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DOLLARIZATION IN LATIN AMERICA
THE CASES OF ARGENTINA, CHILE, ECUADOR, PERU, AND URUGUAY

ROBERT B. DEWEY
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Reviewed and approved* by the following:

Dr. Saroj Bhattarai
Assistant Professor of Economics
Thesis Supervisor

Dr. James Tybout
Professor of Economics
Honors Adviser

* Signatures are on file at the Schreyer Honors College.

ABSTRACT

This paper analyzes the phenomenon of dollarization and de-dollarization that has taken place in the following Latin American countries from 2000-2011: Argentina, Chile, Ecuador, Peru, Uruguay, and determines if this phenomenon is correlated with any other levels of economic performance. The analysis gives a brief history of dollarization policies in each country, discusses the level of dollarization and policies to combat dollarization since 2000 in each of the countries, and examines the relationship between dollarization and inflation. After an overview of each of the countries, we highlight some common trends across all of the country cases and examine why this is the case. We then draw the conclusions that inflation and the level of dollarization are positively correlated, and that countries have the ability to take an active role in controlling or reducing the level of dollarization within their country.

TABLE OF CONTENTS

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Finally, I would like to recognize the students in ECON 489M. Their mutual support, knowledge, and commitment to learning have motivated me to remain diligent in my study of dollarization and its affect in Latin America.

INTRODUCTION

Latin America has a significant history of dollarization. In fact, 27 of Latin America's 32 countries have experienced levels of dollarization above 10% of total deposits since 1990 (Honohan, & Ize, & Nicoló, 2003). Dollarization has been especially prevalent in Argentina, Chile, Ecuador, Peru, and Uruguay. This paper will introduce us to the phenomenon of dollarization, the risks and advantages of dollarization, and trends in dollarization across countries. It will then go on to determine the most relevant variables that are correlated with changes in dollarization. Finally it will help to evaluate the effectiveness of dollarization reduction initiatives that have been implemented in Latin America throughout the past century.

DEFINITION OF DOLLARIZATION

I. **Measuring Dollarization**

There are many different ways to define dollarization, for the purpose of this analysis we will define dollarization as domestic deposits denominated in non-local currency divided by total domestic deposits. This method of measuring dollarization is the most straightforward and allows for the broadest measure of dollarization. It measures the cumulative dollarization of deposits regardless of the amount deposited.

Another method of measuring dollarization is to measure the amount of dollars going into a country as Kamin and Ericsson did in their 1993 study (Kamin & Ericsson, 1993). The benefits of measuring dollarization in this manner is that you can "estimate the stock of U.S. currency circulating in Argentina [and other Latin American Countries], based upon recorded flows of U.S. currency between Argentina and the United States." (Kamin & Ericsson, 1993)

The U.S. Customs and Border Protection collects data which it then forwards to the U.S. Treasury Department via reports called *Currency and Monetary Instrument Reports* (CRIMs). These reports must be filled out by any individual or entity transporting $10,000 or more into or out of the United States. The benefit of measuring dollarization in this way is that you are able to account for some of the money that is kept out of banks. This is because many of the dollar inflows into a country are done by either large corporations or large banks and thus would be recorded by the CRIM data.

In many South American countries (especially in Argentina and Uruguay), citizens are worried of recurring bank or currency crisis such as the ones that occurred at the beginning of the decade. With this in mind, many Latin Americans keep U.S. dollars in their homes and out of the banking system (Faiola, 2002). They do this so that they will have access to their money at any time and won't have to worry about the banks withholding their deposits as they did at the beginning of the century. The amount that Argentines hold in U.S. dollars varies, but ranges from a few hundred dollars to several thousand. Measuring the inflow of dollars into the country would help to account for these out-of-bank stocks of U.S. dollars. In addition, this measure of the dollars outflows from the U.S. to other countries helps to account for black market interactions that other methods wouldn't be able to account for.

While there are several benefits of this type of measure, there are also some major short falls in that it neglects to measure off-shore accounts and money that leaves the country of destination. Many wealthy Argentines invest their money in more secure banks outside of the country in such places as the Cayman Islands or Switzerland. Also, many spend their U.S. dollars outside of their home country, and this measure has no way of recording such outflows of

U.S. currency. Another major short fall of this method is that it only records transfers of greater than $10,000 U.S. Dollars, meaning that smaller transfers are not recorded. This means that there are a multitude of smaller transactions being ignored from the dollarization calculation.

There are other options to measure dollarization as well. These other options include examining real balance of domestic currency as compared with the real balance of foreign currency, determining the deposits of foreign currency as percentage of total liquidity, and determining the level of U.S. denominated lending compared to domestic denominated currency lending. These other measures tend to be less accurate as there is less precision in the collection and measurement of this type of data. Imprecision is due to the uncertainty surrounding the amount of currency in circulation and the level of liquidity as compared with the level of deposits in domestic versus non-domestic currency.

II. Levels of Dollarization

With measuring techniques in mind, we would be remiss not to mention the many different levels of dollarization. There is the case of full dollarization, which is when a country eliminates their domestic currency and completely adopts the U.S. dollar. A country with this level of dollarization is Ecuador which we will examine later on. In Ecuador, there is no domestic currency; instead Ecuadorians use U.S. dollars for street level purchases, at the store, and for all official transactions.

A second level of dollarization is partial or semi dollarization which is when the government recognizes both a domestic currency and a foreign currency. An example of a partial or semi dollarized country is Bermuda.

Finally there is the case of unofficial dollarization or instances where the dollar is widely

used for private transactions, but isn't legal tender. Another way to think about unofficial dollarization is when the government doesn't approve of dollarization or doesn't endorse dollarization, but the citizens decide to convert their assets to a foreign currency anyway. Much of Latin America faces unofficial dollarization including Argentina, Chile, Uruguay, and Peru. Unofficial dollarization is often subject to huge fluctuations in the amount dollarized and is largely related to levels of inflation and consumer confidence. These fluctuations are also referred to as flight-to-capital, or domestic investors taking money away from risky domestic assets and instead converting them into foreign money assets with a stronger track record of stability and little to no risk of default or extreme inflation. In addition to capital flight, unofficial dollarization can be influenced by the government through currency controls and economic policies. The government can set a limit on the amount of money which citizens or corporations are allowed to convert to dollars at a certain time. While this does have the affect of temporarily limiting the amount of domestic money being converted to a foreign currency, it also is an indication that there is something unstable about the domestic currency and that the domestic currency may be unsustainable in the long run.

III.   Costs and Benefits of Dollarization

There are many differing opinions on the effectiveness or appropriateness of dollarization, but a few things are clear- dollarization has both benefits and costs. Among other things, the benefits of dollarization include the elimination of exchange rate risk, having a nominal anchor, and avoiding wealth volatility. The costs of dollarization include a loss of revenue due to loss of seigniorage and countries losing their monetary policy autonomy. Dollarization is the most extreme form of a fixed exchange rate; therefore the effects of full dollarization are equivalent to the effects of a fixed exchange rate except in the case of

seigniorage, which only affects countries which have dollarized.

The elimination of exchange rate risk is a huge benefit of dollarization. Eliminating exchange rate volatility makes trade and cross-border investment easier to occur.   This is because investors and corporations don't have to worry about hedging exchange rate risk. With exchange rate risk eliminated, it is also more likely that purchasing power parity will hold and that trade will increase with the currency peg country. In fact, using data from 1973-1999, Shambaugh and Klein show that trade expands by 21 percent between countries that have dollarized or that have a fixed exchange rate (Klein & Shambaugh, 2004).

In addition to eliminating exchange rate risk, dollarization can be an effective tool to eliminate monetary shocks. This is because the monetary policy that must be followed by the country adopting the dollar will be the same as the monetary policy followed by the country the money is issued in. In other words, if the country that issues the money experiences a monetary shock and responds accordingly, the adopting country will also face the same monetary policy changes as home. Reducing the amount of control that the adopting country has in terms of monetary shocks. This also would likely decrease inflation in the adopting country as the country would be "importing" the monetary policy of the United States and thus importing a policy of low inflation. The subsequent decrease in inflation is likely to cause faster growth in the adopting economy as investors are less worried about devaluation risk and more apt to invest in the economy.

The third benefit of dollarization is the avoidance of wealth volatility. Wealth is measured by:

$$W = A - L$$

Where *W* stands for wealth, *A* stands for assets, and *L* stands for liabilities. Dollarization will result in both *A and L* having equal movements. This avoids the issue of wealth volatility which occurs when, you can have assets denominated in pesos and liabilities denominated in U.S. dollars. If the exchange rate of pesos to dollars increases, wealth would decrease. With dollarization, wealth remains unchanged as the exchange rate is constant. This results in wealth being more stable and more dependent upon the return of the asset, not on economic and exchange uncertainty. An additional benefit of dollarization, especially for less stable countries, is that dollarization requires budget discipline in the sense that countries are not able to print money to fund government spending. This is likely to force governments to examine policies and do more diligence in planning and implementing programs and policies.

The costs of dollarization are also substantial. Perhaps the most prominent cost is that home experiences a loss of use of monetary policy to stabilize the economy and more volatility due to demand shocks. When faced with economic uncertainty, countries have the option of affecting fiscal policy (government spending or taxes) or the monetary policy (the money supply). In the case of a fully dollarized economy, a country doesn't have the option to affect monetary policy. Instead, they must use the money supply to control the currency peg. This means that their only tool to affect economic uncertainty comes through fiscal policy. This can be very troublesome for nations as changes in government spending, and especially in the tax rate, can have very negative political implications. Additionally, this means that countries are faced with increased volatility from demand shocks. This is because any change in demand will cause the IS curve to shift and in order to maintain the fixed interest rate, the LM curve will have

to shift accordingly.   This results in huge fluctuations in home's Y. Without dollarization, the level IS curve could shift and the LM curve could either remain constant or be adjusted through monetary policy in order to lessen the affect of a fluctuation in demand. With a fully dollarized economy, there is no way to minimize such a shock in demand.

A second cost of full dollarization is that you are stuck with the issuing country's monetary policy. This means that the economic policy that the base currency is implementing will be felt in your country. We previously listed this as a benefit because it can sometimes help to reduce monetary shocks. This isn't always a benefit however, sometimes it is a cost. The reason that this is a cost is because the monetary policy appropriate for the issuing country isn't always appropriate for the adopting country. For example, in the late 1990s, Argentina was facing a recession and their economy was slowing down. Inversely, the United States was facing an overheating economy due to the dot.com boom. The United States enacted the appropriate monetary policy of decreasing the monetary supply in order to raise the interest rate and thus appreciate the dollar. While this policy worked well to slow down the U.S. economy, it also made the recession that Argentina was facing become worse. In this instance, loss of monetary policy eliminated the huge monetary policy shocks that the economy could have encountered but did not help the economy of Argentina. This shows an example of how monetary policy can be a cost.

A third cost that is unique to dollarization, which is not a problem for fixed exchange rates, is loss of seigniorage. "Seigniorage is the difference between the interest [earned by a central bank] on a portfolio of government securities-which is roughly equal in value to the total value of all bank notes in circulation-and the cost of issuing, distributing, and replacing those

notes." ("Seigniorage", 2010) Let us look at the example of a U.S. one hundred dollar bill. If the government invests the proceeds from issuing a $100 note, the note will indirectly yield income from interest revenue. You then must deduct the costs to produce the bill and account for the life cycle of the bill. According to the Fed, it costs about $.077 for every one hundred dollar bill that it produces and the average life of a hundred dollar bill is 17.9 years meaning that the average cost of production is equal to $.0043 per year ("How Much Does…", 2012). The rest of the revenue generated by interest revenue yields a positive return, or seigniorage. With dollarization, this potential interest income (seigniorage) is lost by the adopting country and gained by the currency issuing country.

As of 2000, the United States earned about $25 billion a year in seigniorage (Stein, 1999). While $25 billion isn't a whole lot for the U.S., for a country whose GDP is $370 billion ("Argentina,") that can be a significant source of government revenue. In fact it is estimated that Argentina can consistently generate approximately 7.5% of GDP through seigniorage (Neumeyer & Kiguel, 1989).

Another cost that is associated with dollarization is that emergency lending to banks is drastically reduced or cut off. Governments tend to print money in order to issue emergency loans to banks. With full dollarization, this would be impossible as the home country wouldn't be able to print U.S. dollars. Instead home would have to borrow money on international markets in order to bail out its domestic banks.

Keeping in mind the different ways to measure dollarization, the variations in level of dollarization, and the costs and benefits of dollarization, let us look at some examples of different levels of dollarization facing Latin America and the policies which have resulted in

these levels of dollarization.

THE DATA

I.　　Sources

The data that will be used for this analysis is quarterly data from 2000-2011. 2000 was chosen as the start date in order to compare the changes in dollarization levels and other variables since Ecuador dollarized in 2000. The dollarization data for Argentina is only available quarterly from 2003 onwards.

The data was obtained from the International Monetary Fund's International Financial Statistics, the website of the Argentine Central Bank, the website of the Chilean Central Bank, the website of the Ecuadorian Central Bank, the website of the Peruvian Central Bank, and the website of the Uruguayan Central Bank. According to the IMF website, The International Monetary Fund is the "principal statistical publication and is the standard source for all aspects of international and domestic finance." ("A step-by-step esds") The IFS data is a compilation of quarterly data from a variety of sources including "government departments, national accounts, central banks, the UN, Eurostat, the International Labour Organization and private financial institutions." The central banks websites are public data published by their respective countries and are considered the most accurate statistics available for each country.

II.　　Problems with data collection

It is important to remember that the IFS data is made up of some data from government agencies and that the central bank data is made-up exclusively of government data. Many Latin

9

American governments have been accused of skewing numbers to make themselves look more financially secure, be it to garner more investor confidence, more voter confidence in election years, or strictly for issues concerning their international reputation. This potential skewing of the data would cause both the IFS data and the central bank data to have similar inaccuracies. Additionally, there are significant variations in the way in which data is collected and calculated by the different central banks. These variations can be as minor as differences in rounding or as major as collecting data by surveys versus full reporting (Musigchai, 2007). This concern aside, IFS data and central-bank data are considered the most accurate amongst international data sets.

THE REGRESSION

In order to more fully interpret and assess the levels of dollarization, it is important to take into account other economic variables including inflation, exchange rate, imports, exports, and other measures. Many of these variables are correlated. In order to help avoid multicollinearity, this paper will focus on the correlation between inflation and dollarization. To determine the correlation between inflation and dollarization, we ran the following three regressions[1]:

$$\text{regression 1: } d_t = \alpha + \beta_1(\pi_t) + \varepsilon_t$$

$$\text{regression 2: } \Delta d_t = \alpha + \beta_1(\Delta\pi_t) + \varepsilon_t$$

$$\text{regression 3: } \Delta d_t = \alpha + \beta_1(\Delta\pi_t) + \beta_2(\Delta\pi_{t-1}) + \varepsilon_t$$

With "d_t" standing for level of dollarization at time t, "π_t" standing for inflation at time t, and "π_{t-1}" standing for inflation during the previous period (t-1). The results of these regressions

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[1] A fourth regression was done testing just the correlation of just the lag variable (*Regression: $\Delta d_t = \alpha + \beta_1(\Delta\pi_{t-1}) + \varepsilon_t$),* but there were no statistically significant results from this regression

are outlined in *charts 1.0-5.0* and will be discussed in their relative case studies.

The regression: $d_t = \alpha_t + \beta_1(\pi_t) + E_t$, will henceforth be known as regression one. This regression tests to see if there is a relationship between the level of dollarization with the level of inflation. The regression: $\Delta d_t = \alpha + \beta_1(\Delta\pi_t) + E_t$, will henceforth be known as regression two. This regression seeks to find a relationship between the change in dollarization compared with the change in inflation. Finally, the regression: $\Delta d_t = \alpha_t + \beta_1(\Delta\pi_t) + \beta_2(\Delta\pi_{t-1}) + E_t$, will henceforth be known as regression three. This regression aimed to establish a relationship between changes in inflation in the present period and changes in inflation in the previous period to changes in dollarization.

With this regression, there are some obvious concerns. The first of these concerns surrounds the possibility of a spurious relationship. A spurious relationship is a relationship in which two events or variables have no direct causal casual connect, yet it may be wrongly inferred that they do due to either coincidence or the presence of a certain third, unseen factor. This concern arises with our regression because of the similarities in what determines dollarization and what affects inflation. Included in the concern over a spurious relationship is the concern surrounding an omitted variable bias.

These regressions will focus exclusively on the relationship between dollarization and inflation and the changes in these two variables. There are several reasons to focus on inflation as a correlating factor of dollarization. The first reason is that the measure of inflation is calculated as changes in consumer price index. The information is available from the IMF and is complete for all countries. Many other variables or economic indicators are not complete across all five countries that we examine. The second reason to focus on inflation is to prevent multicollinearity; this regression has focused exclusively on inflation to help determine a causal

relationship with dollarization. A third possible problem is the problem of unit roots. Unit roots are a feature of a process that evolves over time that can cause problems in statistical inference if not adequately dealt with. Another note about unit roots is that shocks to a unit root process have permanent effects which do not decay as they would if the process were stationary. This means that shocks today have a residual effect and are felt in the future. The way to combat this issue is to take difference regressions rather than level regressions. That is to say, in regressions 2 and 3 we look at the change in inflation and the change in dollarization rather than the level of dollarization or inflation to help eliminate the problem of unit roots.

CASE STUDIES

I.   ARGENTINA CASE STUDY: 2000-2011

Argentina is a country with a long history of economic and political instability. This has been especially evident since 1983 when the most recent military dictatorship fell and Argentina returned to democratic rule. Since that time, the country has had several presidents including 5 different presidents in a two week stretch at the end of 2001 into early 2002 ("Presidents of Argentina."). Not only has there been turmoil within the presidency, there has been a lot of turmoil in the economy. Since 1983 Argentina has changed currency several times from the Peso Ley to the Peso Argentino in 1983, from the Peso Argentino to the Austral in 1985, and from the Austral to the Peso in 1992 ("A graphical review," 2011).   These currency changes were an attempt to create economic stability and put an end to periods of hyperinflation.   In addition to these changes in currency, Argentina has had several economic stability programs to try and end periods of hyperinflation and gain economic stability. This begs the question, to what extent would dollarization assist Argentina in stabilizing their economy? We will see in

examining the period from 2000-present that the level of dollarization has fluctuated drastically overtime as there have been flights-to-quality by investors in order to avoid losing money on investments in insecure Argentine assets. In other words, many Argentine's have exchanged monetary assets denominated in domestic currency for money assets denominated in more stable U.S. currency.

According to a 1995 Article by F.A.M. Balze, "Argentina's postwar economic decline does not represent the case of a backward country failing to identify a path toward economic development. Instead, Argentina's failure represents the less common case of a relatively modern economy and society pursuing the wrong economic strategy and therefore being unable to cope with a major change in its environment." (Balze, 1995). In the early 1980's, Argentina faced significant increases in public debt and faced closing international financial markets which resulted in a debt crisis. This crisis lead to fiscal deterioration in the public sector due to heavy debt-service payments, increased economic uncertainty, and capital flight (Balze, 1995). Also, in 1982, the Argentine tax system began to gradually lose the ability to collect taxes to keep pace with the rate of inflation. In 1983, as a result of these events, investments were restricted by the extremely high interest rates that investors were demanding. This resulted in gross investments decreasing from their 22.5 percent average between 1973 and 1983 to 16.7 percent between 1984 and 1990 (Balze, 1995). To combat this falling FDI, Argentina substantially increased international debt in order to sustain growth formerly driven by FDI which eventually led to the debt crisis.

Not only was Argentina facing a debt crisis, but the country was facing hyperinflation. Argentina enacted several different programs to try and combat this hyperinflation. In 1983,

Argentina converted its currency from the Peso Ley to the Peso Argentino. In 1985, Argentina

again converted its currency this time from the Peso Argentino to the Austral. 1985 also marked

the introduction of *Plan Austral*. This plan was one that allowed Argentina to take IMF funds in

return for wage, price, and exchange rate freezes with financial adjustments. This plan helped

decrease the fiscal deficit from 12% to 5%, but didn't fix inflation in the long run. With inflation

still unstable, Argentina introduced the *Plan Primavera* in 1988. This plan was an agreement

with private sector leaders to limit the growth of public prices, private prices, and the official

exchange rate to 4% per month. With all of these segments relatively under control, the real

exchange rate continued to appreciate. In August 1989, the Argentine Central Bank decided to

allow the exchange rate to float. This caused substantial depreciation of assets and savings, the

demand for Argentine Australs fell, and inflation skyrocketed. In December of 1989, facing

5000% inflation, the Argentine Central Bank forced the exchange rate for commercial

transactions to float. This caused even more depreciation, the money demand fell farther, and

inflation continued to increase.

In January of 1990, Argentina introduced the Plan BONEX. Plan BONEX froze

domestic deposits and converted public debt to 10-year U.S. dollar denominated bonds. With

this extreme economic uncertainty and clear need for definitive action, the country decided to

change its currency to the peso. It then proceeded to peg the peso to the U.S. dollar in a set-up

similar to a currency board. The government established the exchange rate at 1 to 1. 1 Peso

equaled 1 US Dollar. This was a fixed exchange rate and had all of the costs and benefits

identified earlier. This fixed exchange rate forced Argentina to be completely subjected to the

monetary policy of the Unites States of America.

Argentina's currency board lasted through 2001, although there were significant challenges that it faced while it was in place including the Tequilla Crisis, the Asian Debt Crisis, and the Brazilian crisis. In 2001 however, the challenges proved to be too strong for the Argentine Government to continue the currency board. The Peso was depreciating on international markets and speculators were driving down Argentine reserves of U.S. dollars by buying Pesos abroad and selling them within Argentina in order to make a significant profit. Towards the end of 2001, Argentina defaulted on its debt and abandoned the convertibility system. In a downward spiral, in December of 2001, Argentina introduced the *Corralito* which restricted bank deposit withdrawals to a maximum of $1000 U.S. dollars per month until March 3, 2002. In 2002, Argentina enacted a program called the *Pesification*. This program essentially converted $100 million in U.S. dollar denominated bank deposits into pesos. This created a huge demand for U.S. dollars as it showed extreme instability of the peso. As a result, the peso depreciated from a 1 to 1 exchange to a 4 to 1 exchange almost overnight.

The *Pesificaiton* and the *Corralito* had some pretty substantial and long lasting residual effects. If we look at *figure 1.0,* we can see that there have been major increases in the level of dollarization in Argentina. Let us examine the fluctuations in the levels of dollarization and come up with possible policies that have a strong correlation with the fluctuations.

Figure 1.0 – Level of Dollarization in Argentina
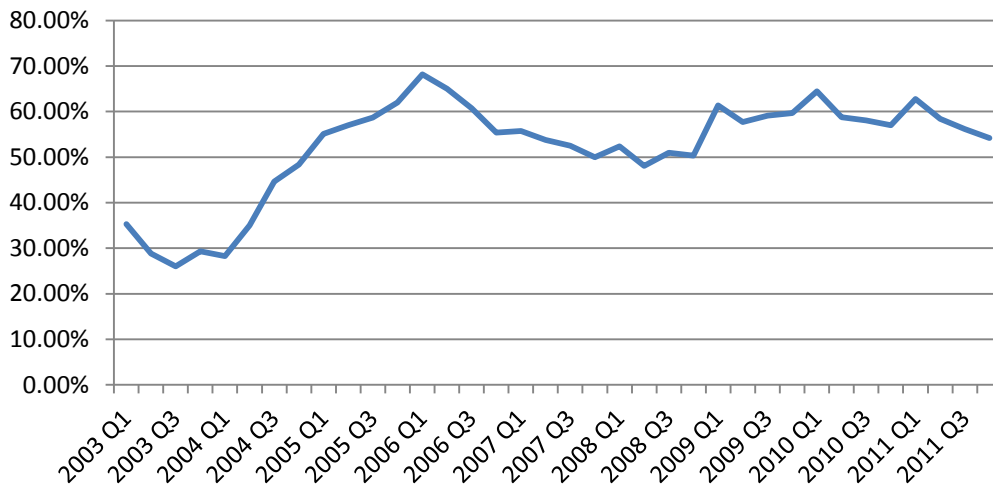
The first major period of change occurred between quarter three of 2003 and quarter four of 2005. If we look at *figure 1.1*, we see that there is an increase in inflation that appears to be correlated with the level of dollarization. In the case of Argentina, when we run the second and third regression (as seen in *chart 1.0)* we see that there is a positive relationship between changes in inflation and changes in dollarization, this means that when inflation increases, dollarization is likely to increase. This slightly positive relationship confirms what we see in *figure 1.1 and 1.2* that suggests that movements in dollarization are positively correlated with movements in inflation. Additionally, if we look at *figure 1.3* we see that during this time period there is a substantial decrease in the unemployment rate. The unemployment rate reached a peak at 20.23% in the first quarter of 2002 and reduced to 7.5% by the fourth quarter of 2007. This drastic decrease in unemployment means that more people were working and thus were able to consume and save more money. Much of this saving would likely be in U.S. dollars in order to help ensure a store of value for their deposits.

16

Chart 1.0 – Regression Results for Argentina

Variable	Coefficient	Standard Error	T-statistic	P>|t|
Regression: $d_t = \alpha + \beta_1(\pi_t) + \varepsilon_t$				
π_t	.0192735	.3670662	.05	.958
Constant	.5200743	.0389813	12.34	.000
Regression: $\Delta d_t = \alpha + \beta_1(\Delta \pi_t) + \varepsilon_t$				
$\Delta \pi_t$	.2305128	.0590558	3.90	.000
Constant	.0174864	.0142198	1.23	.227
Regression: $\Delta d_t = \alpha + \beta_1(\Delta \pi_t) + \beta_1(\Delta \pi_t) + \varepsilon_t$				
$\Delta \pi_t$	.2445979	.0686084	3.57	.001
$\Delta \pi_{t-1}$	-.0286638	.068135	-.42	.678
Constant	.0173829	.014403	1.21	.236

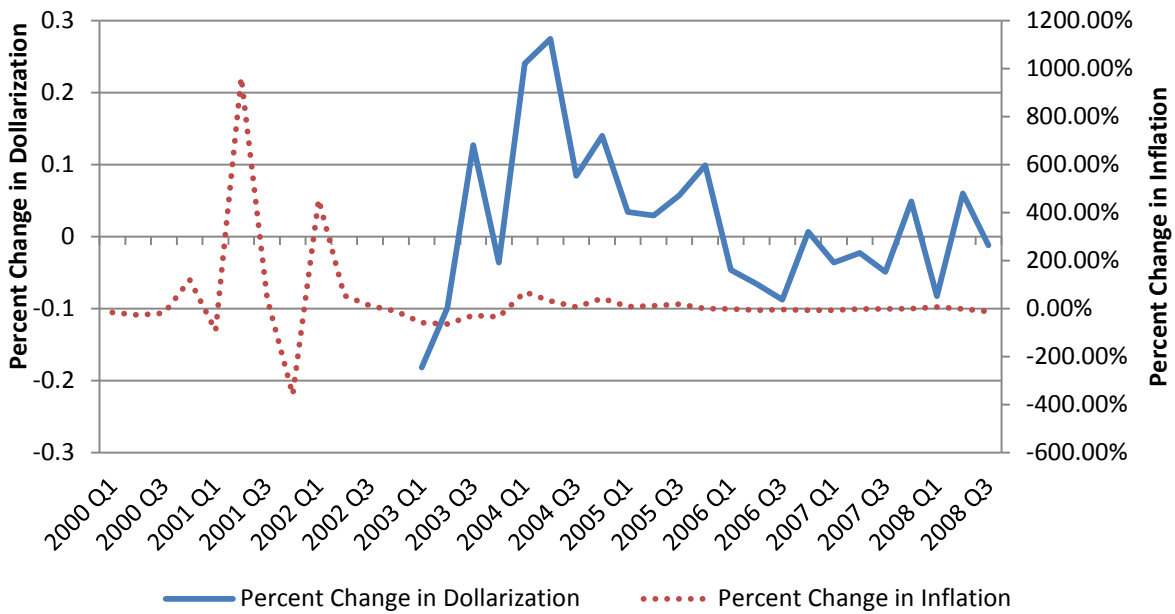**Figure 1.1 – Percent Change in Dollarization and Inflation in Argentina**

17

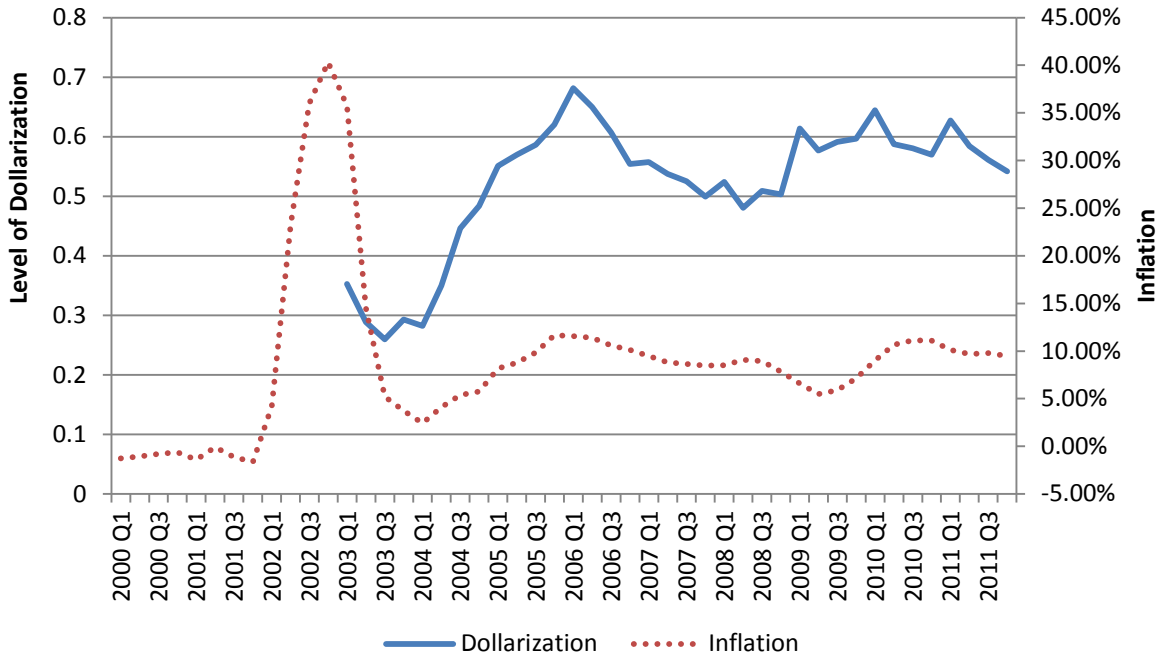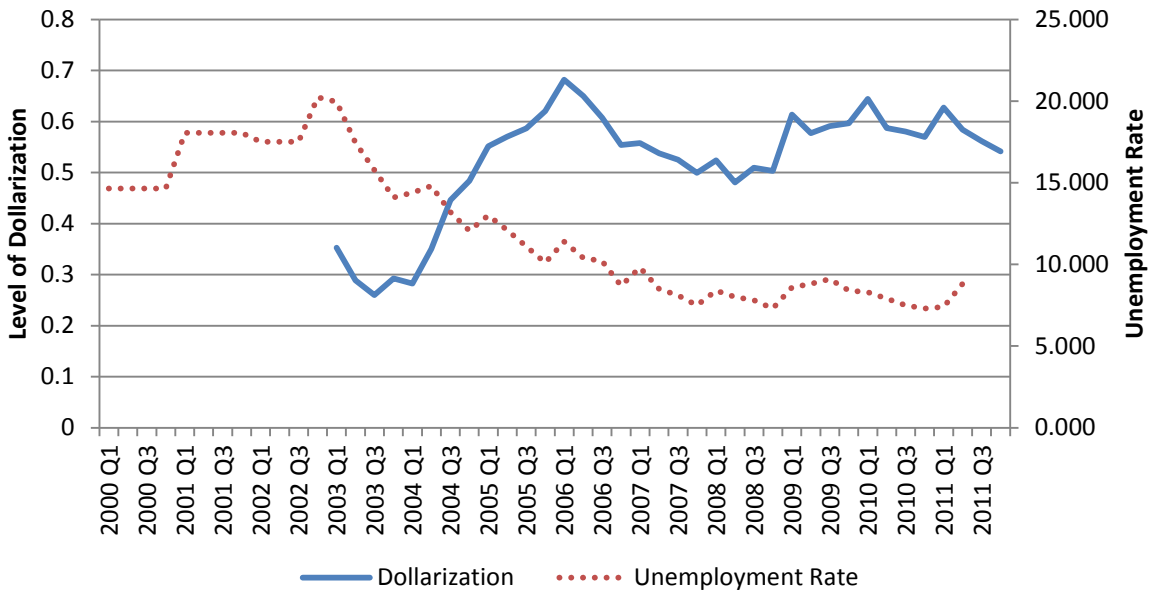**Figure 1.2 – Level of Dollarization and Inflation in Argentina**

Figure 1.3 – Unemployment and Dollarization Levels in Argentina

A third likely correlating factor for the huge increase in dollarization during 2003-2005 is

the increase in exports as seen in *figure 1.4*. Between the beginning of 2003 and the end of 2004,

exports increased substantially, with a growth rate averaging over 16% for that period. This is

important when we talk about dollarization because exports mean an inflow of foreign money.

In less stable markets, foreign companies who participate in international trade tend to agree

upon a stable currency to transact in, in order to protect themselves from severe exchange rate

fluctuations. This is likely what occurred in Argentina, many companies were transacting in

U.S. dollars and thus needed to keep their domestic accounts in U.S. dollars so that they could

continue to do business with foreign companies.

Figure 1.4 – Dollarization versus Percent Change in Exports in Argentina
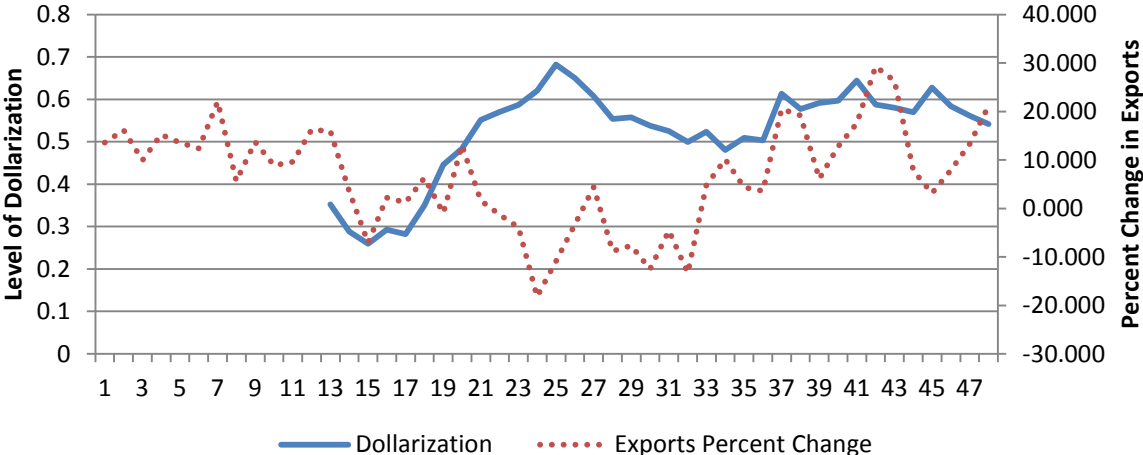
A fourth likely correlating factor to the drastic increase in dollarization in Argentina

between 2003 and 2005 is the GDP growth, as seen in *figure 1.5*. Between the first quarter of

2002 and the fourth quarter of 2003, GDP growth had increased by 28% (from -16.3% to

positive 11.7%). This drastic increase in GDP means that Argentineans were becoming better

off and able to make positive improvements in terms of their national well-being. This is import

for a couple of different reasons. First off, it means that exports likely were increasing as seen in

figure 1.4. Additionally, increases in GDP means that consumers and business have more

19

money. This means that they have more money to consume and more money to save.
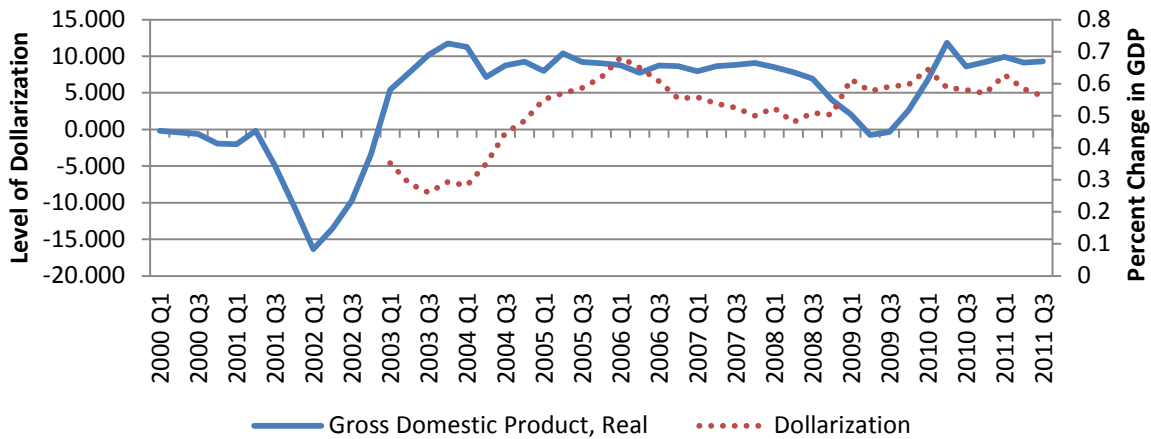
Another correlating factor to the increase in dollarization levels is the drastic increase in production and price of soy throughout the twenty-first century. Argentina is the third largest exporter of soy in the world, so an increase in commodity pricing of soy has a huge effect on Argentina's economy (Casadinho, 2008). Soy is even more important to Argentina's success when you consider the fact that soy now makes up approximately one third of Argentina's exports (Casadinho, 2008). This large increase in the exportation of soy provides huge inflows of foreign currency and an increase in the number of foreign currency deposits.

After the huge increase in the levels of dollarization between 2003 and 2005, the level has had a few other major fluctuations. From the first quarter of 2006 until the first quarter of 2008, the level of dollarization decreased by 25% from 70% to 45%. Again if we examine the other indicators we see a similar pattern. Inflation fell during this period as seen by *figure 1.1 and 1.2* and suggested by the second and third regression when comparing what happened to the level of dollarization during the same time period. The unemployment rate fell during the 2006-2008 period. The level of exports fluctuated, and GDP growth remained relatively stable at about 7%. This period, however, comes after a major breakthrough in Argentina's post-currency

board existence.

In addition to the previous mentioned reasons for decreasing levels of dollarization, much of the decrease is likely a residual effect of the 2005 debt restructuring that Argentine underwent. Proposed in 2004 and executed in 2005, Argentina paid down a substantial amount of debt. In June of 2004, the Argentine government proposed a plan that would cut the nominal value of debt by approximately 75% and offer bond swap options to creditors. This restructuring plan was rejected by creditors. In mid-July, creditors produced a counter-proposal that agreed to cut the debt by 40-45% of the debt in terms of net present value. This counter-proposal was rejected by the Argentine Government. With discussion underway, in November of 2004 Argentina came out with a debt restructuring program that captured the attention of approximately 76% of creditors. This program essentially cut the net present value of debt by 70% instead of the 75% proposed in June. The effect that this program had was to replace the defaulted bonds with bonds of a lesser face value with an extended maturity and lower coupon rate. This resulted in Argentina's debt being reduced to only 66.2% of GDP, compared to 121.7% of GDP before the restructuring (Weisbrot, 2009). At the time of restructuring, the Argentine government was forcefully offering the near 70% devaluation in debt as a take it or leave it offer. The government had no plans to develop a new restructuring plan and couldn't guarantee payment in any other way or form. In fact, the Argentine Legislature passed a law that prohibited reopening a debt restructuring offer (Hornbeck, 2010). This restructuring effort allowed creditors to concede their losses and gain back a little bit of the money that they had invested in the Argentine economy. According to *The Third World Quarterly*, "The Argentine government indicated that it would not recognize the claims of the remaining bond holders who did not participate [in the 2005 restructuring]." (Helliener, 2006). The reason that this is important is

because much of the decision on which currency to hold money in is due to the perceived security of a currency. With Argentina paying down its international debt, they are sending a message to the rest of the world and to their own people that their currency is stable and that there is no need to hold wealth in foreign currencies. The effects of this debt pay down are yet another contributing factor in the reduction of dollarization levels in Argentina during this period.

The next period of significant change is from the first quarter of 2008 until the first quarter of 2009. This period saw an increase in the level of dollarization from ~45% to ~63%. During this period there are some changes of other indicators as well. These include an increase in inflation, a decrease in GDP, and an increase in quarter 1of 2008 in exports followed by a substantial fall during the rest of the period. It is likely that by 2008 the majority of the consumer confidence gained by the 2005 debt payoff had worn off. This coupled with a falling GDP and level of exports seems to be correlated with a fall in consumer confidence and thus resulting in a flight-to-quality away from domestic currency towards U.S. currency. This was also the period of the beginning of the global economic crisis. During periods of crisis, many investors leave risky assets and instead focus on more secure assets. In this case, those risky assets are Argentine peso and the stable assets are U.S. dollars.

The final major trend in the level of dollarization in Argentina can be seen from 2009 until the present. Since the first quarter of 2009, the level of dollarization has fluctuated slightly around 60%. When we consider the state of the Argentine economy, this tends to make sense. Largely because Argentina doesn't have access to international debt markets as they continue to battle with creditors to try and pay off their residual debt from the 90s. Additionally, the rate of inflation and unemployment has remained fairly stable, and exports and GDP have both returned

to a positive level.

II. CHILE CASE STUDY: 2000-2011

Chile has a drastically different economic history than does Argentina. In Chile, much of

economic policy and decision making has been shaped by the "Chicago Boys" with a neo-liberal

economic doctrine that was a result of the coalition between La Universidad Católica de Chile

and the University of Chicago in which Chilean students were educated in neoliberal economic

doctrine at the University of Chicago (Biglaiser, 2002). This neo-liberal thought has infiltrated

the Chilean economy in that Chicago has opened itself up to economic liberalization, they have

privatized many state-owned companies, and have largely stabilized inflation.

These initiatives have caused Chile's and Argentina's economies to differ drastically, yet

it still has a high level of dollarization, as seen in *figure 2.0*. There are several likely reasons that

Chile's level of dollarization remains around 50%. These include Chile's open economy and its

dollarization level being strongly correlated with changes in inflation and GDP, Chile's

establishment of itself as an investment haven, the law requiring a government surplus of 1% of

GDP, and the recent free trade agreements that Chile has reached with the E.U., Korea, and the

U.S.

Figure 2.0 – Level of Dollarization in Chile

If we look at *chart 2.0* we see what appear to be positive correlations associated with changes in dollarization and inflation and the levels of dollarization and the levels of inflation, as measured by regression 2 and 1, respectively. These results, however, are not statistically significant so we cannot draw any conclusions from them.[2] Keep this positive relationship in mind when looking at *chart 2.0* which suggests that this relationship should show a correlation. In addition to this, Chile has several policy projects working that may also influence the levels of both dollarization and inflation.

**Chart 2.0 – Regression Results for Chile**

Variable	Coefficient	Standard Error	T-statistic	P>|t|
Regression: $d_t = \alpha + \beta_1(\pi_t) + \varepsilon_t$				
π_t	.9627051	.9184871	1.05	.300
Constant	.6194982	.0366135	16.92	.000
Regression: $\Delta d_t = \alpha + \beta_1(\Delta\pi_t) + \varepsilon_t$				
$\Delta\pi_t$	.0006592	.0004642	1.42	.163
Constant	-.0023984	.012381	-.19	.847
Regression: $\Delta d_t = \alpha + \beta_1(\Delta\pi_t) + \beta_1(\Delta\pi_t) + \varepsilon_t$				
$\Delta\pi_t$	.000653	.0004737	1.38	.175
$\Delta\pi_{t-1}$	-.000166	.0004737	-.35	.728
Constant	-.0037397	.0128924	-.29	.773

Chile has been working to establish itself as an investment haven for FDI. It has done this by structuring its laws such that FDIs are treated the same as Chileans. This has created a large increase in investment and subsequently a large inflow of foreign currency. If we look at *figure 2.1*, we see that FDI has risen drastically since 2000 totaling more than 93 billion U.S.

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[2] If the Chilean regressions are run for the period from 2005-2011, the regression results become statistically significant. The coefficient of β_1 for regression 1 becomes 1.167455.

dollars. This means that Chile has had 93 billion dollars worth of foreign currency flow into their economy ever the past decade.

Figure 2.1 - FDI in Chile
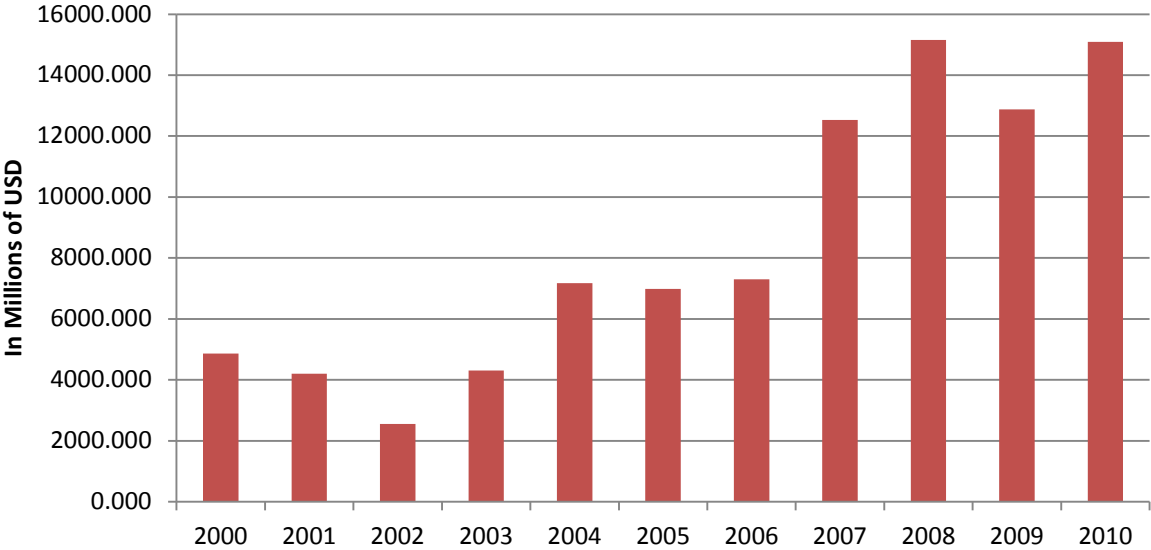
Chile has a law that requires them to maintain a surplus of at least 1% of overall GDP. This surplus allows them to pay down international debt and to invest in a "rainy day" fund to secure that they will have the ability to pull themselves out of economic turmoil should they need to. This is an important consideration when looking at dollarization as they are securing that 1% surplus in case anything bad happens, this means that they have a supply of money to help take substantial action to kick start or slow down their economy in the event that conditions require such action. This shows substantial forward thought in preventing future economic turmoil. This, in turn, helps to stabilize their economy, keep inflation relatively modest (as seen in *figure 2.2*), and subsequently demonstrate economic stability that caters to decreasing levels of dollarization.

Figure 2.2 – Dollarization and Inflation in Chile
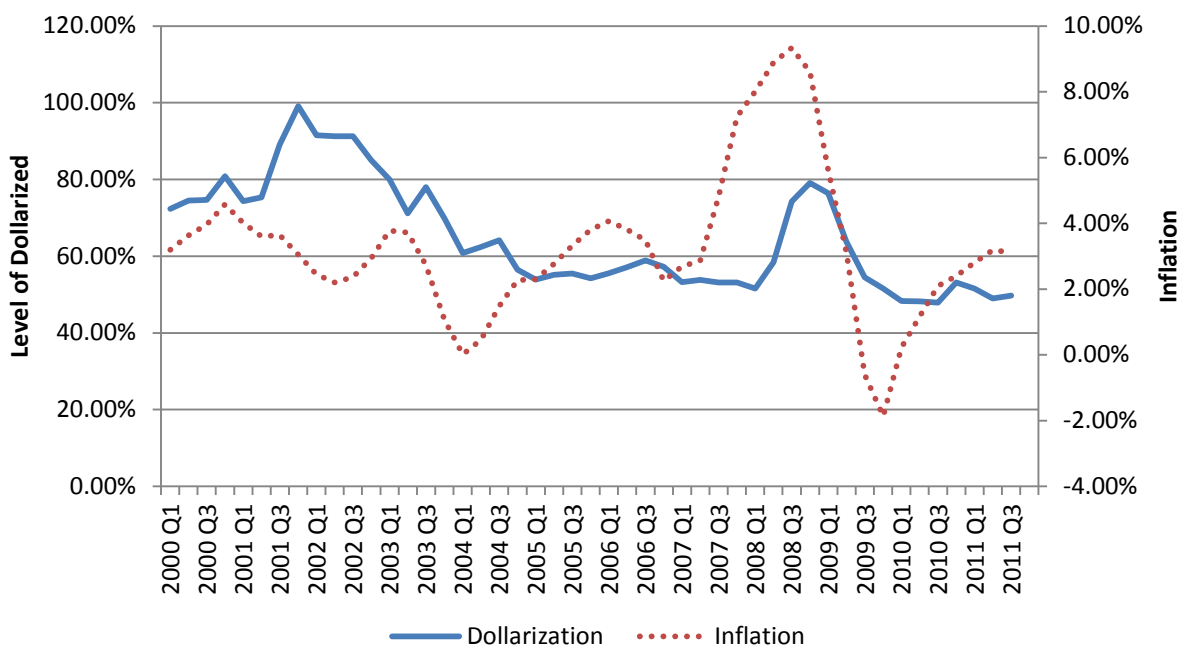
The third correlating factor as to why Chile maintains such a high level of dollarization is due to their free trade agreements with several foreign countries. Chile negotiated free trade agreements with the E.U. in 2002; the United States in 2003 with a phase in beginning in 2004; with Korea in 2004; with China in 2006; and with India and Japan in 2007. These free trade agreements have opened markets and reduced trade barriers considerably in Chile. With these open markets, Chile has increased their ability to buy and sell on international markets. Additionally, increased international trade likely leads to a demand for international currency to conduct these transactions in. In international transactions a very popular transactional currency is the U.S. dollar.

Now let us examine the fluctuations in levels of dollarization and the correlating economic factors. We will break Chile's level of dollarization into four main periods of fluctuation. These will be April 2001-January 2002; January 2002-January 2005; March 2008-January 2009; and January 2009-August 2009. When examining these periods, we noticed that

the fluctuations in dollarization levels seem to be highly correlated with changes in GDP and inflation.

In the first period of fluctuation, Q1 2000-Q4 2001, we see that dollarization levels increase from around 70% to near 100%. In terms of GDP, this period marks a decrease in growth of about 1% to a level below the minimum target of 2%. It also corresponds to a decrease in the CPI growth rate by 1%. These decreases in inflation and GDP might seem fairly insignificant and might not be highly correlated with such a rise in dollarization. I suspect that another contributing factor to the huge increase in dollarization is due to contagion or "spillover" from Argentina's economic turmoil at the time as is suggested by Reinhart and Calvo in their 1996 paper titles, *Capital Flows to Latin America: Is there Evidence of Contagion Effects?*. During this period, Argentina had defaulted on its debt, ended its currency board, was facing a banking crises, and had a foreign exchange crises. It is likely that many Chileans were worried about how the Argentine situation could affect their economy and thus, fled to safety in foreign denominated currency.

The next period of fluctuation occurred between Q1 2002 and Q4 2007. During this period, dollarization fell from around 100% to around 55%. During this period, the factor that appears to be the most correlated with the shift in dollarization is the fluctuation in the exchange rate and the negative correlation with the increase in the growth rate of the GDP. If we look at *figure 2.3* we see that when GDP growth was positive, dollarization decreased slightly and when GDP growth was negative, dollarization increased. If we look at *figure 2.4,* we see that decreases in the exchange rate appear to have a high positive correlation with changes in the level of dollarization. In the period from January 2002 until January of 2005, the GDP of Chile grew from around 2% to around 8%. This likely helped to answer the concern over whether or

not Chile would suffer the same economic crises that Argentina was suffering or whether they were economically stable.

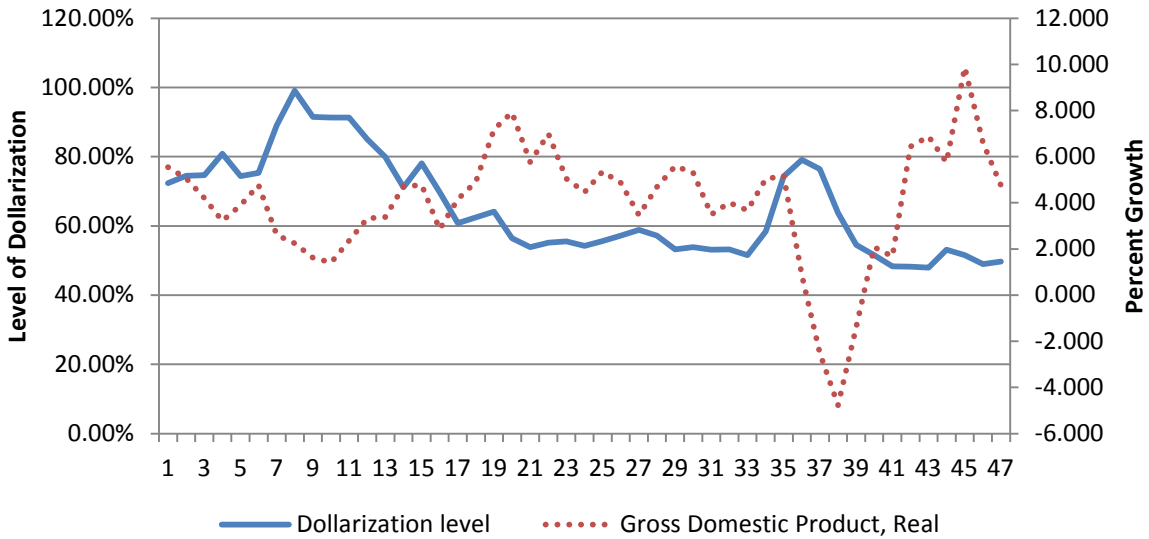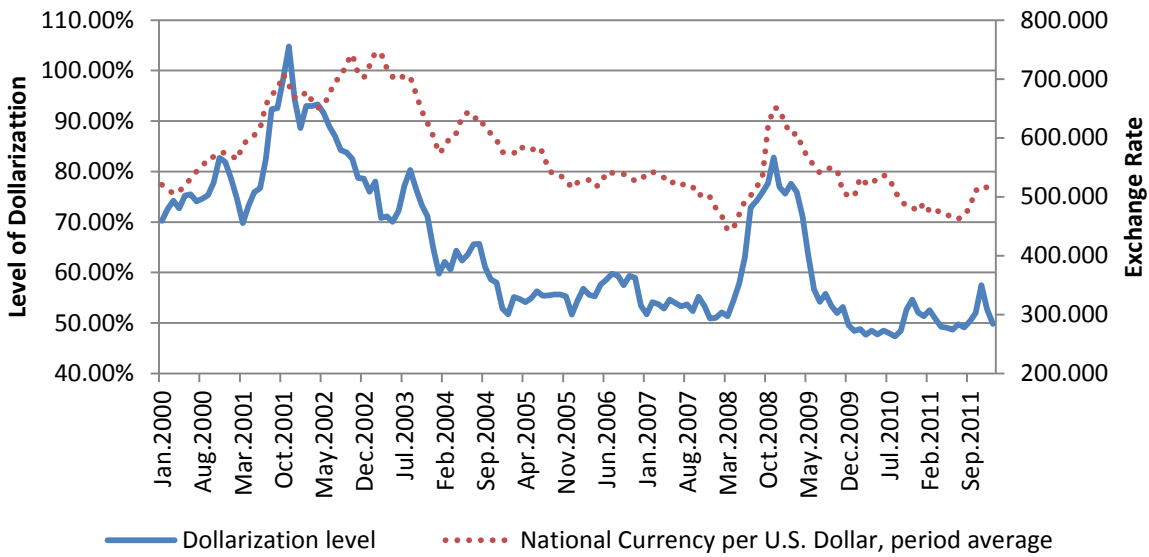**Figure 2.3 – Dollarization versus GDP Growth in Chile**

Figure 2.4 –Dollarization versus Exchange Rate in Chile

The third period of major fluctuation occurs between the period of March 2008 and January 2009. During this period, the rate of inflation decreased by about 8% and the GDP decrease from a positive 5% growth rate to a -5% growth rate or a decrease in growth of about

10%. The level of dollarization during this period increased from about 50% to about 75% or an increase of about 25%.

The fourth period of major fluctuation occurs between the period of January 2009 until August of 2009. During this period, the level of dollarization decreased from around 75% to around 50% a decrease in about 25%. This period correlates with an increase in the growth rate of GDP by about 7% (from -5% to 2%).

In looking at each of the periods of fluctuation in dollarization in Chile and the regression results in *chart 2.0*, we see that the changes in levels of dollarization is positively correlated with fluctuations in inflation. *Figure 2.2* shows us this relationship. In the periods where there are major positive fluctuations in the inflation there appears to also be major positive fluctuations in the levels of dollarization and vice versa. This is likely a result of the volatility that Chile's neoliberal ideology and the degree of openness that results. If also look at *figure 2.3 and 2.4,* we see that Chile also shows a strong correlation between the dollarization level and GDP growth and dollarization and changes in the exchange rate.

III.   ECUADOR CASE STUDY: 2000-2011

Now let us examine the Ecuadorian case. On January 9th, 2000, the Ecuadorian President, Jamil Mahuad, announced a dollarization program for Ecuador. In order to understand the reasoning for this, let us look at the economic circumstances that Ecuador was facing prior to the dollarization decision.

In the 1990s, Ecuador had several macroeconomic and structural crises. Luis Jácome outlines some of the major issues in his 2004 working paper:

> *"In the late 1990s, Ecuador suffered its worst economic crisis. The 1999*
> *economic downturn was the steepest, and the following year inflation hit record*
> *highs. The underlying cause of the upheaval was the collapse of the banking*
> *system, which was accompanied by a simultaneous currency and public finance*

crisis. The crisis involved 16 banks—out of the 40 existing in 1997—and was triggered by a combination of exogenous and policy-induced shocks which led the market to lose confidence in both the banking system and the domestic currency, While government liabilities increased dramatically until the country defaulted on its recently restructured Brady debt. On the brink of hyperinflation and immersed in a deep macro financial crisis, the government adopted the U.S. dollar as legal tender as a substitute to the sucre in January 2000. Today [January of 2004], the economy has stabilized and the financial system has recovered, although by the end of 2002 the country's degree of financial intermediation had not yet returned to its pre-crisis level." (Jácome, 2004)

In addition to the issues with the banking system outlined above, Ecuadorians were facing rising debt. The debt was $600 million in 1973 and rose to $16.4 billion in 1998; as a percentage of GDP it grew from 20% in 1973 to 118% in 1998. Despite devaluation against the dollar and a depreciated real exchange rate, quantity of export declined in 1998. Other economic indicators also looked grim, with unemployment rising from 11.8% to 15.1%, the exchange rate collapsing from 6,825 sucres per dollar to 20,242 sucres per dollar.

There was also a degree of political pressure to dollarize. As outlined by Kenneth Jameson in his 2003 article, there were several options that President Mahuad could have implemented to help combat dollarization, inflation, and the general economic condition. These alternatives include dismissing congress in a "Fujicoup" such as the one that occurred in 1992. This would allow the president to implement a coherent economic policy. Another option would be to implement a convertibility program and a currency board such as in Argentina. Another option would have been to "sucretize" financial accounts, or convert all dollar denominated accounts to sucres. President Mahuad, instead, decided to dollarize. This was the position that was being heavily suggested and lobbied for by powerful interests in the country's main port of Guayaquil (Jameson, 2003). In addition to these political pressures, Ecuador was also being pressured on an international level, as was Argentina, to dollarize. During the period of 1999-2001, both Ecuador and Argentina were facing rising debt and eminent banking and exchange

rate crises. Both countries were also considering dollarizing. The consideration was due to the anticipated security that would come with dollarization. In the case of Argentina, they have a fairly large economy and dollarizing would be restrictive towards economic decisions. In the case of Ecuador, on the other hand, you are talking about a smaller economy who is seeking the security that comes with accepting U.S. monetary policy.

With this in mind, Ecuador dollarized in 2000. At this time they were facing substantial inflation, high unemployment, and relatively low GDP growth. As you can see in *figure 3.0*, today inflation has gone down considerably. *Figure 3.0* shows us the level of inflation since 1990, after the initial shock of dollarization went away inflation has been considerably lower in the past century than it was during the decade leading up to dollarization. In addition, as seen in *figure 3.1*, unemployment has seen a general decrease and has remained below 10% since 2006. Additionally if we look at *figure 3.2* we see that there has been only positive GDP growth since dollarization was implemented in 2000.

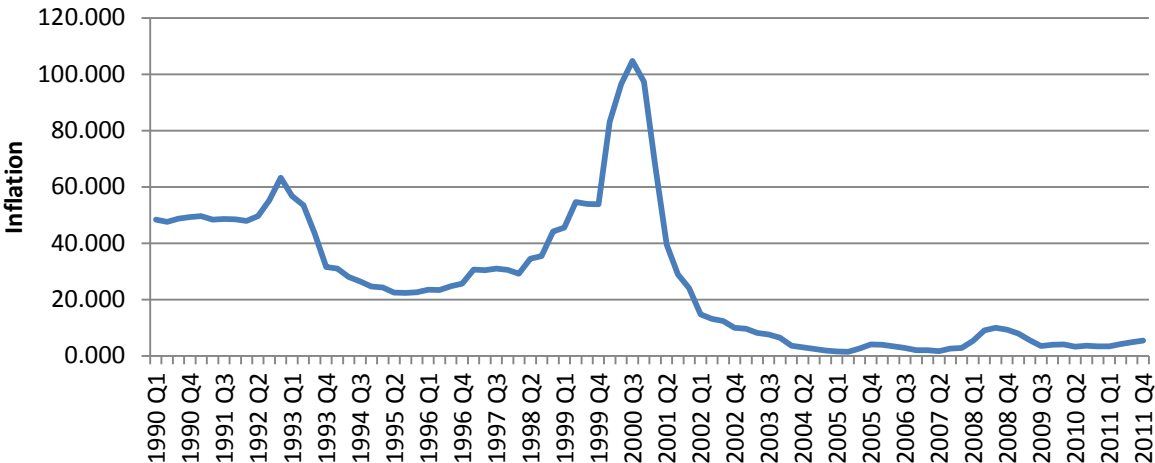**Figure 3.0 – Inflation in Ecuador**

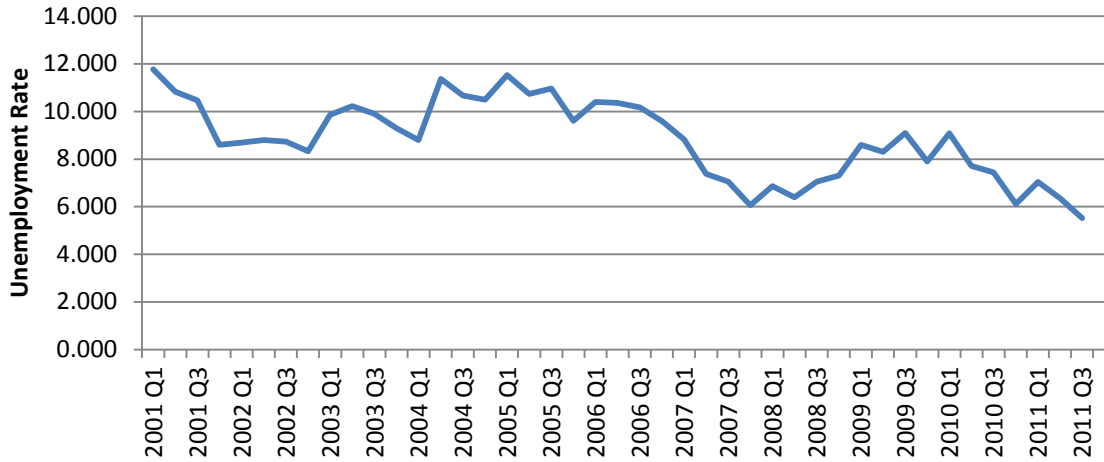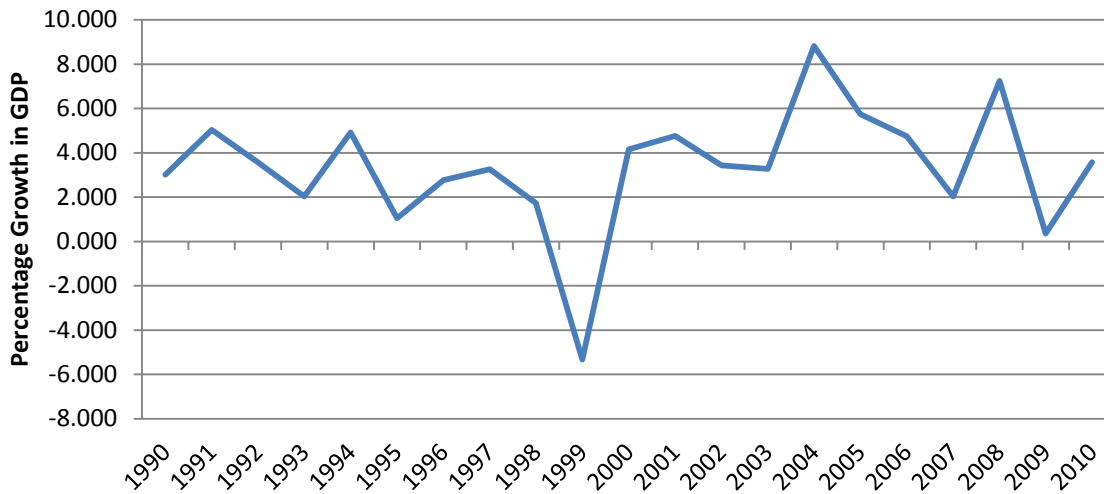**Figure 3.1 – Unemployment Rate in Ecuador**

Figure 3.2 – GDP Growth in Ecuador

With all of these indicators looking positive, you may wonder what the downside of dollarization is. In the case of Ecuador there are several things that could end the positive gains that we see in *figure 3.0-3.2*. These include oil prices decreasing. Over half of Ecuador's exports are comprised of oil (*The World Factbook 2011*, 2011). This means that substantial

fluctuation in the world price of oil could have a substantial affect on the export revenue of Ecuador. Additionally, emigrant remittances make a significant impact on Ecuador's GDP. The World Bank estimates that 4.43% of Ecuador's 2010 GDP was accounted for by emigrant remittances. This is down from 2007 when it accounted for 6.80% of GDP. Remittances tend to fluctuate with the state of the host country's economy. For the case of Ecuador, the majority of emigrants are in the United States and Spain. This means that the level of remittances will tend to fluctuate with the market conditions in these countries. If Ecuador was not dollarized, the exchange might help to make these fluctuations less significant as there would likely be fluctuating exchange rates that would help to ease such changes in remittance levels. Without control of the exchange rate, however, a significant percentage of Ecuador's GDP is dependent on international market conditions. Other reasons that the numbers in *figures 3.0-3.2* look so positive is due to the level of foreign aid and investment projects that occurred immediately after Ecuador dollarized. Many of these projects had a 10-15 year timeframe and have been employing Ecuadorians since the onset of dollarization (Jameson, 2003). Finally, Ecuador has been holding off payment on many of its foreign debts as it has worked with creditors to determine an appropriate agreement with them. Once these payments start occurring, it is likely to drain a lot of foreign currency out of the market and hurt their levels of inflation and GDP growth.

With this said, the current levels of inflation, GDP growth, and unemployment are all in target ranges. The concern is keeping these levels in the target range. Kenneth Jameson, in his 2003 article, suggests that many of the problems that helped to cause Ecuador to dollarize are still present and need to be addressed in order to prevent another market collapse. These problems are unequal income distribution, deteriorating public services, peasant unrest, and

political instability.

IV.   PERU CASE STUDY: 2000-2011

In order to understand the reason for Peru's steady decrease in dollarization level, you first must look at the circumstances surrounding Peru's initial dollarization level. Dollarization became prevalent in Peru beginning with the inflationary process of the mid-70s and peaked during the hyperinflation of 1988-1990 (Garcia, 2010). Prior to Peru's period of extremely high inflation (1975-1990), the level of dollarization in the economy was about 13% (van der Haegen & Viñals, 2003). In 1985, Peru attempted to de-dollarize by converting all dollar denominated deposits to Nuevo Sols (Peru's local currency). This move resulted in major capital flight and drew scrutiny for not helping to alleviate the true causes of dollarization. Thus, when the restriction on foreign currency was lifted, re-dollarization occurred rapidly (Garcia-Escribano & Sosa, 2011).

Realizing that simply converting deposits from US based deposits into local currency wasn't addressing the root of the problem, Peru decided to take a different approach. In early 2000, Peru introduced an inflation targeting (IT) regime. This regime aimed to keep inflation at a rate significantly lower than historical levels. This, they thought, would help to demonstrate economic stability and would demonstrate the validity of their economic programs. In looking at the correlation between changes in dollarization and changes in inflation using the second regression (results found in *chart 4.0*) we see that there is a positive relationship between these two variables. This number is not statistically significant, however.

In addition to this inflationary targeting, Peru has introduced different prudential measures to lower banks' incentives to borrow and lend in foreign currency, has raised provisions for foreign currency loans, and has tightened capital requirements against open

foreign exchange positions. These policies have helped to transition lending and borrowing from occurring in foreign currency into Nuevo Sols (Peruvian currency). Furthermore, Peru has developed asymmetric liquidity requirements for foreign and domestic currency liabilities. This policy was also aimed at creating a disincentive to save in foreign currency as it is a system to overcompensate investors for taking on the risk associated with lending in domestic currency.

In addition to these requirements, Peru has developed a capital market in local currency through the issuance of long-term public bonds in domestic currency. Peru has issued public debt in domestic currency with maturities over 10 years, the longest being up to 32 years. This has helped to create a capital market, and thus it is now easier to lend in domestic currency.

The result of these macro-economic initiatives has been impressive. If we look at *figure 4.0 and 4.1*, we see that Peru has been able to maintain fairly stable inflation rates since implementing these programs in the early 2000s. Impressively keeping inflation rates below 7% for the entire decade compared to previous levels of inflation which were consistently above 7%.

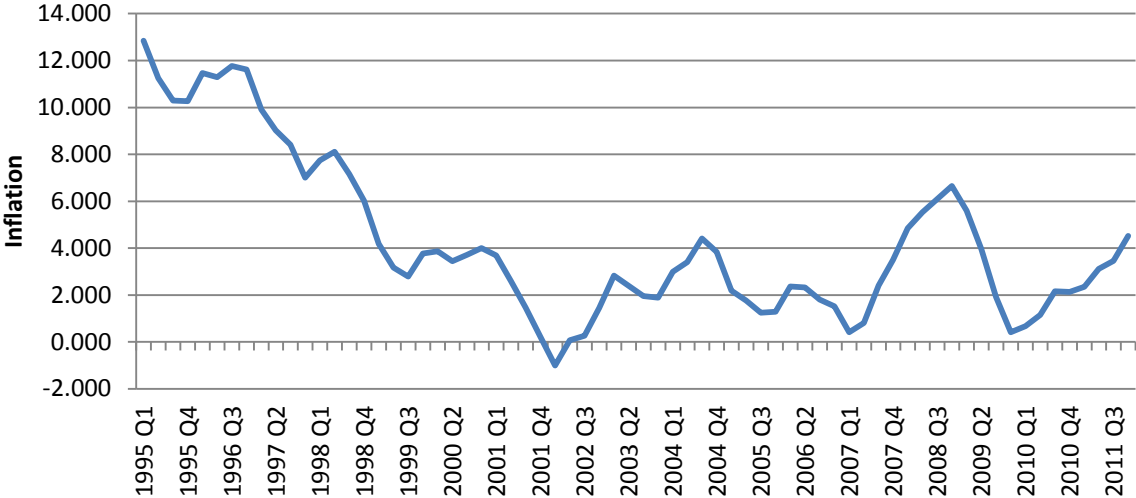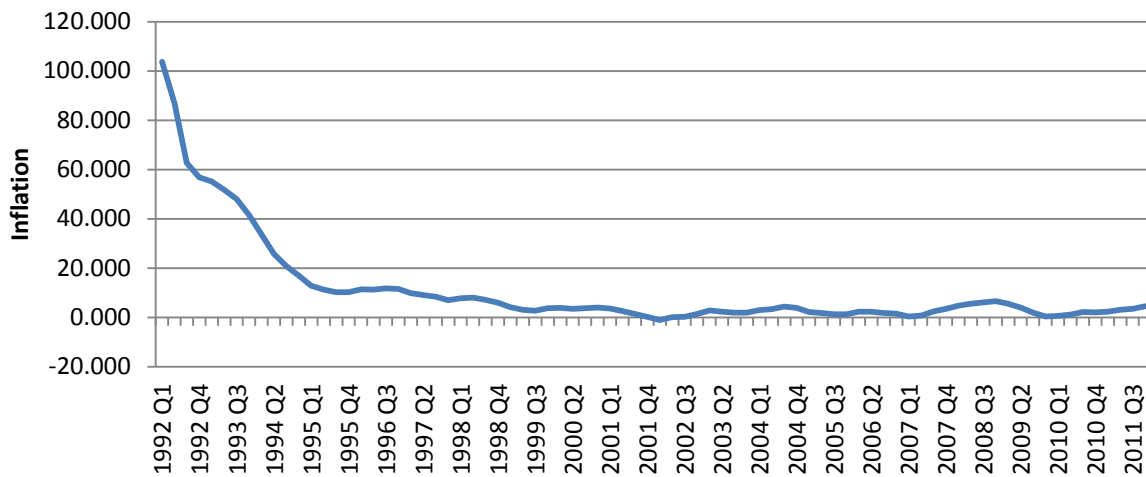**Figure 4.0 – Inflation Since 1995 in Peru**

**Figure 4.1 – Inflation Rate Since 1992 in Peru**

This initiatives and especially the inflation stability has a strong correlation to the amount of de-dollarization that has occurred in Peru throughout the past decade, as seen in *chart 4.0*. The true result, however, is the decrease in the level of dollarization that we see in *figure 4.2*. This figure shows us that Peru has gone from having levels of dollarization around 60% in the early 2000s to having levels below 30% today. You see a slight uptick in dollarization in 2008, this is largely correlated to the global financial conditions at the time. Global economic conditions were uncertain so many people rushed to banks to withdraw their deposits, especially their short term sol denominated deposits. This fear of a run on the bank didn't last long however, and the dollarization level has continued to decrease since the middle of 2008. The main reason that the level has continued to fall, however, has changed. While in the early years of the new millennium we saw people converting their deposits from US dollars to sols, since 2008 the decrease in dollarization is largely due to increases in sol denominated deposits, and less so because the amount of dollar denominated deposits is decreasing.

Chart 4.0 – Regression Results for Peru

Variable	Coefficient	Standard Error	T-statistic	P>|t|
Regression: $d_t = \alpha + \beta_1(\pi_t) + \varepsilon_t$				
π_t	-1.102348	1.04064	-1.06	.295
Constant	.4397125	.0318405	13.81	.000
Regression: $\Delta d_t = \alpha + \beta_1(\Delta\pi_t) + \varepsilon_t$				
$\Delta\pi_t$	.0017841	.0024491	.73	.470
Constant	-.0166593	.005793	-2.88	.006
Regression: $\Delta d_t = \alpha + \beta_1(\Delta\pi_t) + \beta_1(\Delta\pi_t) + \varepsilon_t$				
$\Delta\pi_t$	.0015754	.0024931	.63	.531
$\Delta\pi_{t-1}$	.0020419	.0024929	.82	.417
Constant	-.0173471	.0059281	-2.93	.005

Figure 4.2 – Level of Dollarization in Peru
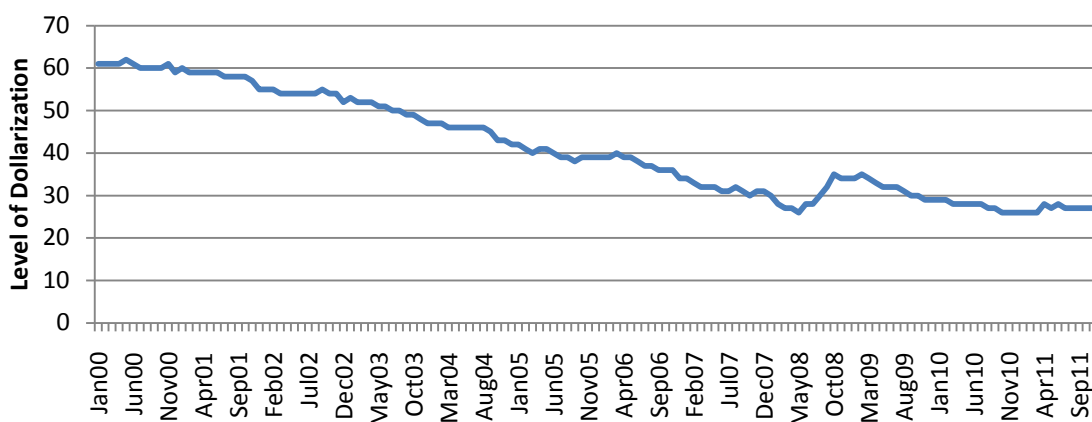
If we look at *figure 4.3* we see the level of dollarization coupled with the fluctuations in the exchange rate since 2000. It is clear from *figure 4.3* that there is a strong correlation between the level of dollarization and the exchange rate for Peru beginning in the second half of 2002. This corresponds to the period in which their macro-economic policies to reduce the level of dollarization started to take effect.

Figure 4.3 – Dollarization versus Exchange Rate in Peru
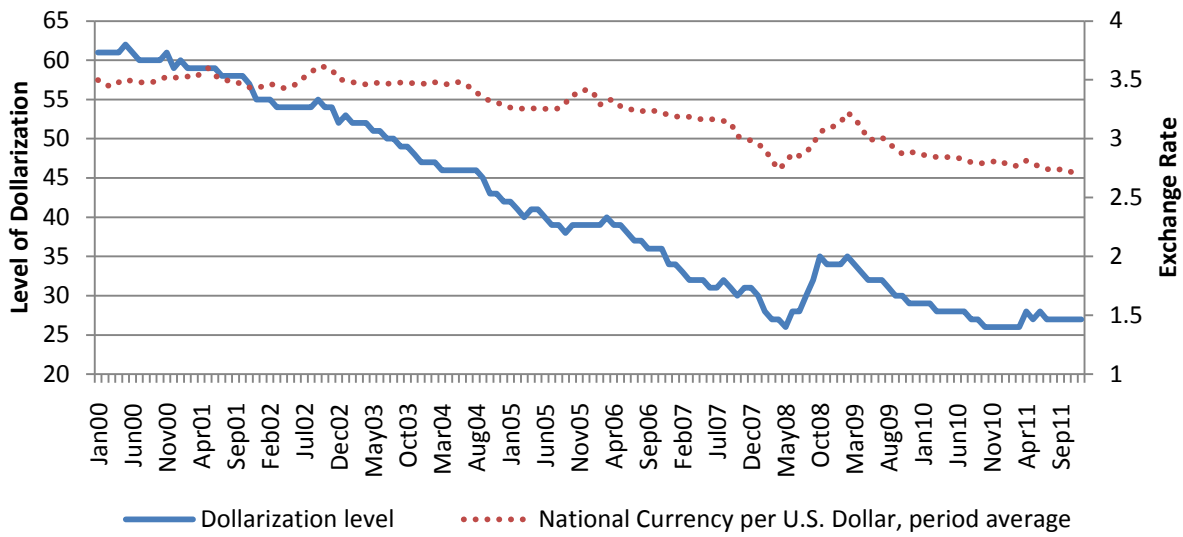
Many economists believe that Peru is a great example of the benefits of unofficial dollarization (Garcia-Escribano & Sosa, 2011). Peru was able to lean on the dollar in order to help get its fiscal cards in order. Now that it has addressed the root cause of why dollarization was occurring, their domestic currency is flourishing and they are in complete control of their economy and monetary policy.

V.   URUGUAY CASE STUDY: 2000-2011

Uruguay started facing significant levels of dollarization during the 1970s, the same period that much of Latin American started facing increasing levels of dollarization. This is largely a result of Uruguay's government (in union with much of Latin America) reducing exchange rate controls. This made keeping deposits in dollars more feasible and more secure as you were guaranteed to be able to exchange the money. This resulted in Uruguayan dollarization levels rising from a mere 5% in 1973 to 45% by 1977 (Jameson, 2003).

The levels of dollarization continued to increase throughout the rest of the century as economic instability started growing more prevalent and Uruguay started facing periods of high inflation. This story of dollarization didn't end there. Throughout the 80's and 90's Uruguay,

whose currency was pegged to the U.S. dollar experienced several devaluations of their currency. In fact, devaluation in Uruguay was so frequent that they developed a term specifically for it, *atraso cambiario*, which means "the exchange rate is running late." Additionally, Uruguay experienced a banking crisis in the 80's that prompted more people to flee Uruguay Pesos for U.S. dollars. This instability in the local currency has resulted in many big-ticket items to be denominated in U.S. dollars (Kamin, 1999). This led Uruguay's level of dollarization to increase steadily throughout the 80's and 90's to the levels that we see in *figure 5.0.* If we again look at *figure 5.0* we see that Uruguay has had a level of dollarization above 70% for the entire century. The level of dollarization has come down a little bit from near 90% in the early 2000s, but still remains at a very high level. There are several likely contributing factors that continue to cause the dollarization level in Uruguay to be high, these include Uruguay's prominence as an "offshore banking center" for many Argentineans and Brazilians, their level of exports, and the way that Uruguay handled itself after its debt and banking crisis.
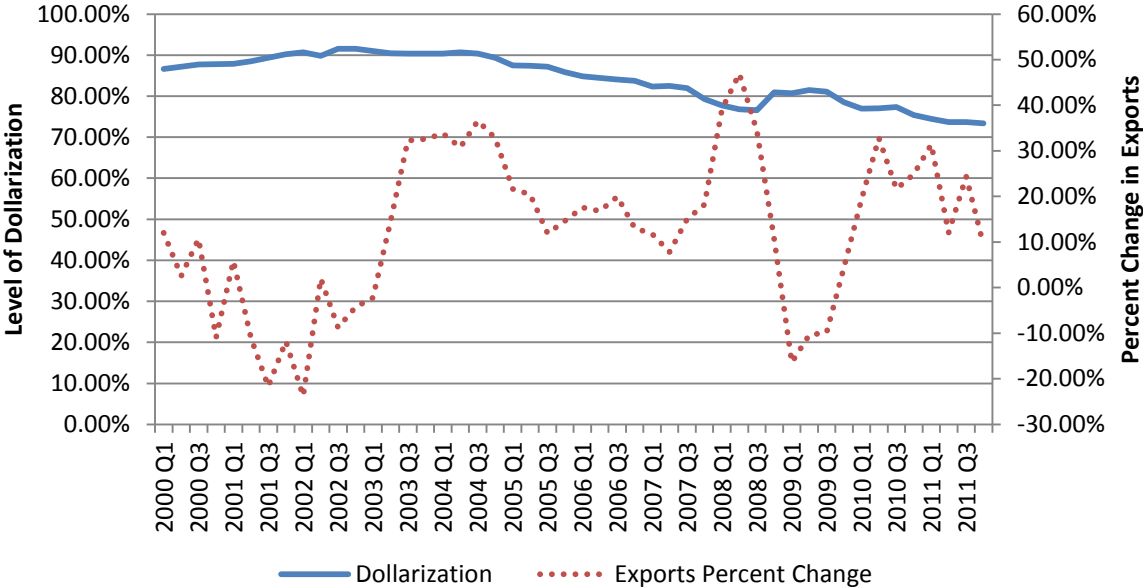
Figure 5.0 – Level of Dollarization in Uruguay
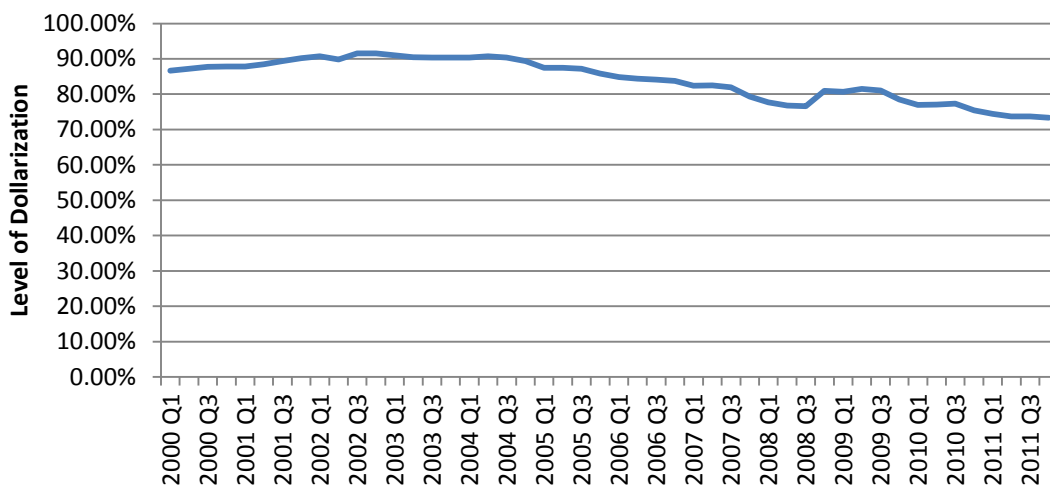
Uruguay has a reputation for being a prominent offshore banking center for Argentine and Brazilians. This reputation has been strengthened by Uruguay's lax banking laws and

reputation for stability. When Brazil and Argentina were facing economic crises, though still struggling, Uruguay didn't allow their deposits to be affected. This, along with their proximity and neutrality towards their neighbors, has earned them a reputation as a "safe haven" and popular offshore money destination.

A second likely reason to explain the historically high level of dollarization in Uruguay is their levels of exports. If we look at *figure 5.1* we see that the level of growth in exports have increased slightly over the past decade. This means that there is more foreign money coming into Uruguay to pay for exports and thus corporations are faced with the option of converting currency or retaining foreign currency for future business transactions.

Figure 5.1 – Dollarization versus Percent Change in Exports in Uruguay

With this said, they have decreased their level of dollarization by 14% since the start of the century. This is a substantial decrease which didn't happen without significant effort on the part of Uruguay. Much like Peru, Uruguay has targeted inflation as a key to de-dollarization and developed strategies to keep inflation below 10%. If we look at *chart 5.0,* we see that the first regression shows a statistically significant positive correlation between Uruguay's inflation level

and level of dollarization. This can also be seen in *figure 5.2*, where Uruguay greatly reduced

inflation from its peak in Q1 of 2003 and started to demonstrate more stability during the period

from Q3 2004 through the end of 2011.

Chart 5.0 – Regression Results for Uruguay

Variable	Coefficient	Standard Error	T-statistic	P>|t|
Regression: $d_t = \alpha + \beta_1(\pi_t) + \varepsilon_t$				
π_t	.3075928	.151313	2.03	.048
Constant	.8154899	.0151057	52.99	.000
Regression: $\Delta d_t = \alpha + \beta_1(\Delta \pi_t) + \varepsilon_t$				
$\Delta\pi_t$	.0092678	.0067365	1.38	.176
Constant	-.0040546	.0020195	-2.01	.051
Regression: $\Delta d_t = \alpha + \beta_1(\Delta \pi_t) + \beta_1(\Delta \pi_t) + \varepsilon_t$				
$\Delta\pi_t$	.0100084	.0077165	1.30	.202
$\Delta\pi_{t-1}$	-.001689	.0077163	-.22	.828
Constant	-.0042171	.0020833	-2.02	.049

**Figure 5.2 – Dollarization versus Inflation in Uruguay**

41
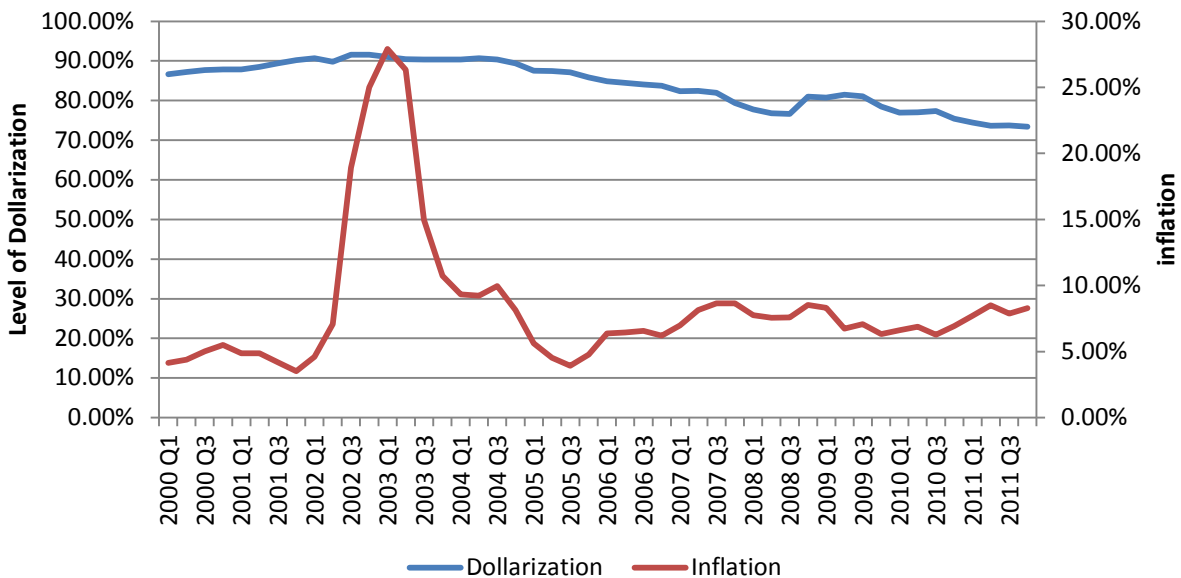
Not only has Uruguay targeted inflation, they have introduced different prudential measures to lower banks' incentives to borrow and lend in foreign currency, has raised provisions for foreign currency loans, and has tightened capital requirements against open foreign exchange positions. They too have used these policies to try and prevent lending and borrowing from occurring in foreign currency and transition it into Uruguayan Peso. Also similar to Peru, Uruguay has developed a capital market in local currency through the issuance of long-term public bonds in domestic currency. Uruguay has issued public debt in domestic currency with maturities over 10 years, the longest being up to 15 years. This has helped to create a capital market, and thus it is now easier to lend in domestic currency.

Additionally, a likely contributor to the reason that Uruguay has such a high level of dollarization is the way that they handled the crises that were occurring in their neighboring countries and within their own borders in recent years. Uruguay was facing strong economic pressures during the Brazilian crisis in the late '90s and the Argentine Debt Default and subsequent crises in the early 2000s. In 2000 Uruguay was also facing mounting debt and an increased debt burden. They however, didn't default on their debt and maintained consumer confidence in their commitment to pay their debt and honor their deposit commitments. This was a very different approach than that of Argentina who defaulted on their debt, limited customer withdrawals through the *Corralito*, and converted all U.S. dollar deposits to Argentine pesos through the *Pesification* program. Uruguay had no such program and ensured continuity to customers in terms of accessing their deposits in whatever currency the deposit was made. This stability has helped them to establish themselves as a secure country to do business with. This optimism can be seen through both their exchange rate and their increasingly growing GDP.

If we look at *figure 5.3* we see this how the level of dollarization compares with the

exchange rate. By the middle of 2002, after Uruguay experienced its banking crisis, we see that

the exchange rate, level of inflation, and level of dollarization appear highly correlated. This is

confirmed by the results that we found from regression 1. This also affirms the trend that we

have seen from Chile, Peru, and now Uruguay.

Figure 5.3 – Dollarization versus Exchange Rate in Uruguay

Dollarization level ——— National Currency per U.S. Dollar, period average ·····
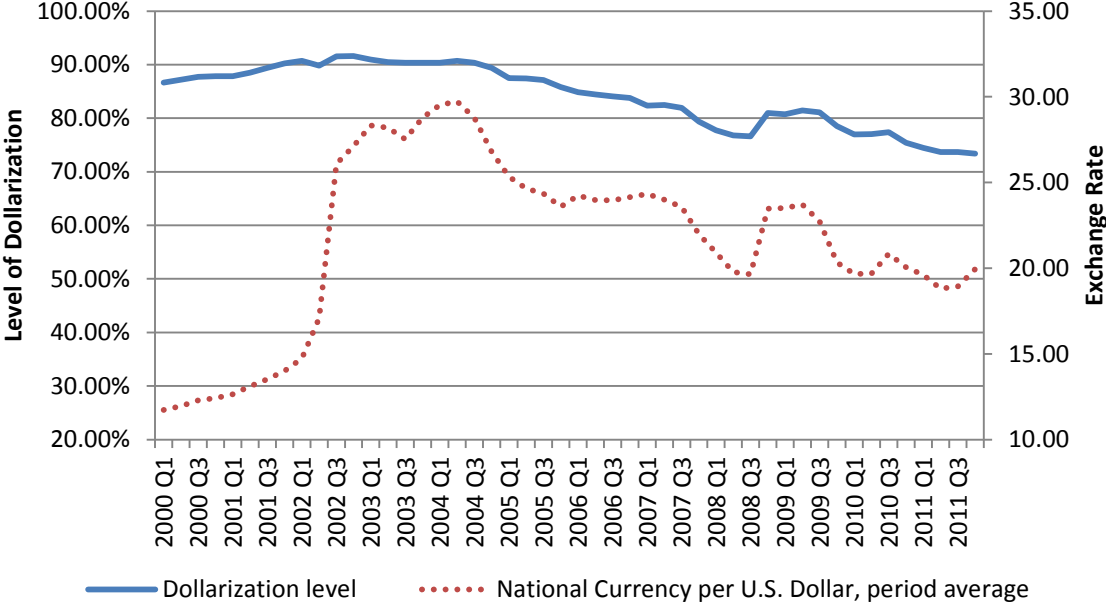
COMMONALITIES ACROSS COUNTRIES

As alluded to above, there appears to be a positive correlation between changes in

inflation and changes in the level of dollarization in Argentina, Chile, Peru, and Uruguay. Why

is it the case that these results are statistically significant in Argentina, but not as significant in

these other countries? There are some striking similarities that Chile, Peru, and Uruguay share

that Argentina does not. For instance, Chile, Peru, and Uruguay, have all experienced an

appreciation in their exchange rates. Additionally, these countries have faced generally

positively growing GDP, falling rates of unemployment, increasing levels of saving, and have all

dealt with their foreign debt obligations and have established credible capital markets. Argentina

43

on the other hand, has seen currency depreciation, is still dealing with their debt default of 2001, hasn't implemented strategies trying to curb the level of lending and deposits in dollars, and hasn't established a capital market. These characteristics mean that Argentina likely hasn't seen the end of the increase in level of dollarization.

There are many implications and potential factors as to why Argentina is so drastically different from the other countries in the study. One is that they face much more uncertainty than their neighbors. Argentina and Uruguay are the only countries in our study to have faced a significant economic shock that originated during the period from 2000-2011. The reason that the case of Argentina is so different from Uruguay is due to the government responses to these shocks. Uruguay did not default on their debt nor did they convert citizens' deposits from U.S. dollars to Uruguayan Pesos. This allowed them to recover fairly successfully from their shock and maintain consumer confidence. Inversely, Argentina defaulted on their debt and converted all deposits to Argentine Pesos. This greatly reduced consumer confidence in the government's ability to implement and maintain sound economic practices and questions their ability to respond to economic shocks. As a result, many Argentines now hedge the risk of a reoccurring economic shock by buying dollars (similarly to U.S. citizens investing in gold to hedge against uncertainty).

CONCLUSION

In examining the many different instances of dollarization that have occurred throughout parts of Latin America throughout the last century, a couple of things are clear. Firstly, inflation and the level of dollarization are positively correlated. Secondly, countries have the ability to take an active role to help control levels of dollarization.

With these conclusions drawn, dollarization is an important topic for further research as

there are many other relationships that were not uncovered with this analysis. There is a fair amount of work written concerning dollarization and countries motivation towards or against full or official dollarization. There is considerably less literature; however, concerning de-dollarization and the importance that de-dollarization has on a countries economic sovereignty and its ability to fully affect domestic economic change. Additionally, there is limited work concerning dollarization in the past decade. Much focus was given to the subject surrounding the Argentine proposal in 1999 to dollarize, but since then, there has been a considerable drop off in the amount of new materials produced. The findings of this study help to begin the examination of de-dollarization in Latin America, and I hope that economists will continue to examine this subject for additional relationships and develop additional policies to combat dollarization into the future.

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<div align="center">

ACADEMIC VITA of Robert B. Dewey
5606A Nittany Apartments State College, PA 16801
164 McKinnel Road, Highgate, VT 05459
rbd5021@psu.edu
(802) 309-5028

</div>

EDUCATION	**The Pennsylvania State University | Smeal College of Business** **University Park, PA**

The Pennsylvania State University | Smeal College of Business   **University Park, PA**
Bachelor of Science in Economics and International Studies   *Anticipated 5/12*
Minors: International Business and Spanish
- Schreyer Honors Scholar
- Dean's List, Fall 2008- present
- Economics Honors Program
- Early Enrollment Program
- Recipient of 11 Scholarships, including the IBM Thomas J. Watson Scholarship and the Samsung American Legion Scholarship

IES Abroad | Buenos Aires Program   **Buenos Aires, ARG**
Study Abroad   *8/10-11/10*

EXPERIENCE **Chatham Capital Advisors**   **Kennett Square, PA**
Real Estate Finance Intern   *6/11– 8/11*
- Produced offering memorandums for real estate worth upwards of one hundred million dollars
- Examined different sub markets and constructed models to appropriately value assets
- Analyzed government lease data to determine government renewal rates and occupancy statistics

Enterprise Rent-A-Car   **South Burlington, VT**
Management Trainee Intern   *5/10– 7/10*
- Achieved number one ranking of Northeastern region intern performance
- Produced strategies to increase customer satisfaction rates by 7%
- Assisted in expansion of fleet by more than a quarter of original size

Sheraton Burlington Hotel and Conference Center   **Burlington, VT**
Human Resources Intern   *5/09 – 8/09*
- Responsible for maintaining over 150 confidential personnel files
- Automated accounting and journal entry processes by developing record keeping and reporting tools in Microsoft Excel
- Created an employee feedback program to aid in managerial decision making

INVOLVEMENT **Smeal Student Society**   **University Park, PA**
Platinum Member/Director of Finances and Events   *9/08 - Present*
- Elected by peers to the position of Director of Finances and Events
- Adhere to university accounting guidelines for accessing funds
- Developed a mentoring program recognized as the "Most Innovative Program" by the college

Innovation and Quality Team
Accounting 211 Team Member/Marketing 221 Team Leader/Marketing 445 Team Leader   *9/09 - Present*
- Create innovative solutions to tie class material to student interests and industry expectations
- Serve as liaison between faculty and students, communicating concerns and suggestions for the course
- Work with professor to resolve concerns and integrate solutions into the curriculum

PROFICIENCIES Bilingual (English and Spanish), Microsoft Office (Access, Excel, Outlook, Publisher, Word)