

# **ARGENTINA AGRICULTURE: THE DEVELOPING CRISIS**

BY

Michael Horrell

2014

Submitted to the graduate degree program in Global and International Studies and the Graduate Faculty of the University of Kansas in partial fulfillment of the requirements for the degree of Master of Arts.

---

Chairperson: Dr. John Kennedy

---

Dr. Michael Wuthrich

---

Dr. Rebecca Birch

Date Defended: 2 December 2014

The Thesis Committee for Carl (Michael) Horrell certifies that this is the approved version of the following thesis:

# **ARGENTINA AGRICULTURE: THE DEVELOPING CRISIS**

---

Chairperson: Dr. John Kennedy

Date Approved: 2 December 2014

## **ABSTRACT**

The government of Argentina has put in place extractive political and institutional processes that have been ripe for rent seeking activity and that have supported the interests of urban elites, voters, and populist politicians to the detriment of rural and export-oriented agricultural interests. However, it is unclear how these policies influence growth in agricultural markets.

The global population is projected to grow to nine billion by 2050 and will severely test our abilities if we do not understand how to put in place the most efficient and productive political-economic systems to promote the most efficient production of food, fiber, and fuel. Nature has blessed few countries in the world as it has Argentina with fertile land and climate and few have been governed as badly as the populist Argentine governments have over the past 70 years as it has systematically plundered the Pampas and its exports to placate their urban constituencies and prop up their failing economic policies.

I will examine Argentine agriculture with an analysis of long-run historical data and comparing the data for crop production systems (Corn, Soy, and Wheat) against data that demonstrates aggressive and extractive trade policies. Isolating for these extractive taxation policies and programs should provide opportunities for comparison and allow better understanding of the effects that rules and governance have had on agricultural production in Argentina.

The data suggest that Argentine agricultural output, much of which is exported, has been negatively impacted by the trade and tax policies pursued by the Argentina governments since 2003. Since export profitability is hampered (and potentially eliminated) by high import taxes, export taxes, and an overvalued exchange rate, the farmers / producers have made decisions on crop production. Producer investment in efficient production methods has been lower than it could have been. In addition, there has been a dramatic change in the mix of crops produced that could lead to future food shortages in the urban centers.

## **TABLE OF CONTENTS**

ABSTRACT.....	iii
TABLE OF CONTENTS.....	iv
LIST OF FIGURES .....	v
CHAPTER I – INTRODUCTION.....	1
CHAPTER 2 – LITERATURE REVIEW .....	18
CHAPTER 3 - METHODOLOGY .....	33
CHAPTER 4 - RESULTS & ANALYSIS.....	40
CHAPTER 5 – DISCUSSION AND CONCLUSIONS .....	57

## **LIST OF FIGURES**

Figure 1 – Currency Reserves & Balance of Payments - Argentina.....	2
Figure 2 - Map of South America & Argentina.....	4
Figure 3 - Map of Pampas Region, Argentina .....	5
Figure 4 - Exchange Rate Changes .....	12
Figure 5 - Gross Domestic Product & Agriculture Contribution, 1990-2010 .....	14
Figure 6 - Argentina Export Tax Rates, 1965-2011 .....	27
Figure 7 - Agriculture Contribution to GDP / Soy vs. Food Production, 1980-2013.....	34
Figure 8 - Data Sets and Definitions.....	36
Figure 9 - Key Economic Indicators, Argentina, 1975-2012.....	40
Figure 10 - Comparison: Southern Cone Per Capita GDP .....	41
Figure 11 – Total Crop Value of Production, Argentina, 2000-2013 .....	42
Figure 12 – Corn & Wheat Production per Capita, Argentina, 2000-2013 .....	43
Figure 13 – International Wheat Prices, 2000-2013 .....	44
Figure 14 – Wheat Production Levels, 2000-2013 .....	45
Figure 15 - Crop Production Index, MERCUSUR, 2004-2006.....	46
Figure 16 - Changing Commodity Production, 1980-2013 .....	48
Figure 17 - Commodity Production, Brazil/Paraguay/Canada/US, 1980-2013.....	50
Table 18 - Argentina’s production and exports of selected ag commodities, avg. 2005-2011....	52
Figure 19 - Argentina Agricultural Production Changes, 1990-2013 .....	53
Figure 20 - Argentina Per Capita Food Production, Argentina, 2000-2012 .....	54
Figure 21 – Export Tax Correlation to Food Production & Investment .....	56

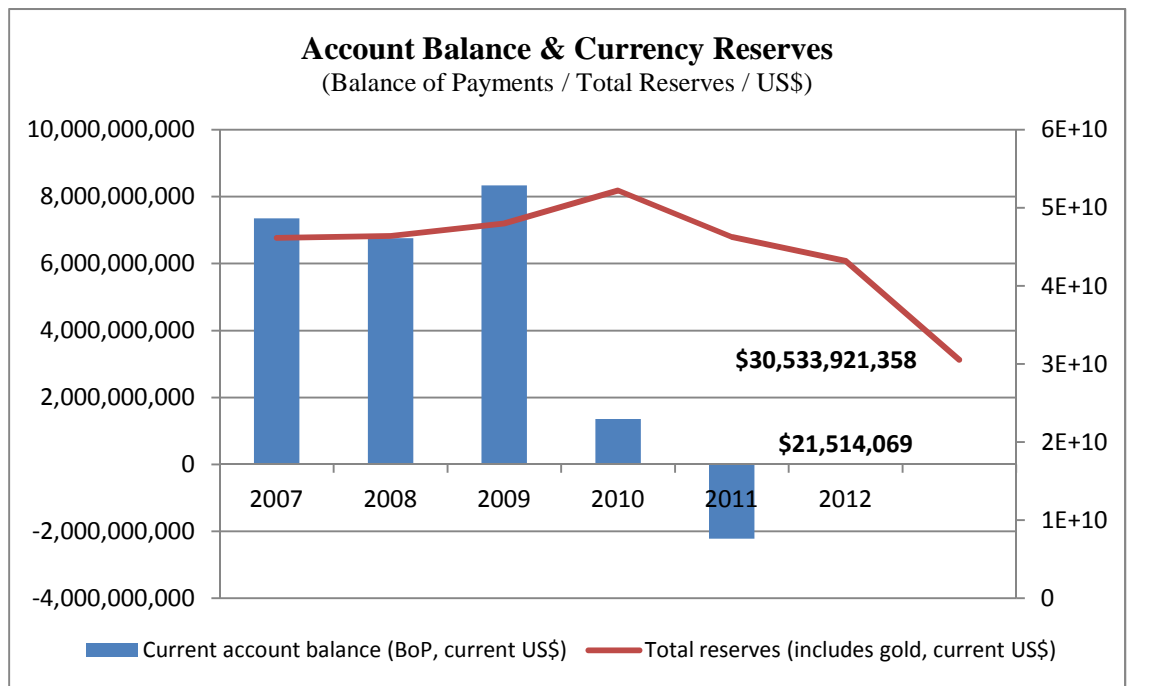
## **CHAPTER I – INTRODUCTION**

The aggregate data for agricultural production in Argentina since the first Kirchner Administration came into office in 2003 is impressive. Total Agricultural Production (TAP) has continued to rise and has helped fuel the growth in the Argentine Gross Domestic Product (GDP). Agricultural production has more than doubled from \$15 billion in 2003 to \$36 billion in 2013. The agricultural share of the Argentine GDP has gone from 8.4% to 9.4% during the same period. This growth corresponds to a time when the government of Argentina was implementing policies that should not be favorable to economic growth, overall economic or agricultural. What can explain this contradiction for our expectations of free market economics? We understand that farmer behavior is shaped by agricultural policies as well as other factors such as technological innovations and international commodity prices. Are the impacts from domestic agricultural policies hidden in the data? Are the farmers in Argentina reacting more to national policies than to global market forces as they plan production or vice versa? Is it possible that these production decisions are having a negative impact on the production of food in Argentina?

The decision in 2012 by President Cristina Kirchner's government to re-nationalize YPF (Yacimientos Petrolíferos Fiscales), the Argentinean oil company controlled by Spanish company Repsol, took many by surprise. However, it should not have surprised anyone. The Argentine economy has experienced a number of adverse developments over the past three decades, from the historic sovereign default in 2001, to very high inflation, to civil unrest caused by shortages of basic necessities. The developments have led to a dramatic weakening of the productive and economic vibrancy within the country, significantly impacting its economic potential, and causing substantial degradation of the agricultural industry. As shown

in the chart below, the international reserves held by Argentina have steadily eroded. Trying to slow this currency flight, the Argentine government has recently imposed even more stringent controls on the movement of capital and has gained firm control of the Argentine Central Bank.

Figure 1 – Currency Reserves & Balance of Payments - Argentina



(Calculated from World Bank Data, 2014)

Argentina at the beginning of the 20th century had the ninth largest economy in the world. Their agricultural production rivaled that of the United States. However, Argentina has also been a case study of how extractive political and economic systems affect the development of economies. Political institutions that are “extractive” are the opposite of the well-functioning, pluralistic institutions in democratic societies where “inclusive” institutions are the norm. There is a natural and powerful synergy between economic and political institutions (Acemoglu & Robinson, 2012, p. 480). Nations that have developed extractive political processes tend to concentrate power and influence into the hands of narrow elites. The populist governments in Argentina are a prime example of this phenomenon. The economic institutions are in turn structured and influenced to the benefit of these elites and then the institutions

become economically extractive as well. Extractive economic institutions are those that extract the incomes and wealth from one subset of society to benefit a different subset. The extractive economic institutions will, in turn, enrich the same elites who control the political processes, thus allowing them to further consolidate political dominance (Michels, 1962).

What are these “institutions” that have been so extractive in Argentina? The definition for institutions in this context is broad. One can think of institutions as a system of rules, beliefs, and organizations. Grief coined the broad definition as “a system of institutional elements that conjointly generate a regularity of behavior by enabling, guiding, and motivating it” (Grief, 1993). The rules within an institutional framework coordinate behavior and enable people to act efficiently. The belief in this institutional framework is also important. Even in formal structures, people have to be motivated to follow the rules. This is even more important in informal structures. Informal institutions are sustainable only if people believe that their actions will result in a reward or punishment (Grief, 1993). The political framework in Argentina has allowed the political elite to extract value from the agricultural sector to the benefit of their own political interests, for example, preventing civil unrest due to rising food costs. One example of how this extraction is carried out has been the imposition of quantitative export restrictions. As international commodity prices increased in the mid-2000s due to increased demand from China and India, the Argentine government became concerned that agricultural producers would raise prices in line with the international prices and that would cause food prices to rise. The government implemented a series of export restrictions and price controls that focused on the commodities most closely associated with food and were intended to maintain a reasonable price and domestic supply for these products. Because these policies have also impacted production decisions, they have not succeeded and have actually led to



lower availability of the very products they were intended to make more abundant (Nogués, 2011).

For comparative discussion, inclusive institutions are the opposite of this situation. When countries have inclusive political and economic institutions, everyone gets a chance to participate in the political process, everyone has the opportunity to start a new business, and everyone has the chance to save and invest (Acemoglu & Robinson, 2012, p. 70). According to Acemoglu and Robinson, much of the early economic growth experienced by Argentina in the past century was driven by extractive political and economic institutions and involved little creative destruction or innovation. Much like the Soviet Union in the 1950s and China in the 2000s, these types of economic systems can experience rapid growth, but this growth is not sustainable for the long term (Acemoglu & Robinson, 2012, p. 47).

Figure 2 - Map of South America & Argentina



(University of Texas, 2014)

Nature has blessed few countries in the world with the bounty of fertile land and accommodating climate as it has in Argentina. Argentina's share of the world's arable land is only 2.23% but Argentina produced 8.4% of world agricultural output from 2005-2007.<sup>1</sup> Most of this hyper-productive farmland is concentrated in the Pampas region. Covering the central provinces of Santa Fe, Córdoba, Buenos Aires, Entre Ríos, and La Pampa, the Pampas is an ecoregion that is ideally suited for farming. Over 80% of the soybean, corn, and wheat production in Argentina takes place in this Pampas region. (Leguizamón, 2013) See Map below.

Figure 3 - Map of Pampas Region, Argentina



Map of Argentina, Pampas Ecoregion and area of GM soy production. (University of Texas, 2014)

However, because the Argentine government has governed with such extractive institutions over the past century, the Argentine agricultural industry has experienced decades of

<sup>1</sup> (Calculated from data at Food and Agriculture Organization of the United Nations, 2013).

sustained manipulation through policies enacted to extract economic rents from the agricultural producers. The Argentine economy overall has continued to decline since 2003 due to the role successive Populist Kirchner governments have played in attempting to control market forces through the imposition of populist tax and regulatory policies. (Fairfield, 2011)

A fundamental economic premise of the Chicago neoclassical school of economic thought is that free market economics and the inclusive institutions to support it have the ability to improve the economic well-being of all those people fortunate enough to participate in them. This approach is the neoliberal theory. It is the middle ground between the more laissez-faire doctrine of classical liberalism and the doctrine of collectivist central planning. Neoliberalism promotes the advantages of a market economy that operates with the guidance and rules established by a strong state actor. In this construct, in order to be successful, free market activities require good rules and governance. When rules and governance are more transparent and efficient, it becomes easier for individuals and entrepreneurs to improve their own economic well-being. While there are no purely good rules or completely transparent governance, with “better” rules and governance, individuals and firms can accomplish improved economic conditions within the rule of law and be assured that what they create and earn will be theirs to keep. Although no nation has absolutely transparent institutions, it is the spectrum of institutional governance we should be most interested in.

Good political governance requires the widest distribution of political power along with limits to those in power. When nations establish rules and governance that are less transparent, when individual property is not secure, and when regulation, governance, and taxation are burdensome, accomplishment in any endeavor (business, agriculture, or otherwise) becomes more about the ability to seek advantage through institutional rent-seeking than about being

efficient and innovative (Ground R. L., 2011). Success becomes dependent more on whom you know than on what you can do. In technical terms, this economic rent is the difference between what a group is paid and what they should have been paid for their labor, capital, or land to remain in their current use. Examples of rent-seeking activities are forming cartels and lobbying for rules that benefit one group at the expense of competitors or customers. While this happens to some degree in every country, it seems to be at a higher level of occurrence in Argentina. The populist-oriented Argentine governments have systematically plundered the agricultural industry in order to placate urban elites, voters, and politicians (Richardson, 2008, p. 239). Good economic governance provides solid property rights, contract enforcement, competitive markets, and the freedom for individuals to choose their economic endeavors (Helpman E. , 2004, p. 112) (Prasad, 2003, p. 753). An interesting and key conceptual perspective on the history of political governance in Argentina is that the same extractive economic policies have been in place despite regime change over time. The notable period of exception to this was the 1990s.

Argentina's governments have sacrificed good governance for political gain and electoral politics and have implemented policies that seem designed to concentrate political powers. The political elites have failed to adhere to basic principles of providing good economic governance (Gallo, 2012). This does not mean necessarily that there was some clever malfeasance on the part of the political elite. It is also a function of the development of democratic processes in Argentina. Elected leaders often act in rational manner to retain voter loyalty and maintain their position of power, even when the consequence of these actions may be detrimental. The extractive political and institutional processes of democracy in Argentina have also been ripe for economic rent seeking activity (Ground, 2012). Rent seeking has led to

burdensome regulation and prohibitive trade barriers that have limited competition and kept the nation's resources from being put to their best use. This has been especially true in agriculture where producers have had to contend with the natural risks as well as the market risks to earn their livelihoods. The definition of agricultural producers includes the range of people and organizations engaged in farming to create economic value.

The issue of efficient food production also has impacts and influence beyond Argentina's borders. The global population is projected to grow to nine billion by 2050 and will severely test our ability to feed and clothe them if we do not understand how to put in place the most efficient and productive agricultural systems to promote the most efficient production of food, fiber, and fuel. Argentina needs to be part of the global solution to this growing need. The current trends in the regulation and taxation of Argentina agriculture seem likely to trigger a decline in farm output (The Economist, 30 Sep 2013).

Some political leaders in Argentina have attempted to reverse this course and develop more liberalized market mechanisms. In 1991, Argentina began a series of reforms and privatizations that showed some promise of stabilizing the economy. Economic activity was deregulated, companies owned by the government were privatized, and the state pulled back from its interventions in most economic activity (Gallo, 2012). The government also pegged the Argentine Peso to the US dollar with the "Convertibility Plan" (Quispe-Agnoli & Kay, 2013). These changes eased much of the instability that had plagued the economy in the post-Peron years. These changes toward better economic governance came at a social price. The problem was that pegging the Peso to the US dollar created a crisis situation of its own with an over-valued currency (The Economist, 1999). This led to increased borrowing and spending on imports. Without a floating exchange rate, the only way Argentina's products could remain

competitive was to reduce the domestic price. This option of course was limited to the point where the cost to produce is equal to the price. Production slowed, unemployment rose, and poverty grew. Massive borrowing by the government in order to ease the issues related to the fixed exchange rate in turn made the Argentinean economy susceptible to external shocks. This shock came in the form of reduced commodities prices beginning in 1998. (The Economist, 1999)

Even as this recession deepened in 2001 and 2002, the politicians in Buenos Aires could not devalue the currency due to the strict Convertibility Plan. They were in effect stuck with an overvalued exchange rate, severely hampering agricultural exports (Gallo, 2012, p. 55). Exploding government debt, coupled with the inability to reduce governmental bureaucracy and spending, led to a flight of capital and chronic budget deficits. The failure of the political leadership to provide a solid governance and regulatory environment subsequently led to the largest sovereign debt default in modern history. The government abrogated its responsibility to creditors to repay more than \$93 Billion (USD) in external debts. Argentina issued its first moratorium on debt repayment as far back as 1891. They have done so several times in the interim and most recently in July 2014. Potential creditors recognized this as a risk. Working with the International Monetary Fund (IMF), these creditors insisted that Argentina agree that any litigation resulting from loans be subject to US (New York) law. Of course, in the intervening years the Kirchner government has fought this interpretation as well.

In the default of 2001, and in keeping with the political need to resist taking the blame for trouble, the government in Argentina needed to find a scapegoat. Barbieri points out that rather than view this default as the result of their own failures, the populist politicians in Buenos Aires applauded the default and blamed external factors for the trouble, including greedy

creditors and the International Monetary Fund (IMF) (Barbieri, 2012). An interesting note to the crisis in 2001 was that there was no military intervention as there had been in past episodes. The default put an end to the period of structural reform and left the Argentine population permanently suspicious of liberal market reform (Leaders, 2014). It also gave rise to a regime in which populist government programs were resurgent. Successive Kirchner governments first elected in 2003 have instituted economic policies that have led to high growth rates but have also led to even higher inflation rates (Richardson, 2008, p. 239). The policies pursued by the Kirchner administrations were extractive taxes that directly appropriated income produced by agricultural exports for use by the government to fund populist programs (Richardson, 2008, p. 231). For example, the Kirchner government provided funds to subsidize resources and services important to urban areas, particularly energy (electricity, petroleum, and natural gas) and public transportation. The government also used the revenue from the agricultural taxes to pay for increased public sector salaries and pensions.

In another example of how populist programs have distorted the market, the Argentine government has had to subsidize the continued production of bread for domestic consumption. Directly due to the government-imposed price controls and export restrictions on wheat, wheat producers and mills lack the market incentives to continue production. In order to maintain domestic prices and supply, the government issues subsidies directed to producers to compensate them for the difference between international prices and the lower, government imposed domestic prices (Richardson, 2008). According to Richardson, both wheat farmers and flour mills have received these subsidies. Farmers selling to the mills for the domestic market receive the official price from the mills and then have to submit paperwork to the government to receive the subsidy. The mills do the same when they sell their flour. The purpose of this

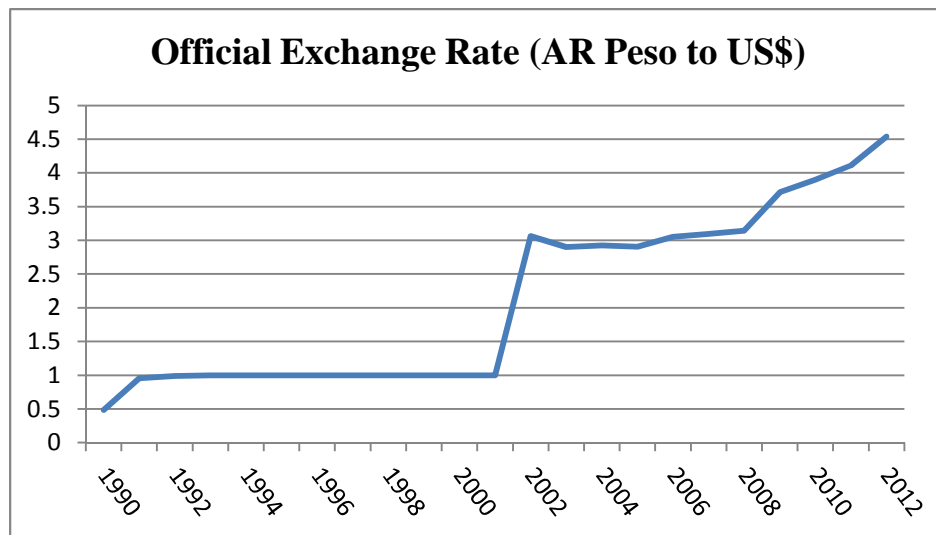
program is not to increase total production but rather to increase the share of production destined for the domestic market, at prices below those in the international market (Richardson, 2008, p. 231).

Since the financial crisis in 2001, the Argentine government has leveraged the value of agricultural export to support the populist policies by providing the government with funding. The huge increases in soybean cultivation provided a unique opportunity for the Kirchner governments to tax these commodities without the tax having a direct impact on the price on domestic food products. The boom in soybean production caused by the transition to genetically-modified (GM) soybeans has led to a continuous expansion of harvested area, record production levels, and record profits from the exports. The expansion of GM soybean production has been coupled with exploding international demand. Rising incomes in China, India, and other developing economies increased demand for soybeans and soybean products as the populations of these countries increased the levels of protein in their diets. Specialty markets like biofuels, industrial oils, and composite materials also added to the increased global demand for soy and its derivatives.

The financial collapse that Argentina experienced in 2001 plunged nearly half of the population into poverty when the unemployment rate reached nearly 21% (Economist, 2008). However, the farmers in the agricultural industry were certainly benefiting from the economic changes. Fairfield estimates that the producer profits would have been 55% lower in 2003 and 2004 if the exchange rate had remained one-to-one as under the Convertibility plan (Fairfield, 2011, p. 432). The real value of the Argentine peso relative to the US dollar fell by more than 60%, making Argentine manufactured goods and agricultural commodities much more competitively priced.



Figure 4 - Exchange Rate Changes



(Calculated from World Bank Data, 2014)

Farmers exporting grain were enjoying the run up in grain prices on the international markets along with the immediate impact of the massive currency devaluation. In turn and in response to these changes, the government imposed export taxes on agricultural products of around 20%, depending on the product. The government justified this temporary measure saying it would, first, discourage the farmers from exporting all of their grain and causing a domestic shortage, and, second, it would contribute directly to the government's budget shortfall and help stabilize the economy. Unfortunately, the temporary measure became permanent while the need was only temporary. To be fair, Argentina did not just tax the export of agricultural products. The government applied export taxes on many different products depending on policy objectives at the time. The average export tax on all products ranged from a high of 15% in 1975 to 0% in 1999. During the Kirchner administrations, the export taxes have averaged 8-9%.

The development of the export-focused, soybean industry in Argentina provided an excellent opportunity for the Kirchner governments to capture tax revenue from agricultural

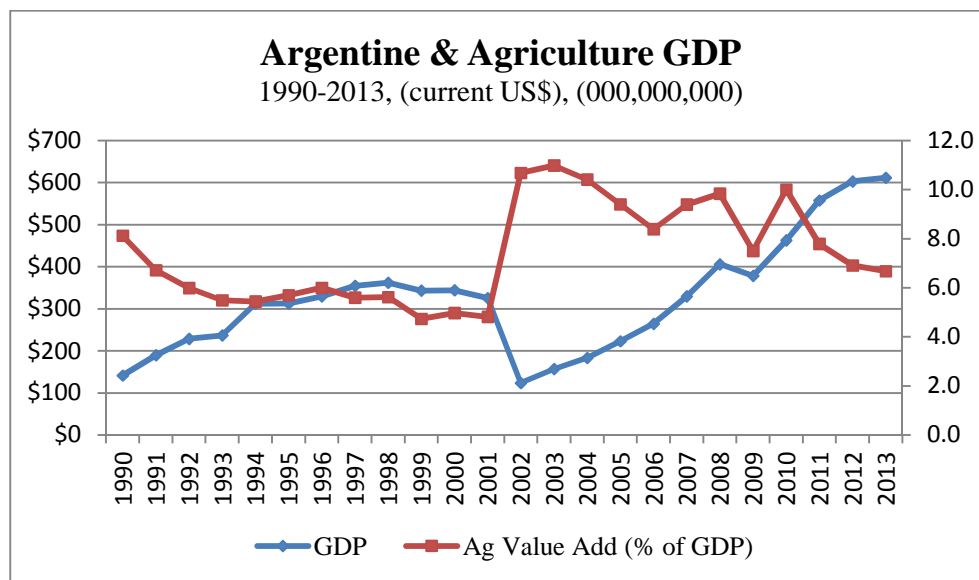
exports to support the government's populist programs. Since 2003, the government has taxed exports, agricultural grain in particular, between 20% and 35%. The logic that the Kirchner governments have used to justify this policy tactic is that because international commodity prices have gone up, farmers have enjoyed a "windfall" profit that they did not earn and should not be allowed to keep (Economist, 2008). The imposed export taxes served several purposes. They extracted revenue needed by the government and supported the administration's industrial policies. The revenue helped support the democratic process by allowing politicians to offer the electorate needed resources and services. The taxes also supported the desire of the politicians to keep domestic food prices from rising and causing domestic unrest by discouraging exports of food commodities to ensure domestic supply (Fairfield, 2011, p. 426).

The strategy to manage the supply and price of domestic food has resulted in taxing farm revenue and limiting access to international markets at a time when, also due to governmental policy, inflation has raised input costs (fertilizer, machinery, and seed) for these same agricultural producers by more than 25% per year. At the same time, the government has been attempting to prop up the Peso relative to the US Dollar. This has made the Peso 60% stronger than it should be if allowed to trade freely (Farming without Fields, 4 January 2014). These factors have worked together to make the food crops that Argentina's farmers could produce abundantly and efficiently too expensive on the international markets to be competitive (The Economist, 30 Sep 2013). It is the combination of high international demand for soybean commodities, the high cost of production inputs for food crops like corn and wheat, and the natural capacity of Argentina to produce soybeans that has contributed significantly to the growth in soy production and export. These market factors have also dramatically changed the make-up of crop production in Argentina. The combination of domestic policies and the

demand in the international markets have forced farmers to make cropping choices heavily weighted to soybean production. It is also clear that due to the government's ability to tax this commodity, the move to soybean production has been instrumental in helping the Argentine economy to stay afloat over the past decade.

The Gross Domestic Product (GDP) for Argentina began to grow in 2003 and has continued to grow over the past decade. While it is clear that GDP has continued to grow through the 2000's despite the default, the growth has not been because Argentina's producers and manufacturing have become more competitive and efficient. The growth has been due to the devaluation of the Peso coupled with the rise in international commodity prices.

Figure 5 - Gross Domestic Product & Agriculture Contribution, 1990-2010



(Calculated from World Bank Data, 2014)

Inflation experienced in Argentina since 2004 has caused much of this advantage from the lower exchange rate to diminish. However, producers have been able to maintain their production (in spite of the export taxes) due to rising international commodity prices for soy products (Lence, 2010, p. 423). The increasing pressure on agricultural producer margins over the past several years (2009-2012) caused by the combination of weather disruptions, less

favorable world market conditions, and the taxes on exports are leading to diminishing incentive for agricultural producers to invest and produce food crops, causing the producers to move more and more of their productive capacity to soybean production (The Economist, 2013).

As the trade surplus in Argentina has dwindled, the Kirchner government has beefed up its industrial policy aimed at protecting domestic industries. According to Global Trade Alert, Argentina now imposes more trade limitations (the current count is 199) deemed “harmful” than any other country in the world. Russia is second with 174 protectionist measures. (Global Trade Alert, 2012). The harsh economic climate created by the government has caused many of Argentina’s agricultural businesses shrink their operations. El Tejar, once Argentina’s largest farming group and still the largest in Latin America, has reduced its cultivated acreage from 300,000 in 2006-2007 to less than 75,000 acres for 2012-2013. The company has also moved its headquarters operation from Argentina to Brazil. (Farming Without Fields, 2014)

#### The Puzzle:

So what has been (or will be) the ultimate impact of the government’s political governance and trade policies on Argentina’s economic fortunes? Most free market economists would expect the protectionist trade policies implemented by the Kirchner government to have a negative impact on GDP. However, it is puzzling that GDP has continued to grow. Most of these same economists would expect Total Agricultural Production (TAP) to also diminish with the imposition of import substitution policies that have targeted agricultural production directly. But again, it is puzzling when most scholars and economists suggest that this is not the case and that TAP has continued to grow at a reasonable level.

I suggest that Argentine agricultural output, much of which is exported, has been and will be impacted by the protectionist policies implemented to promote domestic manufacturing and fund populist programs. A review of the high level national data (GDP, TAP) presents an

interesting puzzle. Are the effects from the protectionist policies hidden somehow in the underlying agricultural industry data and not as clearly evident in the data for Total Agricultural Production? Although agricultural productivity has appeared to continue to rise, are there underlying impacts that will affect productivity in the long term? Have the trade policies had an impact on the level of investment by the agricultural industry? Have the trade policies caused changes in the make-up of the commodities produced in Argentina and causing producers to favor growing some crops (soybeans) over others (wheat/corn).

Since export profitability and therefore farm revenue is hampered (or even eliminated) by high import taxes, export taxes, and an overvalued exchange rate, agricultural investment may be the underlying data that shows where the trade policies have had an impact on the industry. I suggest that although the TAP has remained at reasonable levels, Argentine producers have changed their cropping practices due to the taxation policies pursued over the past decade and have moved to crops that offer better efficiency and profitability. The unintended consequence of these policies has been to move farmers away from food production.

It is possible that a correlation exists between the level of agricultural investment, the rapid adoption of genetically-modified seed, the production of those crops intended for human consumption (food), and the aggressiveness of the protectionist trade policies pursued by the Argentine government since 2003. A high correlation between tax and trade policies and the mix of crops used for human consumption should indicate a move away from food production and toward non-food, genetically-modified, soybean production.

I will look for correlation between Total Agricultural Production and agricultural investment. I define agricultural investment as those expenditures made by agricultural producers to improve their operations, efficiencies and production systems. Although not

necessarily defining causation, the higher levels of taxation should be associated with lower investment. A parallel pattern over time would indicate further that the protectionist policies have had no impact. A divergent pattern in the data would indicate that extractionary tax and trade policies are related to investment in agricultural and on the mix of commodity crops produced in Argentina. This may also be an indicator that the effects on Total Agricultural Production in Argentina are still pending and will develop in the future.

The fundamental problem is that farmers in Argentina are reacting to internal incentives generating from the political environment rather than to the global market forces and prices. This suggests that there are hidden costs to the Argentine agricultural industry and to the Argentine economy as a whole. However, these costs do not appear in the national aggregate data, for either agriculture or the economy.

After the chapter one introduction, chapter two reviews the current literature available on the subject. Chapter three describes the research methods I have used in this study. Chapter four provides a look at the results and the analysis of the data. Chapter five concludes with a discussion on the findings of the study and my conclusions.

## **CHAPTER 2 – LITERATURE REVIEW**

The theory is based on the idea that the liberal market or free market economic approach is the best structure we have for the efficient production of food. The assumption is that government interference in agricultural market economics has distortional effects and these effects will often have negative impacts on productivity. I have organized my review of relevant literature beginning with a review of the theory underpinning free market economics and how extractive political and economic systems negatively affect productive activities. I also review the potential impacts Argentine monetary and trade policies have had on the agricultural sector as the government has pursued import substitution to protect domestic manufacturing.

### **Extractive Policies and Rent Seeking**

The economic deterioration in Argentina in the past several years has been the subject of many studies. There remains some debate about the causes of the decline, especially from those with Keynesian points of view. This economic school of thought, first promoted by John Maynard Keynes, would advocate for a more active role by governments to control the economic excesses inherent in capitalism. Keynesian economists advocate a mixed economy – predominantly private sector, but with an increasing role for government intervention during downturns in economic activity (Binder, 2014). Keynesians in Argentina have criticized the shortcomings of the market system and would argue that the reasons Argentina has not been as successful as it could have been is due to the government not intervening enough to overcome the shortcomings (Bresser-Pereira, 2012). The Keynesian argument is that correcting the inaccuracies of capitalism requires more active government policies to enact effective tariff

barriers to protect developing Argentine industries from foreign competition. This activism would also include allocating public money to areas needed most by society. This economic approach has been effective during times of economic crisis and recession. However, the approach to stimulating a national economy through government stimulus spending is unsustainable over time.

Contrary to the Keynesian theory, free market economists would conclude the cause of Argentina's decline is the unintended consequences of government interference in the market. This is coupled with the extractive nature of the Argentine institutional framework. Fulginiti and Perrin assert that while growth strategies in Argentina have focused on domestic manufacturing production, inconsistent economic policies and market intervention by the state, coupled with irrational responses to external stimuli, have been most responsible for the decline. (Fulginiti & Perrin, 1993). Argentina seems to challenge the notion that Keynesian theories are unsustainable and have maintained aggressive government policies and stimulus through successive democratic regimes. However, it is the contrary. These policies have helped create the recurring crisis in Argentina. This is directly in line with my thesis that the challenges Argentina is facing are directly related to the lack of good rules and governance implemented by the elite political classes.

Supporting the free market school of thought, in his book, "The Mystery of Economic Growth", Helpman makes a convincing free market argument that the protection of property rights, the provision of necessary public goods (like infrastructure and education, and potentially health care), the maintenance of macroeconomic and monetary stability, and at least some level of openness in economic and trade activity are crucial to economic growth (Helpman E. , 2004, pp. 112-113). While there are a range of policies that can promote economic growth



and there may not be a singular model that works in every case, there are a handful of fundamental principles that create the environment for increased economic activity and growth. Helpman argues further that it is these same principles that can help explain why some nations and regions have flourished in agriculture while others have not, even when the other areas should have prospered given their comparative advantages in soil and climate. In the debate between the primacy of institutions or geography as determinants of agricultural income and wealth, Helpman argues that the evidence strongly suggests the primacy of institutions and governance (Helpman E. , 2004, pp. 128-131).

#### Governance and Economics Problems with Export Driven Commodity Economies

The impact of a nation's reliance on the export of commodities or natural resources has also been the subject of some analysis and debate. There has been significant analysis of the particular impact commodity exports (primarily raw materials but also virgin agricultural commodities) have had on the political and economic history of Latin America. Cardoso has linked the reliance on exports to economic under development and argues that an overreliance on commodity exports has led to a lack of economic development in Latin America. He favors a reduction of reliance on single exports in favor of government investment aimed at diversification of industries and exports (Cardoso, 1979). Commodities like oil, iron ore, copper, lumber, soybeans and meat have accounted for 52% of the region's exports, according to the World Bank (The World Bank, 2014). Cardoso and Faletto sought to return the thinking to political economics rather than just economics to understand the development of Latin American agriculture. This perspective certainly supports the argument on the primacy of rules and governance implemented by the state rather than geography, culture, or climate to explain the difference in developmental trajectories of nations and regions. Centeno further links an overreliance on commodity exports to the formation of weak states (Centeno, 2002). The

weakness in Centeno's argument is that he is overly dependent on what the central state governments have not done, namely, they have not developed strong central governments with the requisite institutions to tax populations, organize large, modern armies, and integrate national populations.

An over reliance on primary commodity resources and exports can affect the efficient functioning of government and the development of good institutions. Countries like Argentina that have an abundance of natural resources (like oil and mineral wealth) as well as the wealth of agricultural commodities tend to have lower economic growth and slower development. Collier defines this natural resource abundance as a trap (Collier, 2007, pp. 38-40). According to Collier, the resource curse can cause the normal functions of democratic institutions to malfunction. In natural resource-rich countries, the ruling elite are frequently rewarded for bribery and patronage. Collier terms this "survival of the fittest". The rents from resource abundance cause distortions with how governmental authority is gained (elections) as well as in how the elected ultimately uses that authority (checks and balances). This often leads to a distortion in the relationship between government and citizens. In economies that are dominated by natural resources or primary commodity exports, government can often rely on income from the commodities rather than from taxes on citizens. This will typically make government less responsive to the needs of their citizens (Collier, 2007, p. 42). Dependence on natural resources can also lead to excessive government borrowing. This in turn causes problems when the resource revenue declines due to world prices and the government can no longer borrow enough money to provide for services.

An over reliance on commodity exports can also lead to Dutch disease. This is an issue where the revenues from commodity exports cause damage to other productive segments of the

economy due to distortions in exchange rates (Collier, 2007, p. 39). Too much commodity export causes a country's currency to rise in value against other currencies and makes other products produced within an economy less competitive in price on the world market, as well as domestically. This effect by commodities on the exchange rates and the comparative advantage of other trading goods can be offset, for example, by adopting free trade rules and by managing government finances in a consistently countercyclical fashion (Ground, 2012). However, the government in Argentina has not been able to manage the need to counter these effects and have squandered the windfalls.

Acemoglu and Robinson have explained why some countries are prosperous and efficient agricultural producers while other countries are not (Acemoglu & Robinson, 2012, p. 331). Although there are economists who have used geography or culture to explain the inequality of economic fortunes, Acemoglu and Robinson argue that it is not differences in soil, environment, culture, or even geography that can explain why one nation has efficient agricultural producers while another nation does not. They looked extensively at the effect of the same overall economic rules and governance that Helpman reviewed and then specifically at the impact these institutions have had on Argentine agricultural production (Acemoglu & Robinson, 2012, p. 331).

In spite of variations in attributes, the difference in economic success is more the consequence of property rights (land ownership) along with the rules and governance imposed by the governments and institutions. When property rights are weak, capital is less likely to invest in productive activities because there is less assurance in the ownership of the resulting gain. Extractive taxation also has the effect of reducing the value of real property. For example, if a farmer is not secure with the title to his land or in the profit from his productive

activity, he is less likely to invest in land improvement. In the annexation of YPF, the Argentine government demonstrated that oil companies should not risk their investment in Argentina because the state might take it away. Acemoglu and Robinson argue that the base reason Argentina cannot seem to remove itself from the regular cycle of economic collapse is the very nature of their extractive political and economic institutions (Acemoglu & Robinson, 2012, p. 331). Exclusionary and extractive systems have been prevalent throughout the history of modern Argentina. The early growth that Argentina experienced was a classic case of growth through an extractive economic system and was not sustainable in the long term (Acemoglu & Robinson, 2012, p. 331).

#### Results / Impacts to Argentine Production Post-Crisis

So what would cause this economically prosperous country to make political decisions that would cause one of their primary industries to decline economically? These decisions are a direct result of the nature of the institutional framework in Argentina. This framework is tied to the impact of the democratic electoral process and the unintended consequences of populist policies. Richardson argues that Argentine agricultural producers have had diminished political power and influence needed to affect policies since the rise of Populism. This has been a constraint since the beginning of the populist movement in 1947 and through successive populist governments in 1955, 1973, and 2001. However, this complete lack of political influence reached its nadir in 2003 with the election of the Kirchner administrations. One of the key factors in this phenomenon has been the ability to assign levels of taxation based on the political expediencies of the electoral process. This has been coupled with the limited capacity (or lack of capacity) for agricultural producers in Argentina to form strong political organizations (Richardson, 2012, p. 138). Although much of the recent research on economic development has tended to focus on the political effects of natural resource endowments, such

as oil, copper, and diamonds, Richardson's analysis rightly shows how agricultural commodities can similarly shape political economics and trade policies (Richardson, 2012, p. 146).

There is also an argument that Populism and increased government control have been good for the economy. These scholars contend that soybeans have surged as a crop production system because the government has pursued policies that have correctly created incentives to keep agricultural commodities used as food for domestic consumption (Richardson, 2008, p. 253). Historically, Argentina's main exports have been beef and wheat. These commodities are also the primary commodities for consumption by the population of Argentina. Because soybeans are not consumed domestically, the Kirchner administration could promote and tax their export without causing any domestic issues. At the same time, they could restrict the export of wheat and beef in order to protect domestic supply. This policy framework has allowed Argentina to expropriate rents from the global boom in agricultural commodities and to generate fiscal revenue through soybean exports while protecting its citizens from increased prices for food (Richardson, 2008, p. 254).

How a country's government manages its monetary policy can also have serious consequences for industry and in particular an agricultural industry focused on export markets. Richardson analyzed the impact monetary policies implemented by various governments can have on the efficiency and competitiveness of agricultural producers. When a currency is kept at undervalued rates, input costs for producers are higher due to the pressure of inflation. In other words, in addition to import tariffs, the price of imported seed, fertilizer, fuel, and equipment is higher due to the exchange rates. These factors drive the cost of production higher. I will be looking specifically at the impact of exchange rates on agricultural production.

The Argentine central bank, at the direction of the Kirchner government, has heavily intervened in the foreign exchange markets, preventing the peso from appreciating in value (Richardson, 2009). In order to maintain the advantages of the undervalued peso, the Argentine central bank made a policy of buying incoming foreign currency (dollars), printing pesos, and keeping export manufacturing at a competitive advantage. This greatly stimulated the money supply and the ability of domestic companies to produce products (Gallo, 2012, p. 57). This stimulation has also caused a significant rise of overall inflation in the economy.

The official interest rates published by the Argentine government are seriously understated. While the government's official statistics agency claims inflation is under 10 percent, private economists estimate it to be running at nearly 25 percent (Stewart, 2011). Meanwhile, to avoid international scrutiny, the Argentine government has refused to allow economists from the International Monetary Fund (IMF) to audit its accounts, despite that review being required of all IMF member states. (Stewart, 2011). Because the government's official figures are debatable, the Economist magazine has stopped publishing the government's official figures due to the unreliability of the data (Economist, 2012). As mentioned above, this high inflation has meant that production costs for farmers have continued to rise while the price realization for commodities produced have been limited by internal price controls as well as by external market forces. As the trade surplus in Argentina dwindled, the Kirchner government has continued to reinforce extractionary tax policies.

More recent rulings by the government are likely to further erode confidence in the government and have impacts on agricultural producers. One example of these policies is a trade balancing scheme implemented by the government called the "Company Specific Trade Balancing", which requires that individual companies export the equivalent amount from

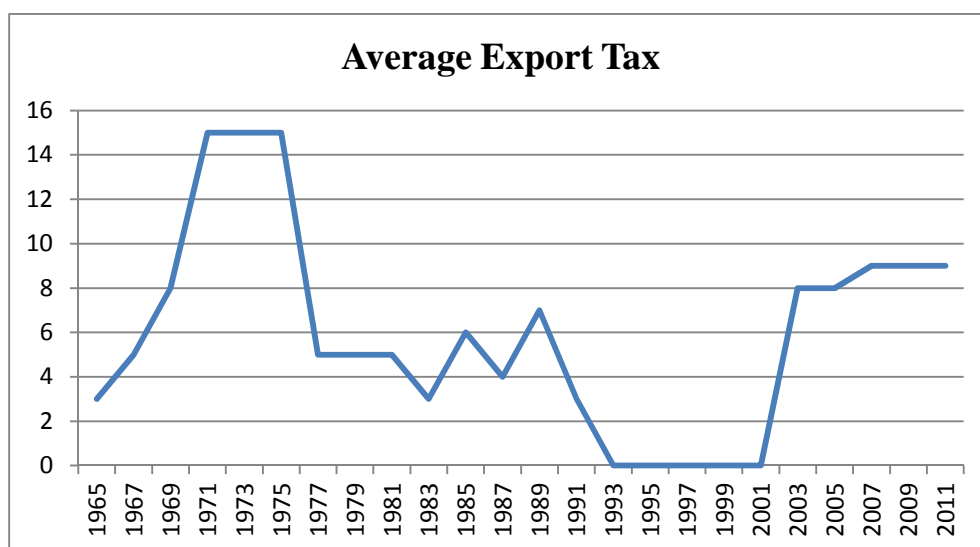
Argentina that they import into the country. This forces companies to make decisions on what products they will produce in order to balance imports and exports rather than on where they can most efficiently produce those products.

The trade policies of the Kirchners have systematically raised the price of domestically produced goods as well as the imported goods. It is precisely the aim of import taxes and quotas to raise the profitability of domestic production of previously imported goods. This allows the local manufacturers to maintain a higher price without competition, regardless of whether they offer a better product or service (Ground, 2012, p. 2). As mentioned earlier, a secondary impact on agriculture of raising the prices for imports and import substitutes is that it also appreciates the foreign exchange rate. As far back as the 1930s, economists have recognized the potential negative impacts of import and export taxes on productive industries. A.P. Lerner published a study in 1936 that theorized the effect of tariffs on relative prices is the same regardless of which policy (import tariffs or export taxes) is applied. By putting tariffs on imports, the government in effect is also effectively taxing exports. This is because by raising the prices of imports and import substitutes through import taxes, the effect is to appreciate the value of the domestic currency, in this case the peso (Lerner, 1936, p. 307). By appreciating the currency, import taxes are effectively raising the price of exports and thereby reducing their international competitiveness. This is why an import tax is equivalent to a tax on commodity exports.

Studies related to the total productivity performance of Argentinean agriculture have been mixed in their assessments of how the trade policies have impacted agricultural production. Some have maintained that the policies have actually helped agriculture by forcing the producers away from wheat and beef and toward more profitable soybean production

(Richardson, 2009, p. 231). However, according to Lence, the experience from the period 1990 to 2001, when import substitution policies reached the lowest level in decades, strongly suggests that the sector is extremely responsive to economic incentives, both positive and negative. This responsiveness has allowed the agricultural industry to adapt to the incentives imposed by government. In other words, the industry has managed to continue in spite of the trade policies, not because of them (Lence, 2010). Brambilla argues further that these incentives have negatively impacted the agricultural industry by forcing production changes. He demonstrates the impacts through an analysis of the annual rates for export taxation. The average export taxes applied to Argentine exports through the period 1965 to 2010 are on the chart below.

Figure 6 - Argentina Export Tax Rates, 1965-2011



(Brambilla, Galiani, & Porto, June 2011, p. 32)

The most striking difference in these trade policy trends occurred in the 1990s and is consistent with the liberalization associated with the administration of President Menem (1989-1999). Unfortunately, this period and administration was also known for corruption, bribery allegations and the embezzlement of public funds. Brambilla argues that this lowering of tariffs



and trade liberalization freed the agriculture industry to make decisions on the basis of efficiency and market conditions rather than making decisions due to tariff rates. During the periods of reduced export taxation, Argentine producers rapidly adopted new cropping technologies and expanded their soybean acreage in production. There were significant shifts to more productive cropping practices and crops. The economic crisis of 2001 and the need for the government to improve its fiscal revenues led to a reversal in the liberal policies that had begun to help improve the health of the agricultural sector (Lence, 2010). The trade liberalization period ended with the Kirchner administration in 2003 and export taxes were again actively used as industrial policy (Brambilla, Galiani, & Porto, June 2011, p. 13).

The tendency to pursue extractive trade policies demonstrated by the Kirchner administrations is beginning to have serious impacts on the agricultural economy in Argentina. The Crop Site published a study in April 2012 on the impact of the export controls imposed by the Argentine government. It shows that for the past several years, Argentine farmers have been impacted by government controlled commodity export limits (5M Publishing, 2012). These export limits, coupled with the increasingly significant export taxes, have further discouraged overseas sales. The government argues that these controls are necessary to protect domestic food prices. As a consequence, with one product as an example, wheat producers have become discouraged as the government has attempted to control the price of bread in order to keep the domestic market well supplied. When a producer does not earn enough to cover the cost of production it will discourage production. As a consequence, Argentina's farmers are sowing the least amount of land in wheat as they have since 1979. This is an area that should be a breadbasket for the Argentine nation and the world (5M Publishing, 2012). This is an example of how the government's trade policy has impacts on the composition of the commodities

produced within the Total Agriculture Production. On the other hand, soybean products have benefited from the fact that they are not directly a food staple in Argentina and have thus been spared from the export limits. The government has warped the incentives structure for the agricultural producers in favor of soybeans. It has in turn taxed these exports accordingly.

The combination of direct taxation on imports and the indirect taxation on ag exports through import taxes on inputs, coupled with putting actual export taxes on commodities have had detrimental effects on the Argentine economy overall. Ground predicts that these policies, over time, will lead to recurring balance of payment, fiscal and debt crises and force periodic and costly adjustment (Ground, 2012, p. 3). The protectionist trade policies pursued by the Kirchner regime should cause agricultural output to stagnate or contract. The profitability of exportable commodities is squeezed by both the import tax on inbound manufactured products, the effect of the import tax on the exchange rate (pushing the value up), and by the export taxes on the exported agricultural products. The net effect should be that these policies should lead to economic stagnation and decline (Ground, 2012, p. 5).

However, Argentine farmers have managed to increase their output of large grains and are the third largest producers of soybeans in the world. This outcome is puzzling. W. D. Reeder asserts that the global commodities boom, coupled with the currency devaluation as well as keeping the currency undervalued have been enough stimuli and have helped overcome the negative challenges faced by agricultural producers. Although the export taxes on agricultural commodities have certainly had negative impacts on agricultural production, the 60% currency devaluation had a larger impact on the ability of Argentina's farmers to produce and export soybeans. The devaluation made Argentine exports more competitively priced on the international markets. (Reeder, 2007)

The distortional impact of tax and trade policies on crop production can be particularly detrimental to poorer, developing countries by reducing their ability to compete in international markets (Rakotoarisoa, 2010). Rakotoarisoa did a relevant study of this phenomenon on rice production. Although this is a different crop than I am investigating, the model he developed is still applicable. His model shows that high levels taxation of rice in poorer, developing countries actually widens the gap in production between those countries and more economically developed countries with the same crops. This is especially true when comparing to countries that support their own crop production through subsidies and protection (Rakotoarisoa, 2010). Fulginiti and Perrin did a different study in 1997 to examine agricultural productivity change in eighteen countries, including Argentina, for the period 1961-1985. They were analyzing the impact of tax and trade policies and estimated that agricultural productivity fell -4.8% in Argentina due to the government's tax and trade policies. In their analysis, the authors argued that a lack of investment leading to technological regression was largely responsible for the productivity decline. (Fulginiti & Perrin, 1997) Their analysis ended in 1985. I will be looking at similar data from 1985 through the more liberalized trading regime of the 1990s and through 2013.

There has also been some regional analysis of changes in agricultural production. The agricultural productivity of Brazil has continued to show improvement and has been to subject of extensive analysis. One such study by Helfand and de Rezende shows relative total agricultural production of Brazil was higher compared to the other countries in Latin America (Helfand & de Rezende, 2002). Another regional study on Paraguay investigated agricultural productivity growth rates from 1970 into the early 2000s and showed that total productivity has improved with more liberalized policies and governance. Paraguay was a military dictatorship

until 1989 and was subject to significant political, social, and economic instability. This study focused on the technical as well as scale efficiencies of agricultural producers. (Fletschner & Zepeda, 2002). Although Uruguay is the smallest country in MERCUSUR and unable to take advantage of economies of scale, it is still primarily dependent on agricultural production for its GDP and the total agricultural production levels have been relatively stagnant throughout the 1990s. Hudson and Meditz attribute this slow growth rate to the inconsistency of state policies toward the agricultural industry. They also point to the very slow adoption rates for new technology among the producers (Hudson & Meditz, 1992). Chile, an associate member of Mercosur since 1995, has also seen a surge in its agricultural productivity, especially in exports like fruit and wine. Much of this growth can be attributable to land reform and privatization along with the Chilean government's investment in infrastructure. These changes have received a big boost through the implementation of market oriented policies by the Chilean government. (De Janvry, Key, & Sadoulet, 1997)

A factor that complicates our understanding the true impact of trade policies on agricultural production is the complexity of data as crop production systems change over time with the development of new technologies such as genetically modified (GM) seed. Prior to the mid-1970s, Argentina was not a primary producer of soybean products. Today, Argentina is the third largest producer of soy with a 17% share of world product. Some authors have suggested that the dramatic growth of soybean production in Argentina (as well as in Brazil, Paraguay, and Uruguay) is the result of better technology. The combination of direct seeding, inorganic fertilization, efficient mechanical harvesting, and the herbicide-resistant GM soybean has made the crop production system more technically and economically efficient. (Ministry of Agriculture, Livestock and Fisheries of Argentina, 2013). The US Department of Agriculture

Economic Research Service (USDA ERS) has also suggested that the growth in soy production is due to Argentina having an absolute comparative advantage. The ERS has conducted research on production costs that supports the comparative advantage argument. (Schnepf, Dohlman, & Bolling, 2001, pp. 53-60) However, the limitation in these analyses by both the ERS and the Ministry of Agriculture is that although Argentina has comparative advantage for the production of soybeans and soybean-based products, this attribute does not fully explain Argentina's move away from other crops. In particular, those crops and commodities that are critical to human food supply, both in Argentina and for export to the global population.

### **CHAPTER 3 - METHODOLOGY**

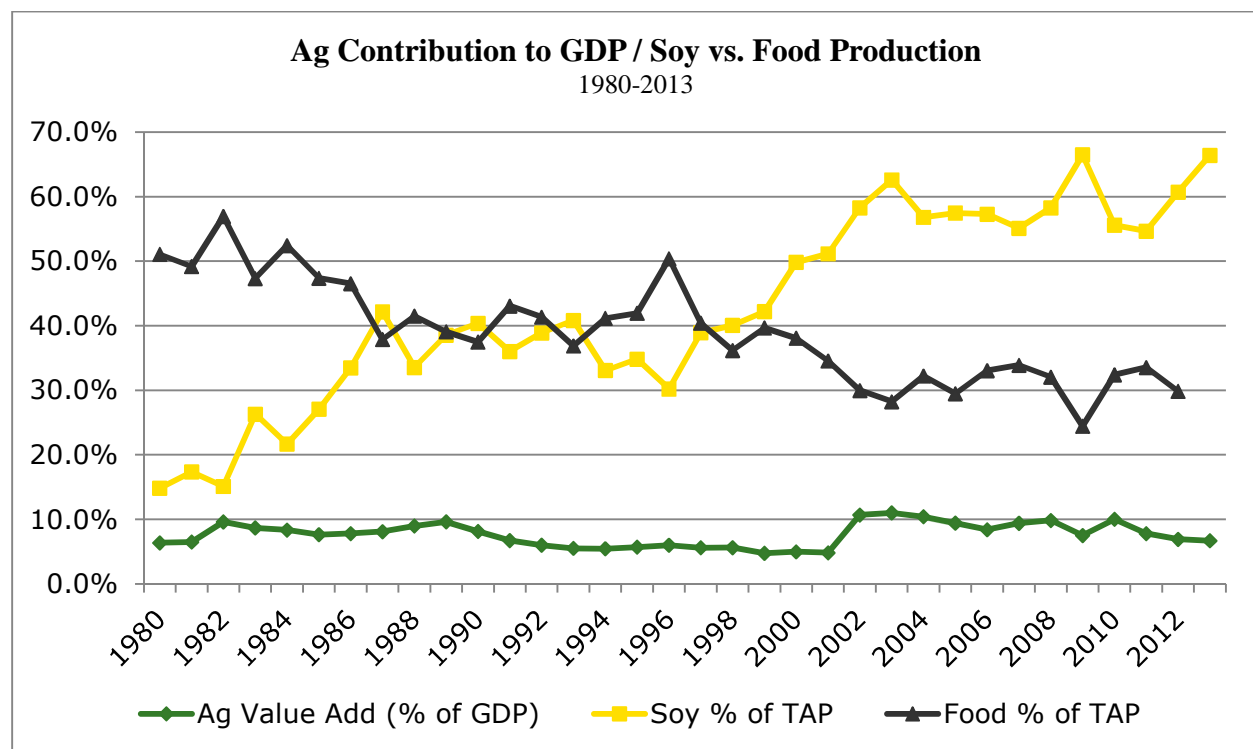
The purpose for this chapter is to describe the methodological approach I have used for this research. The goal of the research is develop a better understanding of what, if any, impact the trade and monetary policies employed by the Argentine government have had on agricultural production or on agricultural investment at the producer level. Given the primary objectives of the research and the datasets available for analysis, I have employed a combination of case study and quantitative analysis to the research. The methodology includes analysis of data obtained from the USDA (US Department of Agriculture), INTA (Argentina National Institute of Agriculture Technology), FAO (Food and Agriculture Organization), The World Bank, and Index Mundi to develop applicable annualized data useful for time series quantitative comparison.

The approach to this empirical research is a historical case study. I believe that the Argentine agricultural economic challenges are best explained with analysis of long-run historical data and comparing year over year changes in the data to changes in the policy environment during the same period to confirm or deny an impact of those policies. Isolating for aggressive trade and monetary policies and programs provides a more refined comparison and allows us to test the effects of rules and governance on agricultural economic circumstances.

To compare the effects of the trade and monetary policies, I have used annual data for the years 1975 through 2012. One of the major challenges has been getting data that are complete and consistent for the entire period. This study focuses on grain production (wheat, corn, soybean) and is heavily concentrated in the central-eastern region of Argentina known as the Pampas, one of the most productive agricultural areas in the world and one that is of major importance to the Argentine economy (85% of the total grain production) (Nogués, 2011).

Wheat and corn have been the principal crops in the region for the last 100 years with soybean and soy products being a much more recent addition. Agriculture has always been a key contributor to the Argentine GDP. In the chart below, this contribution has ranged from 4.4% to 11.0% of GDP. As the contribution of soy products on the chart shows, even as recently as 1980, soybeans represented only 15% of agricultural production in Argentina. However, soybeans now represent more than 66% of the Total Agricultural Production (TAP). This dependence on a single crop may create problems with maintaining the level of production.

Figure 7 - Agriculture Contribution to GDP / Soy vs. Food Production, 1980-2013



(Calculated from World Bank Data, 2014 and John Deere EMR, 2014)

The crop production systems historically characteristic for the Pampas area include corn and soybean rotation and wheat-soybean double crops. This crop rotation cycle allows the soil to remain vibrant and fertile and ultimately reduces the need for fertilization. The Pampas region presents many characteristics of modern agriculture (techniques of rotating crops,

modern inputs and technological knowledge) which makes it comparable, for example, with the American “Corn Belt”.

In compiling the data for analysis, I employ both official statistics on production and governmental financial indicators as well as data from the agricultural sector. Previous studies have used Total Crop Value and Agricultural Contribution to the Argentina GDP, however, this may hide some of the negative effects of domestic policies on agriculture. To fully understand and investigate the impacts of the policies, we need to examine more localized, micro production data. I have reviewed various ways to quantify the impact of the trade and monetary policies pursued by the Argentine government during the period 1975-2012. The first and most obvious would be to measure changes in the level of production that farmers have been able to attain over time with changes in trade policies. The expectation from this approach would be for the macro data to reflect the impacts of the policies. However, the broad indicators like Total Crop Value and the Agriculture Share of GDP have continued to rise even when most free market economists would have forecasted a diminishing level of total production due to the reduced level of incentive for the producers. This would seem to indicate that either the policies had no impact, that the effects of the policies are manifesting themselves at another level, or the impacts will show up later in time. Therefore, a different analysis is required to understand the implications.

The approach I have selected is to analyze underlying agricultural data for potential impacts using two methods. 1) The first is to analyze the correlation between trade policies and the commodity mix in production to understand if the trade policies are affecting commodity production decisions by farmers. The data I have used to analyze this is Export Tax rates compared to Crop Production Volumes and Food Production per Capita. 2) The second



approach to the data is to analyze the relationship between trade policies and the level of agricultural investment by producers. The data for this analysis is Capital Investment, Land Investment, and Equipment Investment in correlation to Export Taxation.

There are several datasets I have reviewed and compiled for the analysis. The table below shows the type of data along with the data source and a description of the data elements.

**Figure 8 - Data Sets and Definitions**

<b>Data Type</b>	<b>Source</b>	<b>Description</b>
<b>Agricultural Share of Exports</b>	World Bank World Development Indicators (WDI)	Agricultural raw materials comprise crude commodities and materials except fuels and exclude crude fertilizers and minerals.
<b>Ag Share of GDP</b>	ECONSTATS; <a href="http://www.econstats.com/wdi/wdic_ARG.htm">http://www.econstats.com/wdi/wdic_ARG.htm</a>	Agriculture, value added (% of GDP); Includes forestry and cultivation of crops and livestock production. Value added is the net output of a sector after adding up all outputs and subtracting intermediate inputs.
<b>Arable land (hectares)</b>	World Bank Agricultural Data	Arable land includes land under crops, meadows for pasture, and land temporarily fallow. Land abandoned as a result of shifting cultivation is excluded.
<b>Crop Production Index</b>	World Bank World Development Indicators (WDI)	Crop production index shows agricultural production for each year relative to the base period 2004-2006. It includes all crops except fodder crops.
<b>Crop Value - Corn</b>	Data Source: John Deere Enterprise Market Research	Calculated.
<b>Crop Value - Soybeans</b>	Data Source: John Deere Enterprise Market Research	Calculated from Data Edge historic database, 2012
<b>Crop Value - Wheat</b>	Data Source: John Deere Enterprise Market Research	Calculated.
<b>Export Tax</b>	Argentine Trade Policies in the XX Century: 60 Years of Solitude; Brambilla/Galiani/Porto; Pages 32-35	Average Tax on Exports (% ad valorem)
<b>Fertilizer consumption</b>	Food and Agricultural Organization (FAO) statistical database	Annual Consumption in Tons. Fertilizer products cover nitrogenous, potash, and phosphate fertilizers. Traditional nutrients--animal and plant manures--are not included.
<b>Fertilizer consumption per hectare of land in</b>	World Bank Agricultural Data; FAO Data; Calculated from Tons to KG per Hectare	Fertilizer consumption measures the quantity of plant nutrients used per

<b>production</b>		unit of arable land.
<b>Food production index</b>	World Bank World Development Indicators (WDI)	2004-2006 = 100. Food production index covers food crops that are considered edible and that contain nutrients. Coffee and tea are excluded because, although edible, they have no nutritive value.
<b>Food production per capita</b>	Calculated from Data at John Deere Enterprise Market Research & the World Bank	Using the combination of crop production values for Corn, Wheat, Barley, and Rice. These are primary products for food consumption for people. Divided by Total Population.
<b>GDP Per Capita</b>	World Bank World Development Indicators (WDI)	This is GDP divided by the midyear population. Data is in current U.S. dollars.
<b>Gross Domestic Product (GDP)</b>	World Bank World Development Indicators (WDI)	GDP is the sum of gross value added by all resident producers in the economy. The data is in current U.S. dollars. The dollar figures for GDP were converted single year official exchange rates.
<b>Land Development Investment</b>	FAO statistical database	Constant 2005 prices, US Dollars (millions)
<b>Machinery &amp; Equipment Investment</b>	FAO statistical database	Constant 2005 prices, US Dollars (millions)
<b>Population</b>	World Bank World Development Indicators (WDI)	
<b>Tariff rate, Imports</b>	World Bank World Development Indicators (WDI)	Weighted mean, all products (%); This is the average of applied rates weighted by the product import shares. Tariff line data were matched to Standard International Trade Classification (SITC) revision 3 codes to define commodity groups and import weights.
<b>Total Capital Investment</b>	FAO statistical database	Constant 2005 prices, US Dollars (millions)
<b>Total Crop Value</b>	Data Source: Calculated from Data Edge historic database, 2012 (John Deere Enterprise Market Research)	Measured in US dollars. This is a measure of the total value of crop production used to generate revenue by agricultural producers. This is a proxy for Gross Farm Revenue (GFR).

Once I had gathered the data from the various sources and formatted them for analysis, I used SPSS (Statistical Package for Social Scientists) to help refine the statistical relationships among the various data. For correlation in both analysis methods, I am using the level of

taxation on exports as a proxy for aggressive and extractionary trade policies that could have impacts on agricultural production. The focus is to identify periods when Argentina has had higher than average tariffs, has had incentives on domestic industrial production, has implemented quotas on imported goods, and / or has levied taxes on exports. The theory is that these would be primary indicators of extractive trade policies aimed at supporting domestic production and leveraging the value of agricultural production. I have chosen the average annual export taxation value as a proxy for these policies.

Hypothesis one is that with higher levels of export taxation results in lower crop production values. The higher levels of export taxation coupled with export quotas have also negatively impacted food production in Argentina. Using the level of export taxation as the independent variable, the following disaggregated commodities are the dependent variables.

- Crop Production Index
- Crop Value - Wheat
- Crop Value - Corn
- Crop Value - Soybeans
- Food Production Index
- Food Production per Capita

With this analysis, I will be looking for a correlation between export taxation and the make-up of the commodities produced and the affect these policies may have had on the level of production of commodities that are primarily for human consumption.

Hypothesis two is that higher levels of export tax results in lower levels of capital investment in production agriculture. The theory is that if the state is taking a portion of the revenue from agricultural exports and the market controls the price available to the farmer, the impact of the tax is directly on the farmer. Does this extractionary tax affect investment decisions the producers are making? Will these decisions impact the ability of the producers to be efficient in the longer term? I am using Total Crop Value as a proxy for GFR (Gross Farm

Revenue). Using the following dependent variables, I expect to find a correlation between agricultural producer revenue and the investment of resources by agricultural producers that will likely have longer term impacts on Argentina's ability to produce agricultural products.

Using the level of export taxation as the independent variable, the dependent variables for this analysis are the aggregate values of the following:

- Total Crop Value
- Total Capital Investment
- Land Development Investment
- Machinery and Ag Equipment Investment
- Fertilizer Consumption
- Arable land (hectares)
- Fertilizer consumption per hectare of land in production

In addition to data analysis, I had a few of informal conversations with people in and around the agricultural industry in Argentina, primarily people that I am associated with through my work with John Deere. The primary purpose for these interviews / conversations is to add some richness in perspective from those people most affected by the trends in the data and add some level of understanding for how people affected by the changes perceive the trends seen in the data. I will cite my conversations with those individuals as anecdotal references in the discussion chapter.

## **CHAPTER 4 - RESULTS & ANALYSIS**

Regardless of what a policy is intended to do by the government that is implementing the policy, bad policies usually have bad results. The case of Argentine policies and their impacts on the Argentine agricultural industry is no exception. While the effects of the tax regime implemented in Argentina are not readily apparent in the macro economic data, we can see their long term effects in the changing structure of the agricultural sector. Some of the effects are found in the lower sophistication of agricultural practices by Argentine producers in comparison with producers in other countries with similar natural advantages. The impacts materialize in the value of land, the agricultural investment other than land (permanent silos, irrigation, tiling), and the changing make-up of the commodities produced.

Although a cursory review of the economic data for Argentina shows continued growth in the major economic indicators like GDP and Total Crop Value, Argentina's economy has declined in real terms since 1990. Figure 9 below shows the evolution of some of the key economic and agricultural indicators for Argentina since 1975. It appears from each of the main economic indicators that Argentina is doing very well, with a growing GDP and per capita GDP. However, to fully understand the economic situation and the changes that are occurring requires a more in-depth look.

**Figure 9 - Key Economic Indicators, Argentina, 1975-2012**

	1975-1979	1980-1984	1985-1989	1990-1994	1995-1999	2000-2004	2005-2009	2010-2012
Population	26,887,709	28,996,259	31,255,006	33,516,432	35,682,383	37,616,633	39,333,572	40,729,963
GDP (000)	\$57,544,869	\$84,603,472	\$102,660,204	\$210,809,061	\$281,102,350	\$187,533,490	\$258,353,247	\$430,093,960
GDP Per Capita	\$2,137	\$2,916	\$3,287	\$6,270	\$7,875	\$5,006	\$6,553	\$10,553
Total Crop Value (Annual Avg. 000)		\$6,344,636	\$5,117,374	\$6,691,319	\$9,715,398	\$12,450,029	\$24,000,579	\$39,810,925
Ag Share of GDP	7.6%	7.9%	8.4%	6.4%	5.5%	8.4%	8.7%	8.2%
Ag Share of Exports	11%	9%	9%	7%	7%	6%	3%	

2Footnote3

---

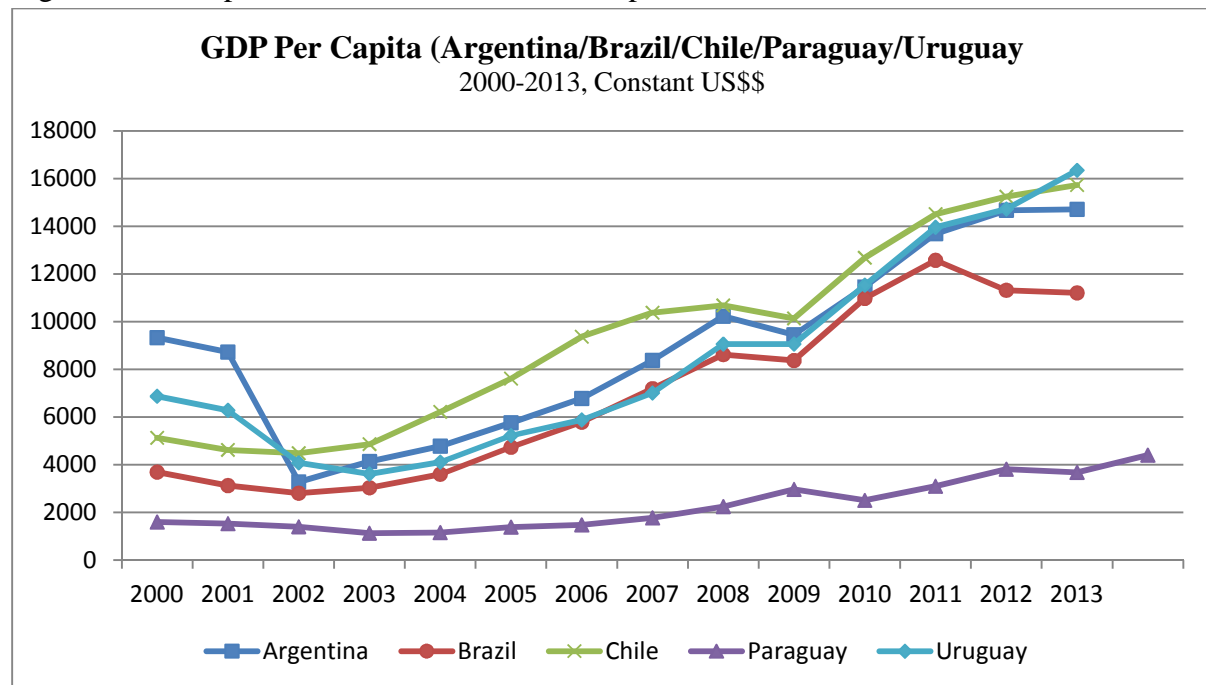
Footnote

<sup>3</sup> Data for population and GDP figures compiled from World Bank World Development Indicators; Crop Value is from John Deere Enterprise Market Research; Ag Share of GDP and Exports is from EconStats

For example, the data in Figure 9 does not account for the negative and corrosive effects of inflation. Unfortunately, the Argentine government has decided not to report the data that would allow The World Bank to publish these statistics. Officially, the inflation rates in Argentina have averaged 8-10%. Unofficially, and more accurately, the latest estimates put the annual inflation rates at around 35% per year (Romig, 2014).

In addition to reviewing the data specific to Argentina, I have also considered this macro-economic data in comparison to other nations with similar development. For example, in the chart below, we are comparing the per capita GDP growth of Argentina to the other nations in the southern cone of Latin America. The per capita GDP for Argentina has grown at the same rate as the other countries.

**Figure 10 - Comparison: Southern Cone Per Capita GDP**

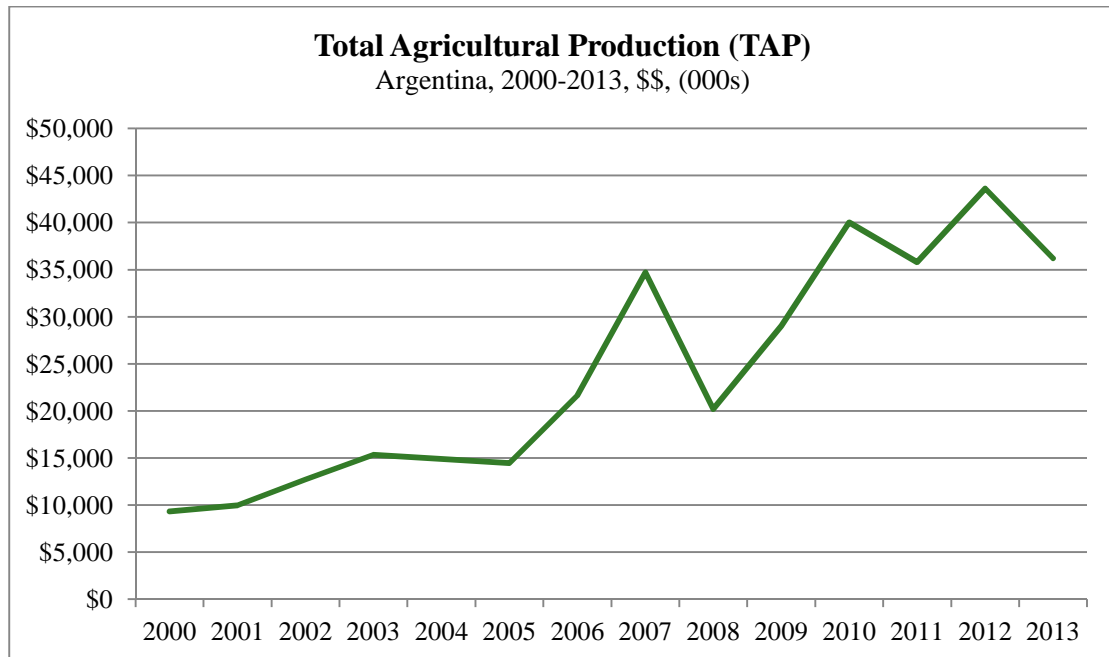


(Calculated from World Bank Data, 2014)

A macroeconomic measure similar to GDP but specific to the agricultural industry is the Total Crop Value of Production. This is a measure of value created by the aggregate economic

output of all agricultural production in a country. As shown in the chart below and similar to GDP and per Capita GDP, Total Crop Value also appears to have grown remarkably well.

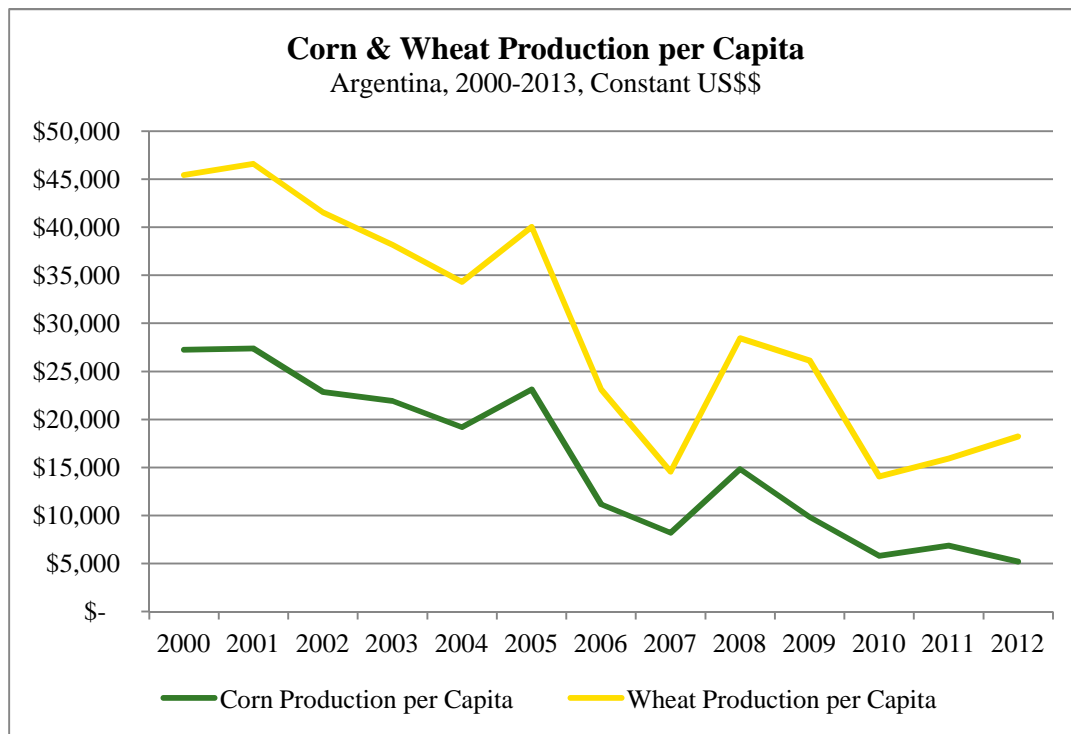
Figure 11 – Total Crop Value of Production, Argentina, 2000-2013



(John Deere EMR, 2014)

According to both John Deere Enterprise Market Research and the Food and Agriculture Organization Data Service, total agricultural production in Argentina has increased since 2000. However, it is the changes within the makeup of the agricultural industry and the crop practices adopted by the producer farmers that is troubling. The overall efficiency of agricultural production in Argentina continues to decline relative to the country's capability and comparative advantage. Even though the production of soybeans has climbed over the past decade, other crop production, specifically commodities for human consumption, have been declining. The chart below shows the changes in per capita production of products more closely associated with human consumption, corn and wheat. The implications are clear that the production value of both of these commodities has declined during the same period that total crop production has increased.

Figure 12 – Corn & Wheat Production per Capita, Argentina, 2000-2013

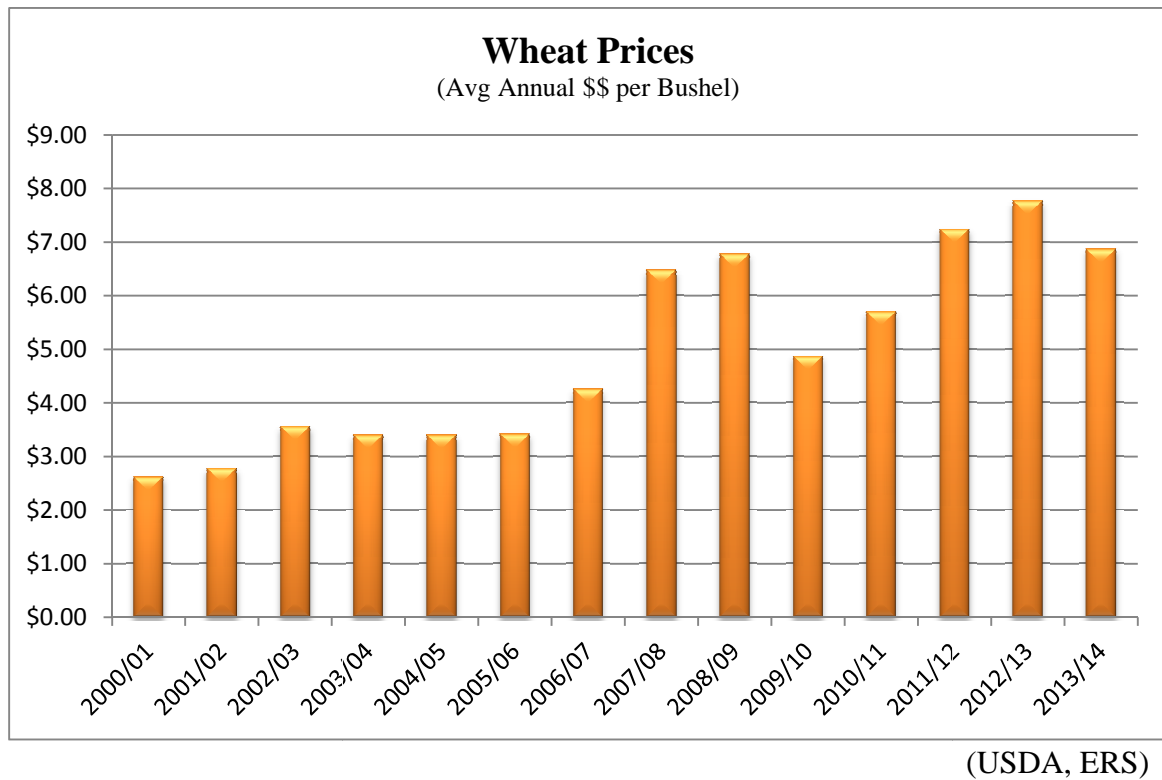


(John Deere EMR, 2014)

Understanding why this change is occurring also requires an understanding of the market forces outside of Argentina and how these factors might be affecting commodity mix. Is it possible that the farmers in Argentina were making rational choices in response to changes in international market prices? To answer that question requires a review of the market prices for wheat during the period 2000-2013. The chart below shows the annual international wheat prices from 2000 to 2013.

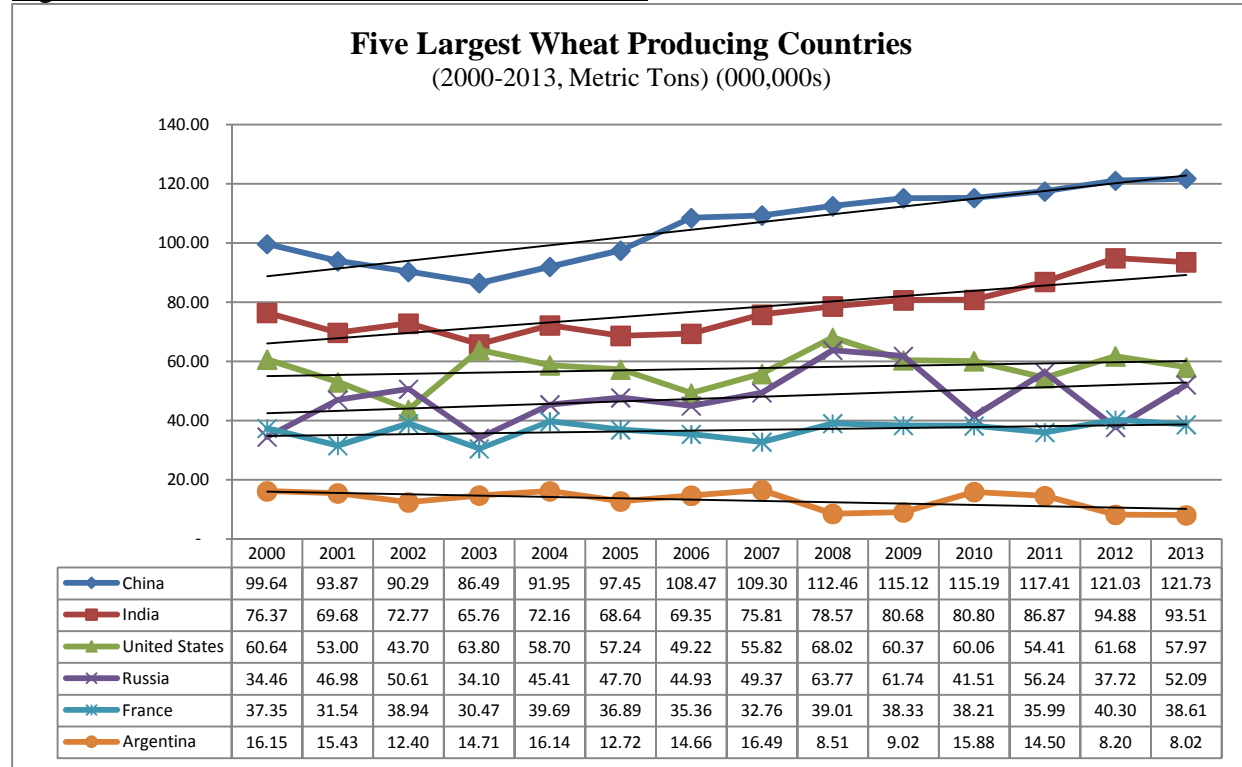


Figure 13 – International Wheat Prices, 2000-2013



The data along with the level of wheat production for the other primary wheat producing countries during the same period both suggest that wheat farmers have been changing crop mix due to domestic policies and not international market conditions. The chart below shows the level of production for the leading global wheat producers. In every case, the largest wheat producer's trend lines show increased production during the period. Argentina is the exception with a declining level of production. Argentina was the 13<sup>th</sup> largest wheat producer in the world in 2000, producing 16 million metric tons. It is now the 18<sup>th</sup> largest and produces half that amount.

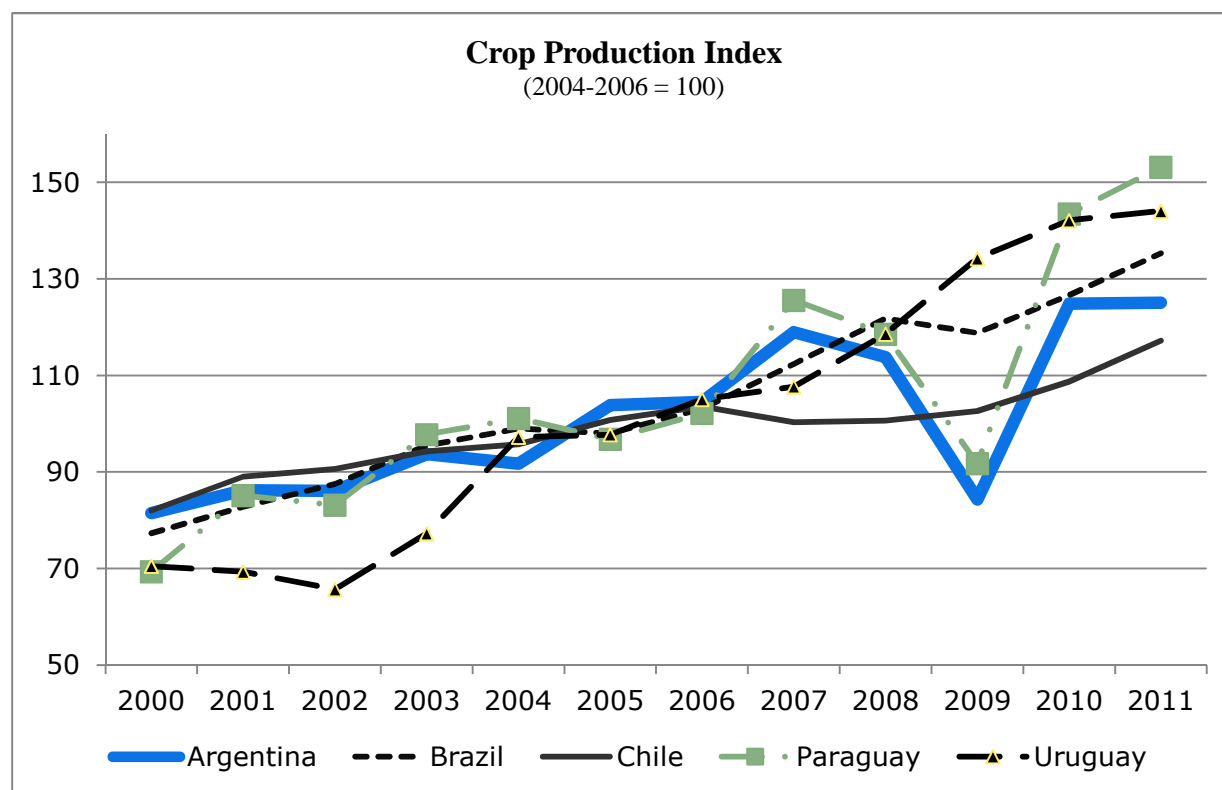
Figure 14 – Wheat Production Levels, 2000-2013



(Calculated from data at Food and Agriculture Organization of the United Nations, 2014)

As with other economic data, it is helpful to compare the production results for Argentina relative to the other nations with similar agricultural practices and potential during the same period of development. The chart below demonstrates the change in total crop production since 2000 and compares the production in Argentina to that of Brazil, Uruguay, Paraguay, and Chile. This is an index measure that compares total crop production within a country with the average for that country set to a baseline period of the years 2004 through 2006. In 2000, Argentina's Crop Production Index was closest to Chile and among the highest in the region. By 2011, Paraguay, Uruguay, and Brazil had surpassed both Argentina and Chile. Due to structural reforms in their domestic policies, Chile's current trend line is more positive than Argentina's. It is clear that the production of agriculture overall has diminished relative to the gains made by the other nations in the region.

Figure 15 - Crop Production Index, MERCUSUR, 2004-2006



m,

(Calculated from data at Food and Agriculture Organization of the United Nations, 2014)

Some of the consequences of the policies pursued by Argentina since 2003 can be seen in the lower investment in permanent infrastructure projects by agricultural producers. One such activity has been the development and use of ag bags for the storage of grains rather than permanent silos. The financial crisis in 2001 compounded already chronic underinvestment in Argentina's agricultural infrastructure. Silos were in short supply and the financial means to build more were limited. Without enough silos, farmers could not store their harvested crop. If market prices at harvest are low, without storage, the farmers cannot wait for the prices to improve. As a consequence, Argentina has developed an entire supporting industry around the use of infield, on ground, grain storage. In circumstances that producers in similar conditions in other countries would invest in permanent silos, Argentine producers invest in ag storage bags

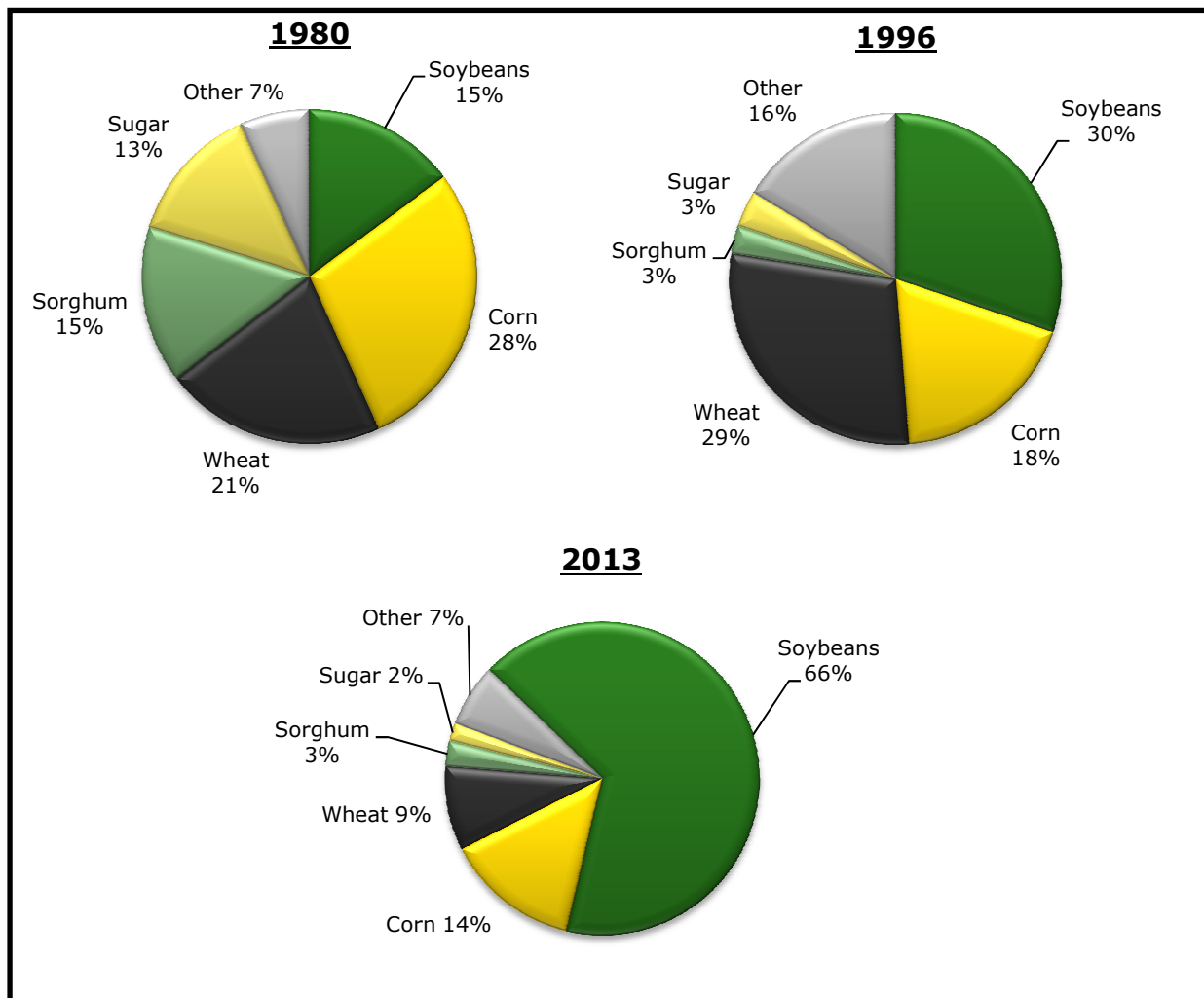
and the equipment to support these activities. The cost to invest in ag bags is roughly a third of the cost to build permanent silos. Silo bags are made of strong, durable fibers and can hold up to 20 tons of soybeans in each. At harvest, a special machine would fill the bags in the field, where they could be left lying horizontally for up to five months. Silo bags had only a tenth of the storage capacity of most silos, but they were cheap, easy to use, and allowed producers to store their crops until prices improved or when transportation was more readily available. This suggests that the confiscatory policies of the government that the agricultural producers in Argentina have much less incentive or resources to invest in more expensive infrastructure projects, like permanent storage capability.

How is it possible that policies that are this distortionary have continued to be implemented? It is partly due to the unique features of the agricultural sector that have allowed the highly distortionary export tax structure to remain in place. It is unique to agriculture that the effects produced by the extractionary taxes do not always show in the average macro indicators. This uniqueness also helps explain the attractiveness of taxing the expansion of the soybean industry to the politicians within the Argentine government. It has been very fortunate for Argentina that production efficiency has been exploding at a time of increasing international demand for a product (soybeans) that has very little use in the domestic Argentine marketplace. Apparently to the Argentine political elite, the taxes applied to the export of soy products only affect the windfall gains of agricultural producers. They appear superficially to have no direct cost to Argentine society as a whole.

It is also clear from the data that overall crop production in Argentina has changed significantly since 1980, both in the quantity of the production and in the mix of commodities produced. While the total production has grown steadily, there have been significant changes in

the makeup of individual commodities within the total and this change is directly correspondent to the government's taxation policies. The most significant of these changes has been the growth of soybean production and the absolute decrease in food crops grown for human consumption. The pie charts below show the changing makeup of the major commodity crops in Argentina for 1980, 1996, and 2013.

Figure 16 - Changing Commodity Production, 1980-2013



(IHS Global Insight, 2014)

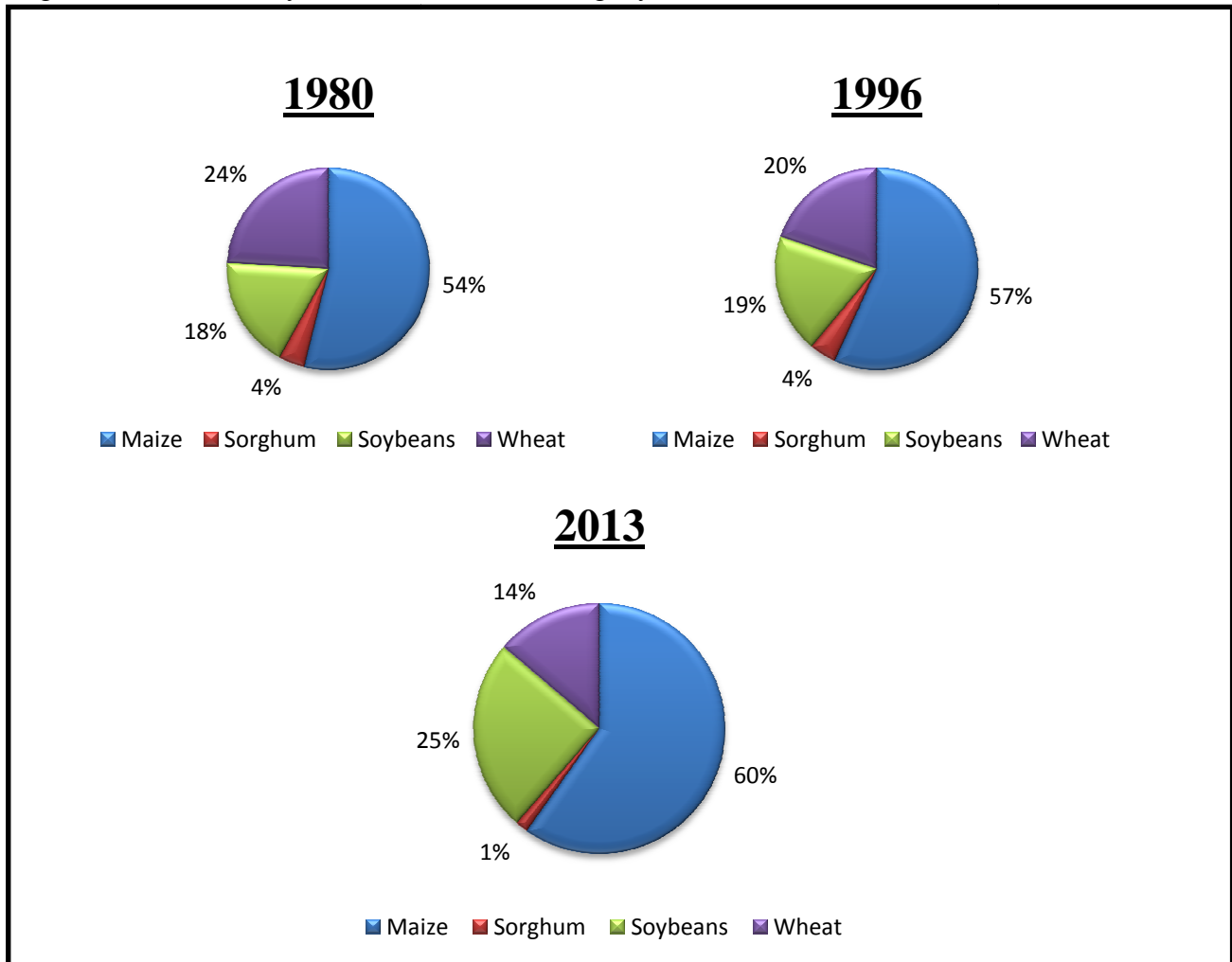
In 1980, corn and wheat production made up 49% of total agricultural production. Per capita wheat consumption used for bread, which averaged 111 kilograms per capita per year in 2003, was among the highest in the world. Only 4 out of the 66 countries classified as high-

income economies ranked higher in consumption (Calculated from data at Food and Agriculture Organization of the United Nations, 2014). Soybeans were only 15% of the total in 1980. Even as recently as 1996, corn and wheat made up 47%. Soybeans production was expanding and by 1996 made up 30% of the Total Agricultural Production, displacing sugar and sorghum.

Argentina agriculture adapted well to soybean production because it was profitable, grew well in the Pampas, and has been an excellent rotational crop to corn and wheat. The impact of GM seed also dramatically reduced the input costs and increased the production value of soybean products. Argentine agriculture was developing with good balance and was not dependent on any single commodity. This all changed under the Kirchner leadership and policies. The evolving pattern in crop output has been induced by the changing incentives for producers. These changing incentives have been caused by a combination of developing international market conditions with increasing market demand for the product. By 2013, more than half of the arable land and 66% of the total crop production in Argentina was dedicated to soybeans.

In comparison to other leading wheat producers in the Western Hemisphere, this has been a dramatic change toward soybean production. The charts below show the mix of the primary crops for the other wheat producing nations, Brazil, Paraguay, Canada, and the US. While the mix has changed in favor of producing more soybeans, the change from 18% to 25% soy production is not exceptional. Corn production also went up from 54% to 60% in 2013. The percentage of wheat production has gone down compared to the other crops; however, the actual production by tonnage has remained nearly constant in these four countries. It remained constant in those countries while wheat production in Argentina went down by nearly half during the same period.

Figure 17 - Commodity Production, Brazil/Paraguay/Canada/US, 1980-2013



(IHS Global Insight, 2014)

Another influence on farmer's crop decisions in addition to domestic policies has been technology advances. The major technological change driving much of the expansion of soybean production was the introduction of Genetically Modified (GM) seed by Monsanto. GM soybean seeds that were resistant to weed treatments (like Monsanto's glyphosate, trade name Roundup) proved to be hugely popular among producers. Monsanto marketed the GM seed with the name "Roundup Ready". Notably, because of the popularity of this technology for Argentine producers, Argentina has consistently ranked second in the world (after the United States) in terms of area planted with GM crops (Lence, 2010, p. 428).

The adoption of GM seeds has contributed to the expansion of agricultural production in Argentina in several ways. First, GM seed allowed the farmer to apply weed treatments when they are most effective at weed control and to adopt cost saving techniques like zero tillage. Zero tillage, or no-till, consists of planting crops in soil without previous tillage, by opening only a slot in the soil with the smallest dimensions to get the seed planted. Zero tillage eliminates the need to till the soil and perform other types of work associated with conventional crop production technologies. Second, zero tillage allows poorer, less productive, land to come into production, contributing to the expansion of the crop frontier. Third, zero tillage reduces the deterioration of land caused by tillage. This has permitted the conversion of some areas that were on rotation between pasture and crop to permanent (monoculture) agriculture. With the traditional tillage techniques used for weed control, pasture rotations were required in order to maintain the fertility of the land (Lence, 2010, p. 429).

The desirable attributes of GM seed coupled with domestic agricultural and trade policies that penalized farmers for producing almost any crop other than soybeans have contributed to the focus on soy production in Argentina. From a nonexistent product in 1970 to today, Argentina has become the third largest producer of soybeans in the world, with 19.3% of the global supply.

As shown in Table 18, between 2005 and 2011, Argentina produced 8.4% of world agricultural output and accounted for 2.9% of world agricultural trade. This makes Argentina the eighth-largest producer and the twelfth largest exporter of agricultural commodities in the world. However, what would explain the difference between the amount of production and the export ratio? Why would Argentina have such a much smaller share of world exports (2.9%) compared to its share of world output (8.4%)? This is because Argentina tends to export



commodities with relatively low value-added qualities. Argentina exports basic commodities like soybeans and associated products, soybean oil and soybean meal. Argentina is the top exporter of soybean oil and soybean meal, with 46.9% and 36.1% of the world's export market, and the third-largest exporter of soybeans. For all three commodities, Argentina ranks third among all producers, with almost one-fifth of world output. The result is that Argentina has become overly dependent on a single commodity with low value added processes. This may become a serious issue when commodity prices moderate in the international markets or when the production gains from soybeans moderate.

Table 18 - Argentina's production and exports of selected ag commodities, avg. 2005-2011

	<b>Production</b>		<b>Exports</b>	
	World Share (%)	World Ranking	World Share (%)	World Ranking
Total agricultural Products	8.4	8	2.9	12
Crops:				
Soybeans	19.3	3	13.7	3
Soybean Meal	17.4	3	36.1	1
Soybean Oil	17.4	3	46.9	1
Wheat	2.4	13	6.7	7

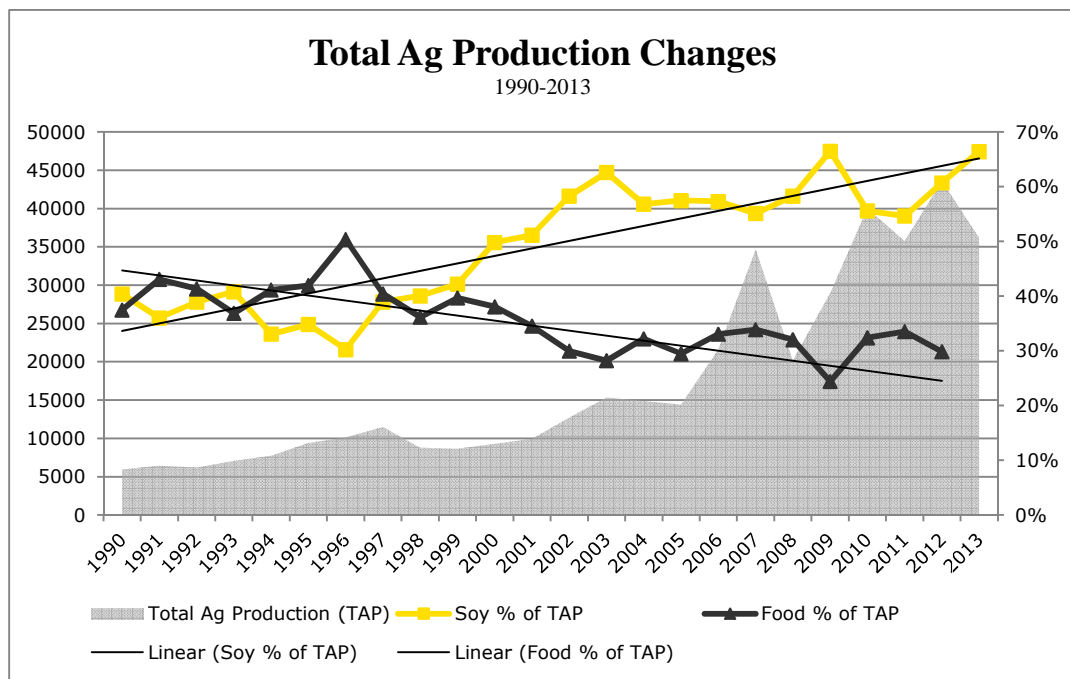
(Calculated from data at Food and Agriculture Organization of the United Nations, 2014)

The decade of the 2000s has been very favorable for Argentina's agricultural exports and has expanded tax revenues for the state. Ultimately, high international commodity prices have allowed the Argentine government to avoid increases in domestic commodity prices. Dependence on this rising agricultural market has led the government to apply ever higher export taxes. The need to protect the domestic market in order to keep prices low led to export restrictions or export bans on certain commodity exports. This policy was intended to keep the domestic supply large enough that prices would remain low. For wheat and corn, the government implemented a complex compensation scheme to allow domestic users to buy at more favorable prices than exporters (Lence, 2010, p. 423). As for soybeans and soy products, although the government taxed the exports (as high as 37.5% in 2007), since the products are

barely consumed by the Argentine domestic market, the government did not restrict their export. Instead, high international market prices have allowed the government to extract the tax while production continued to expand due to improved efficiencies and the incentives that pushed farmers to move away from producing other commodities.

There are serious potential consequences with the direction of Argentine agriculture. Another view of the changes taking place in the agricultural industry is to compare Total Agricultural Production (TAP) changes over time. The chart below shows the TAP (Gray area) along with the contributions of soy and food products over time. The black triangles show the percentage of food production and the yellow line is the soy contribution. The linear trend lines clearly indicate the move away from food production in Argentina.

Figure 19 - Argentina Agricultural Production Changes, 1990-2013

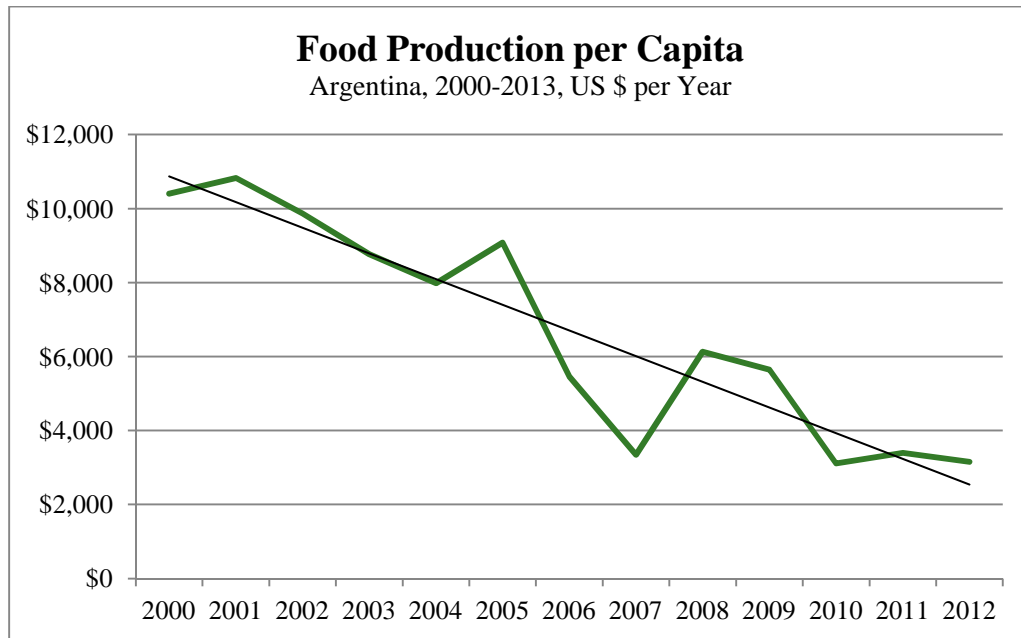


(Calculated from World Bank Data, 2014)

Another method for reviewing the data is to compare the production figures on a per capita basis. The chart below shows the change in food production in comparison to the

population in Argentina. The per capita food production in Argentina has clearly diminished over the last two decades, with the trend line for the data showing a steep decline.

Figure 20 - Argentina Per Capita Food Production, Argentina, 2000-2012



(John Deere EMR, 2014)

There are also potential environmental impacts created by the changing crop production practices and the move toward more soybean production. The focus on soybean production has led to monocropping. This is where the farmer plants soybean year over year on the same acreage. According to Pengue, large scale mechanized GM soy monocropping in the Pampas has resulted in nutrient depletion and soil structure degradation. There is also the potential for significant environmental impact due to large scale soybean monocropping. As monocrops expand into frontier areas, natural habitats disappear, thus endangering plant and animal biodiversity (Pengue, 2009).

Wheat production clearly demonstrates the impact of export taxes and export quotas coupled with import substitution policies. For the past several years, Argentine farmers have been dealing with the government imposed commodity export limits and taxes, which the

government says are to protect domestic supply. As a consequence, wheat producers have become discouraged as the government has attempted to control the wheat market in order to keep the domestic market well supplied and prices low. This has given farmers little incentive to produce wheat and so they have slashed the land sown with wheat in 2014 to the lowest level since 1903, when pioneers were still expanding the frontier. Even since 1990, wheat production has decreased from \$24,942 per capita to \$13,032 in 2012, a reduction of almost half. If weather does not cooperate, one of the world's natural breadbaskets may not produce enough wheat next year to meet domestic demand. If it falls short of wheat, it would be only the second time since the 1870s that Argentine farmers could not supply enough wheat for their own market. Argentina could realistically supply three times the domestic requirements and yet still produce the same amount (or more) in soybeans as today. The Pampas should be a breadbasket for the Argentine nation and the world. (The Economist, 2013)

A quantitative review of the data confirms the correlation between the level of export taxation and the level of wheat production. Pearson's  $r$  is a measure of the linear correlation (dependence) between a set of two variables. The correlation analysis results in a range of values between 1 and negative 1. A value of 1 is a total positive correlation, 0 is no correlation, and -1 is a total negative correlation. Using Pearson's correlation to measure the linear correlation between the level of export taxation and the crop production values for wheat, corn, and soybeans, we find that the production level of wheat is directly correlated to the level of export tax imposed by the government. The correlation is significant at the .005 level with a relationship of -.374.

Figure 21 – Export Tax Correlation to Food Production & Investment

Variable	Export Tax	Capital Investment per Capita	GDP Capita	Food Production Per Capita
Export Tax	1	-0.036	-0.207	-.391*
Capital Investment per Capita	-0.036	1	.565**	-.522**
GDP Capita	-0.207	.565**	1	-.526**
Food Production Per Capita	-.391*	-.522**	-.526**	1
*. Correlation is significant at the 0.05 level (2-tailed).				
**. Correlation is significant at the 0.01 level (2-tailed).				

Another noteworthy find in the quantitative data is the significant correlation between the level of export taxation and the level of food production per capita produced by Argentine farmers. The correlation is significant at the .05 level with a value of -.391. This quantitative analysis shows a direct correlation between the policies pursued by the Argentine government and possible impacts on Argentine agriculture. This suggests that governmental policies have caused skewed incentives that have affected the ability of the nation to feed itself with the domestic production of corn, wheat, rice, or barley.

## **CHAPTER 5 – DISCUSSION AND CONCLUSIONS**

### **Discussion**

Argentina is a country richly endowed with natural resources appropriate for agricultural production. Such resources have allowed it to be a major player in international commodity markets for more than a century. The experience with liberalized trading policies in the 1990s, when discrimination against agriculture was at an historic low level, suggests that the sector is extremely responsive to economic incentives. The economic debacle experienced by Argentina at the end of 2001 marked a policy reversal and a shift toward more aggressive and extractionary policies that have adversely affected the agriculture sector. The country's need to obtain hard currency and improve fiscal revenues drove the policy changes and has allowed the government to continue to pursue populist policies.

I have suggested that Argentine agricultural output should have been impacted by the extractionary policies implemented to support the funding of populist programs. Although agricultural productivity has continued to rise, the government's policies have had detrimental effects on the mix of agricultural commodities, causing producers to favor growing soybeans over other crops. It is clear that the mix of commodities has changed drastically over the past twelve years. It is also clear that there is a correlation between taxation and export control levels with the level of food production in Argentina.

It is not as clear in the data that agricultural investment has changed directly due to the impact of export taxes and controls. The data indicates that the government's agricultural policies have had no significant impact on agricultural investment. Intuitively however, we know that higher taxation and controls on exports negatively affect farm revenue. Since producers rely on the healthier margins to continue making necessary investments, long term investment must be lower. However, the impact is not evident in the data analyzed. It may be

that the higher import taxes, export taxes, and export controls have caused agricultural investment to focus on the commodity where we do see major shifts in production. The available investment capital may be focused on soybean production. This lower investment may account for Argentine producers changing their cropping practices due the efficiency and profitability available with soybean production.

During the period when I have been researching for this work, I've had the opportunity to visit with people directly tied to the Argentine agricultural industry while in the country. There are surprising parallels between farmers in Argentina and those in other advanced agricultural producer nations. Many of the advanced techniques used by farmers in Argentina are the same or similar to those of farmers in the mid-west of the United States. The sophistication of modern farming operations and the level of technology required have led to a consolidation of farming in both Argentina and the United States. Today, there are fewer, but larger, farms in the mid-west. This has also been the case in Argentina. The number of farms and farmers has shrunk as farm scale expands and the control of farming shifts to agribusiness. During my visits to Argentina, I had the opportunity to discuss the agricultural industry with John Deere employees and dealers as well as with two customers that are typical in the industry.

The first customer was Francisco (Pancho) Garcia Mansillo. Pancho farms 1560 hectares (3,744 acres) in the Cordoba Province. His family has been farming this area of Argentina since 1840. Pancho has been managing the farm since 1986 when he took over the operation from his father. Pancho has nine children.

As recently as 2000, the Garcia operation was almost exclusively corn and wheat production. By 2012, Pancho had converted 50% of his acreage to no-till, GM soybean production. Another 30% is used for maize production. Until recently, 20-25% of the farm

would be dedicated to wheat as a rotational crop. Today, however, wheat is less attractive to Pancho's operation and he is converting more of this area to sunflower and peanut production. The reason for these cropping decisions is "sadly" (Pancho's word) government policies that restrict exports and control the price that Pancho can get for his production. The policies have led farmers to grow more soybeans to stay profitable even though experienced farmers like Pancho know that crop rotation is essential to keeping soils healthy. "You grow other crops to rotate and protect the soil," says Pancho Garcia, "but it means you take a loss on those crops."

The second customer I met is a father and son in Los Quirquinchos. Roberto (father) and Lucas (son) Albanesi have a farming operation that serves as a custom service provider to other farmers in their area. The Albanesi's manage to farm 700 hectares (1680 acres), exclusively in soybeans. More than 50% of their time is spent providing custom services (seeding, spraying, harvesting) to other producers on a contract basis. According to Roberto, soybeans have been the crucial crop that has allowed their entire region to survive as other crops have become less profitable. The region has benefited from the increased soybean yield from GM seeds and from the application of technology. Good prices for soy products have kept production high and income levels sufficient. Even with the tax rates as high as 30%, precision, no-till planting coupled with efficient machinery have allowed their customer's operations to remain profitable. Roberto expressed serious concern that the prices for soybeans needed to remain high. Without high prices for soybeans and with the difficulty making any real profit with other crops due to government policies, the Albanesi operation along with many of their neighbors would suffer immensely.

According to both Pancho Garcia and Roberto Albanesi, soybean production is the choice over other crops or cattle due to two primary drivers. High international prices for soy



products and governmental programs that set quotas and tax rates that discourage exportation of other crops. Many farmers in addition to these two have made this same choice and it is reflected in the national data (See Figure 13). The Kirchner administration has indirectly fueled the expansion of soy production through policies that were supposed to promote wealth distribution and to secure food for domestic consumption. The government imposed price caps and export quotas on select products (wheat, milk, and meat in particular) in order to ensure food supply in the domestic market. The adverse impact of these policies is also demonstrated in the national data with the correlation between the export tax imposed by the government and the per capita wheat production. Government policies have pushed these producers toward soybean production. The unintended consequence of policies adopted to protect domestic food supply has been to actually produce food insecurity in Argentina. Argentina has nearly lost its food sovereignty; that is, its ability to feed its own population.

The trouble with agriculture in Argentina is the result of the government's blunders in economic policy. The blunders will continue to impede economic growth and will reduce government revenue at a time when its debt is overwhelming. Understanding how Argentina has gotten to this point is essential for suggesting how Argentina might turn around its sinking economy and perhaps achieve sustainable long-term growth. Growth will depend on Argentines electing a government that will implement policies that encourage individuals to work, promote entrepreneurship, boost individual savings, and reward investment. Crucial to this course correction will be tax rates that are not arbitrary or overly burdensome, coupled with a reliable and stable currency. Above all, Argentina needs a government and legal system that has a solid respect for private property rights.

## Conclusion

I have suggested that Argentine agricultural output should have been impacted by the extractionary policies implemented to support the funding of populist programs. Although agricultural productivity has continued to rise, the government's policies have had detrimental effects on the mix of agricultural commodities, causing producers to favor growing soybeans over other crops. It is clear that the mix of commodities has changed drastically over the past twelve years and due to this changing mix, Argentina will likely not be self-sufficient for food. It is clear that there is a correlation between taxation and export control levels with the level of food production in Argentina. It is not as clear in the data that agricultural investment has changed directly due to the impact of export taxes and controls.

The objective of this case study has been to analyze the impact of Argentine domestic agricultural policies on agricultural production and investment. This study comprises two separate but related analyses on changes to commodity production and infrastructure investment based on the impact of export taxes in Argentina. Based on my results, what one would expect to see as evidence of flawed policies is not evident in the macro data available for levels of agricultural investment. However, the results are suggestive and the implication is that long run policies that distort prices and investment decisions will hurt farmers and farm production in the end.

Obviously, without the current tax and quota structure, Argentine soybean farmers would be more competitive, more profitable, and better positioned to make investments for the future. The farmers are currently being penalized for selling soybeans, albeit less than the penalties for selling other commodities, so there must be some long-term economic rents. We see evidence that producers are adapting their crop systems in innovative ways that are both expeditious and less expensive to put in place. The growth in the use of grain bags for in-field

storage is a case in point. It is also clear that the domestic policies and export taxation have led to a significant consolidation of the agricultural productive capacity of Argentina toward soybean production. The long-term, detrimental impacts of this consolidation on the environment and on the health of the Argentina agricultural economy are as of yet unclear. This may require further investigation to determine where the impacts materialize.

It is clear that the growth of soybean production has had positive effects for Argentina. Soybean exports have kept currency flowing into Argentina and have kept the government solvent, at least for now. Soybeans have also contributed to the adoption of new technologies like no-till cropping and biotechnological innovations (GM seeds, fertilizers and herbicides) and the more intensive use of agricultural machinery.

Unfortunately, the consolidation to soy production has generated a heavy dependence on a single commodity with a serious lack of commercial diversification. This one product (soybean bean and its derived products) has come to represent 20-25% of the total exports of Argentina and has displaced the production of other products across the agricultural industry. I have focused this analysis on the impacts to agricultural investment and specific commodities. However, the domestic policies driving this dependence on soy products are also having detrimental effects on other agricultural products as well. Argentina was once the world leader in beef exports. Argentina's ranchers and farmers produced more than 3.1 million tons of beef, exporting some 745,000 metric tons to the world market. Argentina was the third largest beef exporting country (behind Brazil and Australia) in the world in 2005. Unfortunately for the beef industry, in March 2006 the Argentine government banned beef exports for 180 days in an effort to lower the domestic price of beef. The government followed that up by imposing a 15% tax on beef exports. The result of this misguided policy was an immediate drop in exports and

the domestic beef prices. Unfortunately (again), the Kirchner government assumed ranchers and farmers would continue to raise cheap beef for the domestic market. Instead, they cut their herds and converted their pastures to soybean production, which was more profitable than raising cattle for the artificially depressed beef market. The US Department of Agriculture reports that in 2012 Argentina exported only 164,000 metric tons of beef (11<sup>th</sup> place globally).

Finally, the role the state and domestic policies in Argentina have played in relation to the agricultural production must be understood. Increased social spending and infrastructure investment certainly improve people's well-being, in particular that of the poorest. The apparent success of GM soy has helped legitimize the Kirchner model for redistribution. The immense expansion of soybean production and the appropriation of a large portion of the profits to the benefit of many rather than the few reinforce the idea that the populist model is an appropriate method for redistribution. However, the potential of populism in Argentina to fully address social problems is questionable. Since the funding for the government's social programs relies so heavily on soybean production and exports, any disruption in the price or demand for soy products is likely to have significant impacts on the government's ability to fund its programs. In the medium term, this is a highly unstable economic model that is subject to cycles of boom and bust. Soy production in Argentina is driven by constantly expanding international demand (China and India), which has caused prices to go up and has absorbed increasing production. As with any cycle of boom and bust, however, the question is not if demand will ever slow down, but rather when it will happen, and how hard it will hit.

As of this writing, the outcome for Argentina's agricultural industry is unclear. The international commodity price for soybeans has already fallen to half the price in 2011. The future state of the Argentine economy will depend on how political forces shape up in the near

future. The outcome of the politics deciding the future direction of the Argentine government after the current administration will have critical implications for the future performance of Argentinean agriculture. The sector tended to languish when policies were highly discriminatory against it. However, the producers within this economic sector are resilient and the industry should quickly prosper under a more favorable political-economic environment.

## BIBLIOGRAPHY(n.d.).

Argentina: Down to earth. (1999, May 13). *The Economist*, p. <http://www.economist.com/node/321776>.

Killing the pampas's golden calf; Argentina's taxes on food exports . (2008). *The Economist*.

Para el Banco Central, los ahorristas motorizaron una fuga de capitales récord. (2011, December 1). *LA NACION*.

(2012, April 21). Retrieved from Index Mundi:

<http://www.indexmundi.com/commodities/?commodity=soybeans&months=120>

*Global Trade Alert*. (2012, April). Retrieved April 25, 2012, from Global Trade Alert:

<http://www.globaltradealert.org/>

The Americas: Parched Earth, Empty Barns; Argentina's Farming in Crisis. (2013, April 30). *The Economist*.

*Food and Agriculture Organization of the United Nations*. (2014). Retrieved November 25, 2014, from FAO Statistical Database:

<http://faostat.fao.org/site/567/DesktopDefault.aspx?PageID=567#ancor>

*The World Bank Data*. (2014, April 23). Retrieved March 23, 2014, from The World Bank Database:

<http://data.worldbank.org/country/argentina>

The Americas: The Kirchners v the Farmers; Argentina. (30 Sep 2013). *The Economist*, 66.

Farming without Fields. (4 January 2014). *The Economist*, 51.

5M Publishing. (2012, April 30). *The Crop Site*. Retrieved April 30, 2012, from

<http://www.thecropsite.com/reports/?country=AR&id=264>

Acemoglu, D., & Robinson, J. (2012). *Why Nations Fail: The Origins of Power, Prosperity, and Poverty*. New York: Random House.

Barbieri, P. (2012, April 19). The Tragedy of Argentina. *Wall Street Journal*, p. A13 (Opinion).

Binder, A. S. (2014, May 15). *Keynesian Economics*. Retrieved May 15, 2014, from Library of Economics and Liberty: <http://www.econlib.org/library/Enc/KeynesianEconomics.html>

Brambilla, I., Galiani, S., & Porto, G. (June 2009). Argentine Trade Policies in the XX Century: 60 Years of Solitude. 1-51.

Bresser-Pereira, L. C. (2012, April 23). *Argentina is right* . Retrieved May 15, 2014, from nakedkeynesianism.blogspot.com: <http://nakedkeynesianism.blogspot.com/2012/04/argentina-is-right.html>

Cardoso, F. H. (1979). *Dependency and Development in Latin America*. Berkeley: University of California Press.

- Centeno, M. A. (2002). *War and the Nation-State in Latin America*. University Park : Pennsylvania State University Press.
- Collier, P. (2007). *The Bottom Billion: Why the Poorest Countries are Failing and What can be done about it*. New York: Oxford University Press.
- De Janvry, A., Key, N., & Sadoulet, E. (1997). Agriculture and Rural development policy in Latin America: New directions and New Challenges. *FAO Agricultural Policy and Economic Development Series-2*.
- Fairfield, T. (2011). Business Power and Protest: Argentina's Agricultural Producers Protest in Comparative Context. *Springer Science+Business Media*, 424-453.
- Fletschner, D. K., & Zepeda, L. (2002). Efficiency of Small Landholders in Eastern Paraguay. *Journal of Agricultural and Resource Economics*, v. 27, iss. 2, 554-572.
- Fulginiti & Perrin, R. K. (1993). Prices and productivity in agriculture. *Review of Economics and Statistics*, 75, 471-482.
- Fulginiti, L., & Perrin, R. L. (1997). LDC Agriculture: Non-Parametric Malmquist Productivity Indexes. *Journal of Development Economics* 58, 373-390.
- Gallo, A. (2012). Trade Policy and Protectionism in Argentina. *Institute of Economic Affairs*, 55-59.
- Goggle Images. (2014, May 13). *Google*. Retrieved from Google Images:  
[https://www.google.com/search?q=pampas+region+of+argentina&biw=1280&bih=894&tbm=isch&imgil=0i2\\_ZFeSEbwqZM%253A%253Bhttps%253A%252F%252Fencrypted-tbn3.gstatic.com%252Fimages%253Fq%253Dtbn%253AANd9GcSlbrV4F8er1GiJqLwKiwyo67\\_C57ryoBxcIjc4oypDb2PPcAl0HQ%253B3](https://www.google.com/search?q=pampas+region+of+argentina&biw=1280&bih=894&tbm=isch&imgil=0i2_ZFeSEbwqZM%253A%253Bhttps%253A%252F%252Fencrypted-tbn3.gstatic.com%252Fimages%253Fq%253Dtbn%253AANd9GcSlbrV4F8er1GiJqLwKiwyo67_C57ryoBxcIjc4oypDb2PPcAl0HQ%253B3)
- Grief, A. (1993). Contract Enforceability and Economic Institutions in Early Trade: The Maghribi Traders' Coalition. *American Economic Review* 83, 525-548.
- Ground, R. L. (2011). *World Economy Political Economy of Development*. Lawrence: Class Presentation and notes.
- Helfand, S. M., & de Rezende, G. C. (2002). The Impact of Sector-Specific and Economy-Wide Policy Reforms on the Agricultural Sector in Brazil: 1980-98. *Contemporary Economic Policy*, v. 22, iss. 2, 194-212.
- Helpman, E. (2004). *The Mystery of Economic Growth (Kindle Ed.)*. Cambridge Massachusetts: Harvard University Press.
- Hudson, R., & Meditz, S. W. (1992). Uruguay: a country study. *Federal Research Division, Library of Congress*, .
- IHS Global Insight. (2014). *Data Edge*. Washington, DC: US Department of Agriculture.

- John Deere EMR. (2014). *Argentina Value of Production for Key Crops*. Moline: John Deere Enterprise Market Research.
- Leguizamón, A. (2013). Modifying Argentina: GM Soy and socio-environmental change. *Elsevier Geoforum*, 149-160.
- Lence, S. (2010). The Agricultural Sector in Argentina: Major Trends and Recent Developments. *The Shifting Patterns of Agricultural Production and Productivity Worldwide*, Chapter 14, pp. 410-440.
- Lerner, A. P. (1936). "The Symmetry Between Import and Export Taxes". *Economica, New Series*, Vol. 3, No. 11, pp. 306-313.
- Michels, R. (1962). *Political Parties: A Sociological Study of the Oligarchical Tendencies of Modern Democracy*. New York: Crowell-Collier Publishing Company.
- Miller, T. (2011). *2011 Index of Economic Freedom*. Retrieved April 25, 2012, from The Heritage Foundation: <http://www.heritage.org/index>
- Ministry of Agriculture, Livestock and Fisheries of Argentina. (2013). *Comparative study of genetically modified and conventional soybean cultivation in Argentina, Brazil, Paraguay, and Uruguay*. San Jose: Inter-American Institute for Cooperation on Agriculture.
- Nogués, J. J. (2011). *Agricultural Export Barriers and Domestic Prices: Argentina during the last Decade*. Rome: Food and Agriculture Organization.
- O'Grady, M. (2012, January 9). Argentina's Capital Flight. *Wall Street Journal*, p. Opinion.
- Pengue, W. A. (2009). *GM Soya Disaster in Latin America*. Retrieved August 15, 2014, from GMWatch: <http://www.i-sis.org.uk/SDILA.php>
- Prasad, B. C. (2003). Institutional Economics and Economic Development: The theory of property rights, economic development, good governance, and the environment. *Emerald Insight*, 741-760.
- Quispe-Agnoli, M., & Kay, S. (2013, January). *Argentina: The End of Convertibility*. Retrieved February 2013, from Federal Reserve Bank of Atlanta: [https://www.frbatlanta.org/pubs/econsouth/econsouth-vol\\_4\\_no\\_1-argentinaend\\_of\\_convertibility.cfm](https://www.frbatlanta.org/pubs/econsouth/econsouth-vol_4_no_1-argentinaend_of_convertibility.cfm)
- Rakotoarisoa, M. A. (2010). The Impact of Ag Policy Distortions on the Productivity Gap: Evidence from Rice. *Elsevier, Food and Agriculture Organization of the United Nations*.
- Reeder, W. D. (2007). *Export Taxes on Agricultural Products: Soybean Export Taxes in Argentina*. Washington, DC: US International Trade Commission.
- Richardson, N. P. (2009). Export-Oriented Populism: Commodities and Coalitions in Argentina. *Springer Science and Business Media (Springerlink.com)*, 228-255.



- Richardson, N. P. (2012). *Export Agriculture and Redistributive Conflict in South America*. Berkeley: University of California.
- Romig, S. (2014). Argentina February Inflation Rate Rises 3.4%. *The Wall Street Journal*, March 17, 2014.
- Schnepf, R. D., Dohleman, E., & Bolling, C. (2001). *Agriculture in Brazil and Argentina: Developments and Prospects for Major Field Crops*. Washington, DC: Economic Research Service / USDA.
- Stewart, B. (2011, July 18). *Argentina: Cristina Ramps Up Protectionism*. Retrieved April 25, 2012, from The Foundry: <http://blog.heritage.org/2011/07/18/argentina-cristina-ramps-up-protectionism/>
- Stewart, B. (2011, July 18). Argentina: Cristina Ramps Up Protectionism.
- Stewart, B. (2011, July 18). *Cristina Ramps Up Protectionism*. Retrieved April 2012, from Heritage Foundation Blog: <http://blog.heritage.org/2011/07/18/argentina-cristina-ramps-up-protectionism/>
- The Economist. (1999, May 13). Argentina: Down to earth. *The Economist*, p. <http://www.economist.com/node/321776>.
- The Economist. (2013, April 30). The Americas: Parched Earth, Empty Barns; Argentina's Farming in Crisis. *The Economist*.
- The Economist. (30 Sep 2013). The Americas: The Kirchners v the Farmers; Argentina. *The Economist*, 66.
- USDA, ERS. (n.d.). Retrieved November 25, 2014, from United States Department of Agriculture, Economic Research Service: <http://www.ers.usda.gov/data-products/wheat-data.aspx#25340>