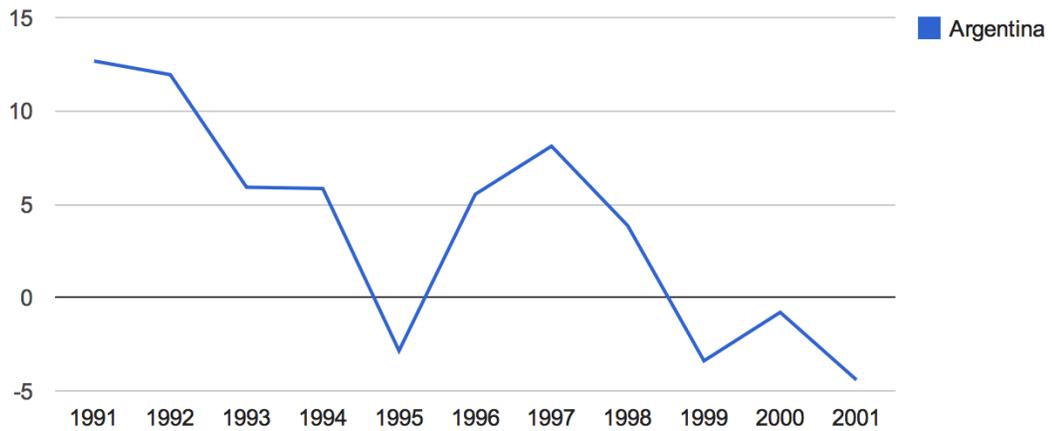
Source: IMF

Figure 4: Argentina's Public Sector Debt (1990-2002)
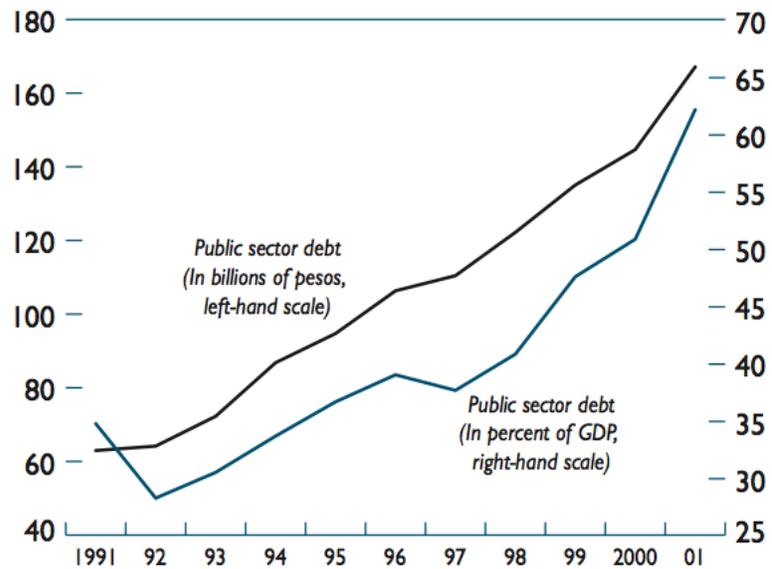
Source: IMF Database

Figure 5: Money Market Interest Rates for Argentina (1991-2002)
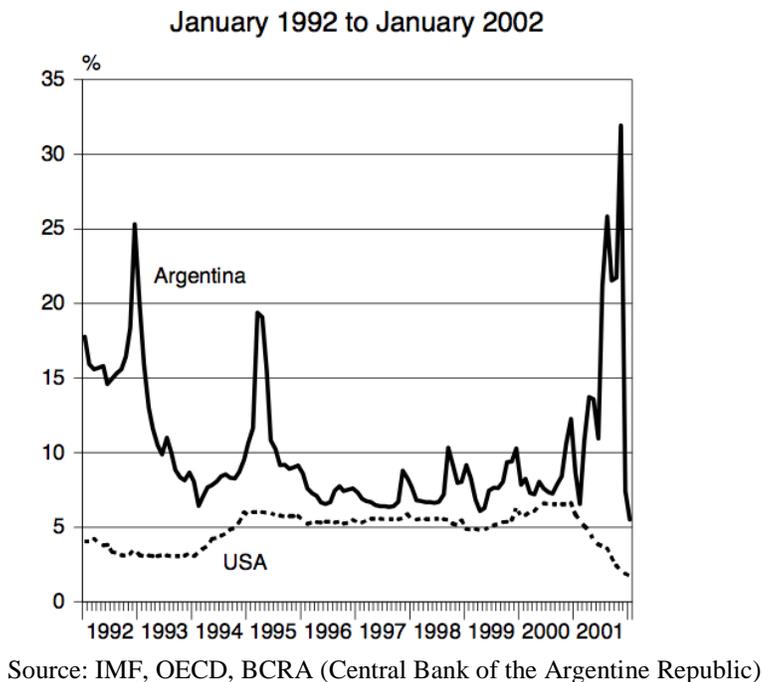
January 1992 to January 2002

Source: IMF, OECD, BCRA (Central Bank of the Argentine Republic)

Figure 6: Argentina's Foreign Currency Reserves (2000-2001)

Source: IMF database

Figure 7: Argentine Exports (1999-2011)

Exports (Billion $)
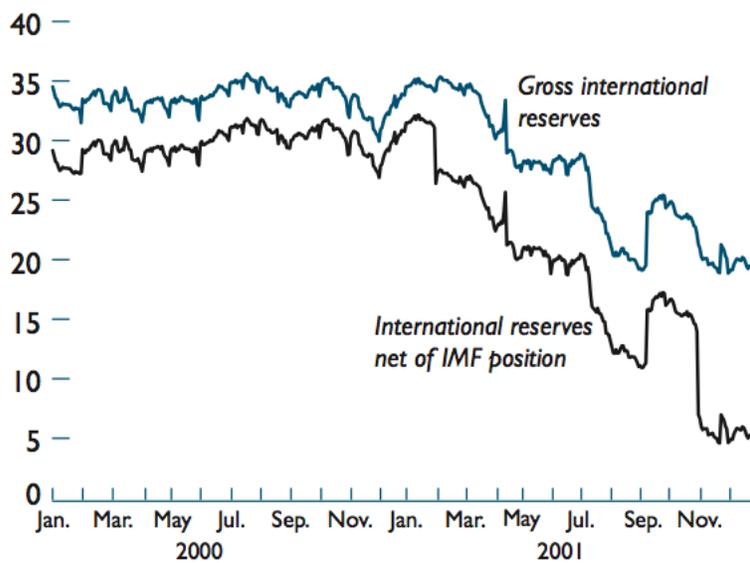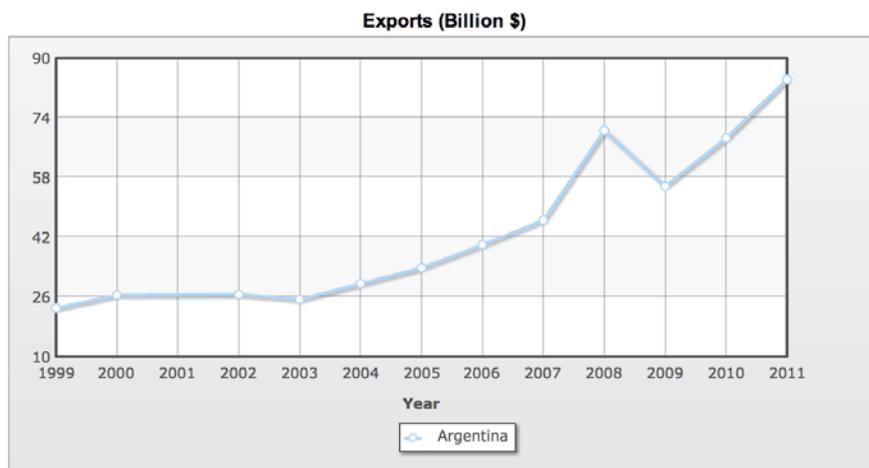
Country	1999	2000	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Argentina	23	26.5	26.7	25.3	29.57	33.78	40	46.6	70.59	55.67	68.5	84.27

Source: BCRA

Figure 8: 2015 Country Misery Index

The countries with the saddest projected rankings in the misery index for 2015
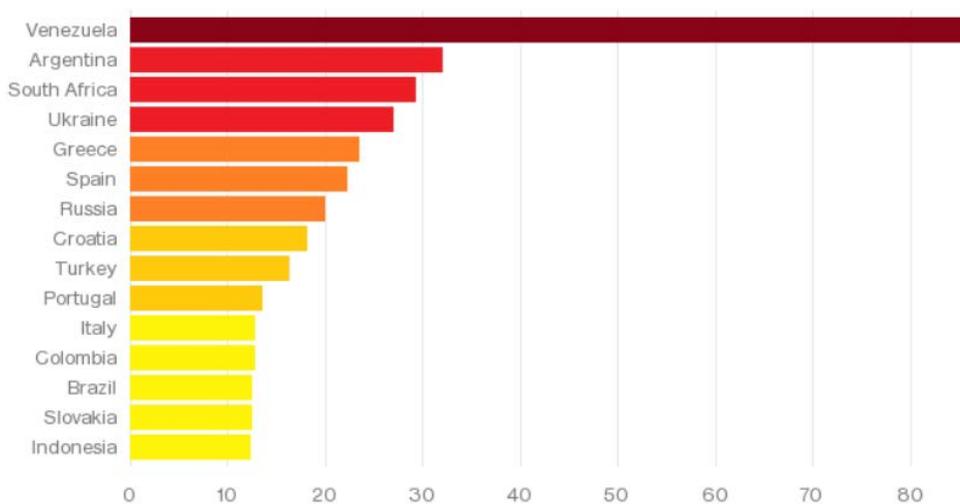
Source: Bloomberg News surveys.

Bloomberg

Source: Bloomberg News Surveys

Table 1: Argentina's Inflation

Year	Annual Inflation Rates per Argentine Government	Annual Inflation Rates per Private Consultants
2007	8.4%	24.9%
2008	7.2%	22.8%
2009	7.7%	15.5%
2010	10.9%	25.2%
2011	9.5%	22.6%
2012	10.8%	25.3%
2013	10.9%	28.3%

Table 2: Summary Statistics

	Maximum Value	Minimum Value	Mean Value
GDP (by expenditure in billions of USD)	873.00	523.5	717.7
Public Debt (in billions of USD)	202.63	125.41	160.47
Population Growth (%)	1.07	0.87	1.02
Tax Receipts (in billions of USD)	105.00	8.5	40.18
Commodities Price Index	64.05	-33.36	8.51
Brazilian Imports (QOQ %)	11.27	-14.63	3.24
U.S. Imports (QOQ %)	20.5	-33.4	2.69
Consumer Confidence	58.28	37.78	49.59
Capacity Utilization (%)	82.03	67.23	76.16
Balance of Payments (in millions of USD)	213.7	40	964.51
Producer Prices (QOQ %)	28.22	4.02	13.98
Industrial Production (QOQ %)	10.84	-3.51	4.33

Sources: Bloomberg and the World Bank

Appendix B: Empirical Results

Regression Analysis: Real GDP by versus Public Debt, Population G, ...

```
The regression equation is
Real GDP by Expenditure_1 = 162909 - 0.907 Public Debt
                          + 408086 Population Growth + 3942 Tax Receipts
                          + 859 Commodities Price Index
                          - 571 Consumer Confidence - 176 Brazil- Imports
                          - 559 U.S. Imports + 2944 Capacity Utilization
                          - 16.3 BOP - 679 Producer Prices
                          - 7286 Industrial Production


39 cases used, 1 cases contain missing values


Predictor                   Coef  SE Coef      T      P    VIF
Constant                  162909   142757   1.14  0.264
Public Debt              -0.9069   0.2215  -4.09  0.000  2.330
Population Growth          408086   103266   3.95  0.001  2.553
Tax Receipts              3941.9    389.4  10.12  0.000  8.285
Commodities Price Index    859.1    274.7   3.13  0.004  3.178
Consumer Confidence       -570.6    820.7  -0.70  0.493  2.332
Brazil- Imports             -176     1047  -0.17  0.868  2.267
U.S. Imports              -559.0    543.4  -1.03  0.313  2.198
Capacity Utilization        2944     1569   1.88  0.071  2.112
BOP                       -16.27    10.32  -1.58  0.127  1.376
Producer Prices             -679     1784  -0.38  0.707  7.959
Industrial Production      -7286     1734  -4.20  0.000  5.657


S = 21647.1   R-Sq = 97.2%   R-Sq(adj) = 96.0%


Analysis of Variance

Source          DF           SS          MS      F      P
Regression      11  4.32293E+11  39299363632  83.87  0.000
Residual Error  27  12652138934    468597738
Total           38  4.44945E+11


There are no replicates.
Minitab cannot do the lack of fit test based on pure error.


Source                  DF      Seq SS
Public Debt              1  88232181879
Population Growth        1   1451161527
Tax Receipts             1  3.15348E+11
Commodities Price Index  1    959507821
Consumer Confidence      1   5242670688
Brazil- Imports          1   4122949237
U.S. Imports             1   3835558509
Capacity Utilization     1     44622865
BOP                      1   1352250342
Producer Prices          1   3428852844
Industrial Production    1   8274758493


Unusual Observations
```

```
      Public     Real GDP by
Obs    Debt   Expenditure_1     Fit   SE Fit  Residual  St Resid
 16  144729          710039  676082   18240     33956     2.91R
 29  173147          816120  757159    6967     58961     2.88R
```

R denotes an observation with a large standardized residual.
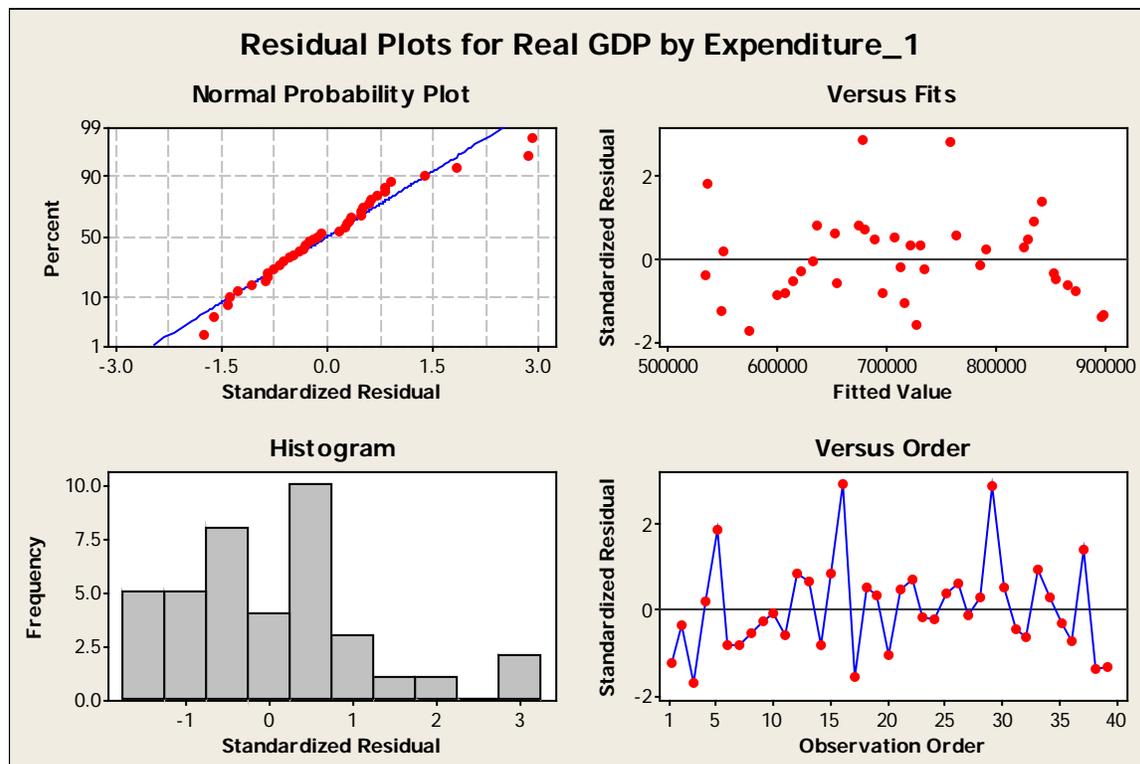
Residual Plots for Real GDP by Expenditure_1

Regression Analysis: Real GDP by versus Public Debt, Population G, ...

```
The regression equation is
Real GDP by Expenditure = - 115288 + 0.486 Public Debt
                          - 192490 Population Growth + 2740 Brazil- Imports
                          - 1415 Consumer Confidence
                          + 15170 Capacity Utilization - 44.3 BOP
                          - 18505 Industrial Production


39 cases used, 1 cases contain missing values


Predictor                Coef   SE Coef       T      P    VIF
Constant              -115288    312131   -0.37  0.714
Public Debt            0.4863    0.5336    0.91  0.369  1.544
Population Growth     -192490    216748   -0.89  0.381  1.284
Brazil- Imports          2740      2357    1.16  0.254  1.311
Consumer Confidence     -1415      2198   -0.64  0.524  1.910
Capacity Utilization    15170      3773    4.02  0.000  1.395
BOP                    -44.34     29.39   -1.51  0.142  1.275
Industrial Production  -18505      3598   -5.14  0.000  2.783


S = 64055.6   R-Sq = 71.4%   R-Sq(adj) = 65.0%

PRESS = 211364713871   R-Sq(pred) = 52.50%
```

```
Analysis of Variance

Source           DF          SS           MS      F      P
Regression        7  3.17749E+11  45392656837  11.06  0.000
Residual Error   31  1.27197E+11   4103114227
Total            38  4.44945E+11


Source                  DF      Seq SS
Public Debt              1  88232181879
Population Growth        1   1451161527
Brazil- Imports         1   9190046045
Consumer Confidence      1  63373239181
Capacity Utilization     1  32045687309
BOP                      1  14935340079
Industrial Production    1  1.08521E+11
```
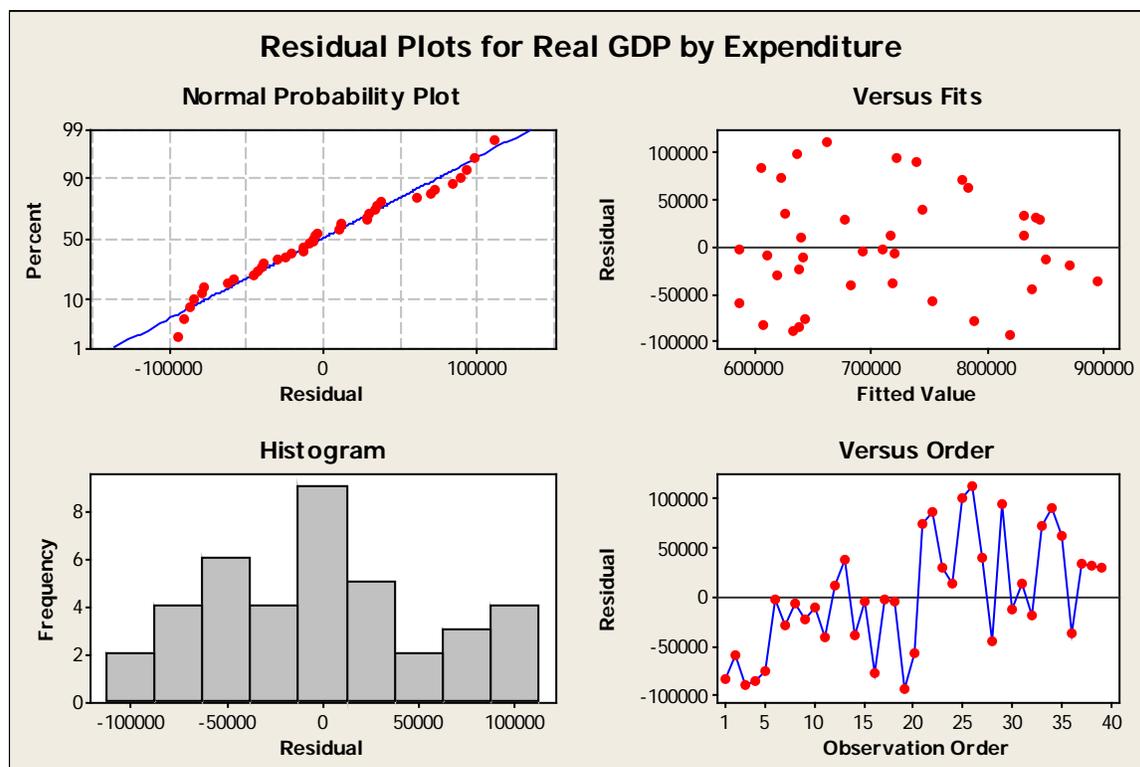

Residual Plots for Real GDP by Expenditure

Regression Analysis: Real GDP by versus Public Debt, Population G, ...

```
The regression equation is
Real GDP by Expenditure = 148257 - 1.12 Public Debt + 345294 Population Growth
                          + 4018 Capacity Utilization - 14.6 BOP
                          - 6263 Industrial Production + 3826 Tax Receipts
                          - 797 U.S. Imports


Predictor               Coef  SE Coef       T      P    VIF
Constant              148257   130862    1.13  0.266
Public Debt          -1.1228   0.2535   -4.43  0.000  2.192
Population Growth      345294    94119    3.67  0.001  1.609
Capacity Utilization     4018     1745    2.30  0.028  1.748
BOP                   -14.59    11.69   -1.25  0.221  1.253
```

```
Industrial Production    -6263     1620   -3.87   0.001   3.430
Tax Receipts             3826.0    308.4  12.41   0.000   4.047
U.S. Imports             -797.0    536.0  -1.49   0.147   1.443


S = 26569.6   R-Sq = 95.2%   R-Sq(adj) = 94.1%

PRESS = 37739446272   R-Sq(pred) = 91.94%


Analysis of Variance

Source          DF          SS          MS      F      P
Regression       7  4.45677E+11  63668087544  90.19  0.000
Residual Error  32  22590251107    705945347
Total           39  4.68267E+11


Source                 DF      Seq SS
Public Debt             1  1.07317E+11
Population Growth       1   3162154100
Capacity Utilization    1  17379821891
BOP                     1   2707232638
Industrial Production   1  2.02429E+11
Tax Receipts            1  1.11120E+11
U.S. Imports            1   1560934816


Unusual Observations

      Public   Real GDP by
Obs     Debt   Expenditure      Fit   SE Fit  Residual  St Resid
 17   144493        705408   743705    19634    -38297     -2.14R
 29   173147        816120   759414     6282     56706      2.20R

R denotes an observation with a large standardized residual.
```
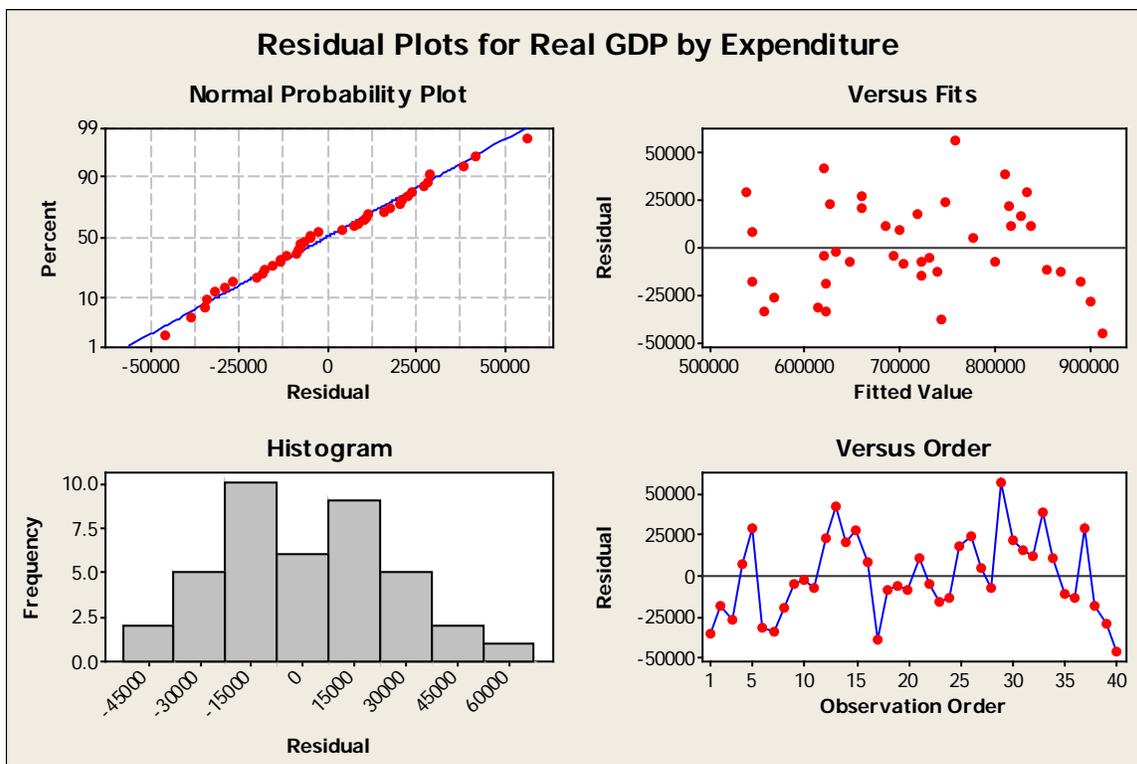
Residual Plots for Real GDP by Expenditure

Regression Analysis: Real GDP by versus Tax Receipts, Public Debt, ...

```
The regression equation is
Real GDP by Expenditure = 89470 + 3788 Tax Receipts - 0.934 Public Debt
                          - 8091 Industrial Production
                          + 455439 Population Growth
                          + 847 Commodities Price Index
                          + 2928 Capacity Utilization - 12.8 BOP
                          - 705 U.S. Imports
```

Predictor	Coef	SE Coef	T	P	VIF
Constant	89470	106320	0.84	0.407	
Tax Receipts	3788.0	248.6	15.24	0.000	4.052
Public Debt	-0.9337	0.2090	-4.47	0.000	2.294
Industrial Production	-8091	1373	-5.89	0.000	3.798
Population Growth	455439	80078	5.69	0.000	1.794
Commodities Price Index	847.0	198.0	4.28	0.000	1.734
Capacity Utilization	2928	1429	2.05	0.049	1.806
BOP	-12.792	9.424	-1.36	0.184	1.255
U.S. Imports	-705.4	432.3	-1.63	0.113	1.447

```
S = 21405.6   R-Sq = 97.0%   R-Sq(adj) = 96.2%

PRESS = 27568079301   R-Sq(pred) = 94.11%


Analysis of Variance
```

```
Source          DF          SS          MS        F      P
Regression       8  4.54063E+11  56757831901  123.87  0.000
Residual Error  31  14204208708    458200281
Total           39  4.68267E+11
```

```
Source                    DF      Seq SS
Tax Receipts               1  3.89954E+11
Public Debt                1  15553316206
Industrial Production      1  16436491635
Population Growth          1  17306409839
Commodities Price Index    1  10868077867
Capacity Utilization       1   1914171098
BOP                        1    810763757
U.S. Imports               1   1219754535
```

Unusual Observations

```
          Tax  Real GDP by
Obs  Receipts  Expenditure     Fit   SE Fit  Residual  St Resid
 16        23       710039  667175    14607     42863     2.74R
 29        49       816120  758006     5072     58114     2.79R
```

R denotes an observation with a large standardized residual.

Residual Plots for Real GDP by Expenditure
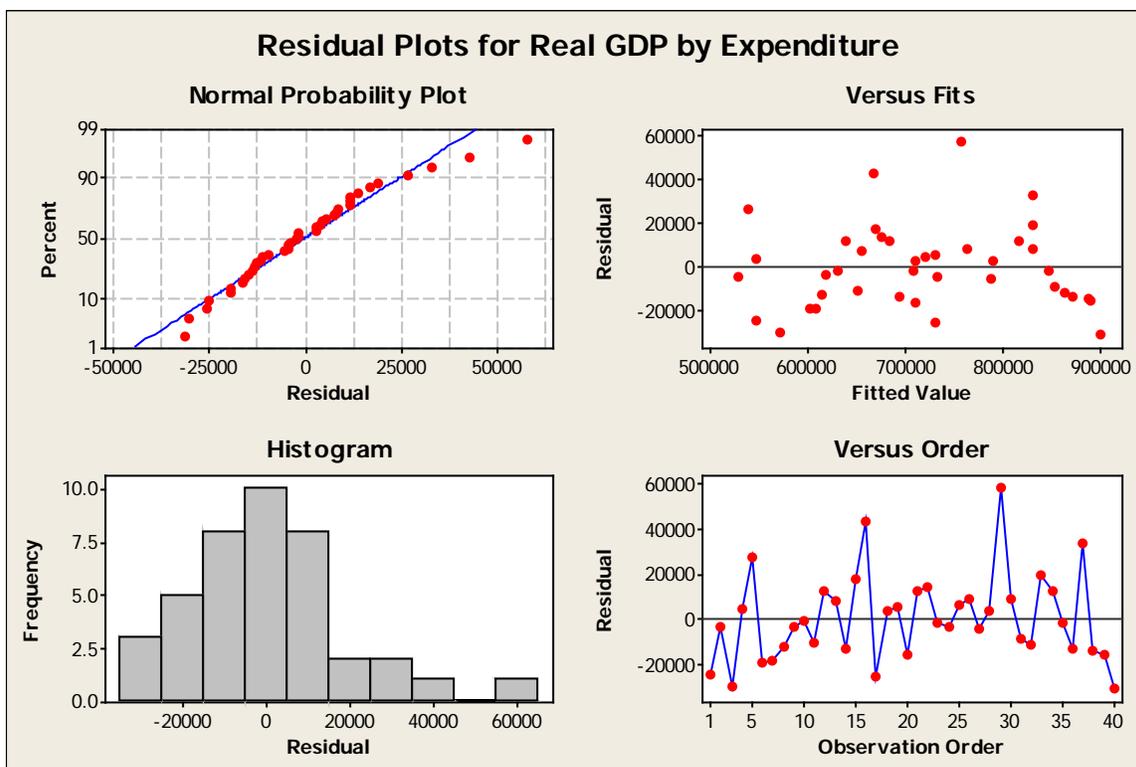
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EDUCATION

The Pennsylvania State University, Schreyer Honors College
University Park, PA
The Smeal College of Business, Bachelor of Science, Finance   *Expected Graduation: May 2015*
Minors: International Business, Economics, and Spanish

IES Abroad   **Buenos Aires, Argentina**
Spanish language and Latin American business   *Fall 2012*

Pforzheim Hochschule   **Pforzheim, Germany**
European Integration and Economics   *Summer 2011*

RELATED WORK EXPERIENCE

The Securities & Exchange Commission, Division of Enforcement   **Chicago, Illinois**
Honors Finance Intern   *May 2014-August 2014*

- Participated in the investigation of municipal TIF bond fraud and the first ever temporary restraining order to be filed against a municipal government as well as the investigation of the city comptroller involved
- Helped to complete the bank record analysis of suspected fraudulent enterprises and Ponzi schemes for restitution
- Assisted in the investigation of an auditing firm to determine whether or not their policies upheld professional and legal standards

Janssen Research & Development, Inc.   **Raritan, New Jersey**
Accounting and Finance Co-op   *June 2013- January 2014*

- Analyzed and recorded sales of a diagnostic test and related equipment, including monthly and quarterly journal entries and balance sheet reconciliations for corporate headquarters
- Invoiced clients in the United States and Puerto Rico using SAP to invoice, track, and reconcile sales to the general ledger, and create the resulting sales tie-outs, DSO reports, and quarterly balance sheet reconciliations
- Forecasted for a $3 million capital oncology research and pharmaceutical development budget with partners in the United States and Beerse, Belgium, and reported the budget actuals, targets, and estimates

W3 Americas   **Buenos Aires, Argentina**
U.S. Business Accounts Intern   *August 2012 –December 2012*

- Wrote, edited, and consulted on financial and marketing performance reports as well as website content
- Researched a variety of international businesses for brand development

Exela Ventures, LLC.   **Antigua, Guatemala**
Marketing Intern   *June 2012 – August 2012*

- Initiated and developed business relationships with other organizations to form partnerships for future collaborations on volunteer work, tour activities, and business sponsorships in the United States
- Organized service projects and recreational activities with local Guatemalan business, non-profits, orphanages, and other organizations for tour participants

LEADERSHIP & ACTIVITIES

Smeal LeaderSHIP   **University Park, PA**
Mentor   *Fall 2011-Spring 2012*

- Donated time to mentor high school students on the college application process and the transition from high school to college

Global Business Brigade   **University Park, PA**
Fundraising Chair   *September 2011-Spring 2012*

- Traveled to Panama over spring vacation to instruct a poverty-stricken community on sustainable business models and basic business practices, including marketing and accounting
- Facilitated and organized fundraisers for the club independently and with local businesses