ABSTRACT

Dollarization and Growth: A Synthetic Control Approach to Ecuador and El Salvador's Cases

Juan Yepes, M.S.Eco.

Advisor: A. Scott Cunningham, Ph.D

This thesis examines the impact of full dollarization on economic growth in Ecuador and El Salvador by employing the synthetic control method. We find that, relative to the counterfactual built, these currency substitutions had no effect on real income per capita. We use placebo exercises to explore the statistical significance of our results. We intend to determine the validity of the method to monetary substitution questions. This paper concludes that there is no causal relationship between dollarization and economic growth, but that better insight into a country's growth parameters can result in more robust findings.

Dollarization and Growth: A Synthetic Control Approach to Ecuador and El Salvador's Cases

by

Juan Yepes, B.A.

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Approved by the Thesis Committee

A. Scott Cunningham, Ph.D, Chairperson

Van Pham, Ph.D.

James Stamey, Ph.D.

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J. Larry Lyon, Ph.D., Dean

Page bearing signatures is kept on file in the Graduate School.

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CHAPTER ONE

Introduction

1.1 Overview

There are officially ten nations who have surrendered monetary control to the United States. However, the majority are islands or micro states with very unique cultural and economic conditions not suitable for substantive analysis [16]. Ecuador and El Salvador provide an ideal example of small emergent economies that are dollarized and integrated with global markets. Thus, their cases are better suited to study the feasibility and effectiveness of establishing the U.S. dollar as official currency. While the timing was similar, Ecuador dollarized in 2000 and El Salvador in 2001, the circumstances under which each of these countries dollarized were diametrically opposed. This poses the question of which conditions must truly be met in order for dollarization to become successful. This paper is a case study of Ecuador and El Salvador's economic performance after official dollarization was implemented.

Ecuador was amid one of the most tremendous economic crises in its history. With inflation reaching 96% in 1999, economic destruction of 7%, and a collapsed banking and financial system, then President Jamil Mahuad took the decision of adopting the dollar as official currency of the country in 2000 as a solution to these grim economic conditions. El Salvador, by contrast, was living under a period of economic and price stability, and adopted this new monetary arrangement in order to enhance its economic reform program that started after the end of the civil war [15]. In 2000, inflation was just above 2%, economic growth ran around 3%, and the financial system was regulated and stable.

Even though the circumstances under which both countries decided to dollarize were different, the rationale behind this extreme decision is the same. Expected policy implications and economic benefits of dollarizing include lower inflation and expected inflation, elimination of currency risk (which in turn brings a decline in country risk), fiscal discipline, integration with international markets, and overall policy credibility and confidence in the domestic banking system [15]. These traits trigger foreign investment, stable capital flows, better long term planning, and in general a more stable currency able to maintain its three fundamental roles: unit of account, store of value, and medium of exchange.

The decision to dollarize is the strongest commitment device in the monetary regime spectrum, therefore, it is a policy that is very costly, if not impossible to revert. The costs of abandoning a domestic currency in favor of a foreign one are loss of seignorage revenue and surrendering monetary policy, thus limiting the ability of the government to respond to negative economic shocks and act as lender of last resort. It is still widely discussed in the economic literature whether the benefits outweigh the costs, and to what magnitude they do.

The goal of this paper is to identify whether there is a true causal effect of dollarization on economic growth only, and quantify its size. Moreover, we may arrive at a better calculation of the benefits of this particular regime. The nature of these extreme interventions requires an econometric model that can handle non-randomness of the treatment, the lack of comparable units, a small sample and aggregate data [10]. A regression-based model would have difficulty managing these shortcomings and becomes unsuitable. Therefore, the synthetic control method (SCM) developed by Abadie and Gardeazabal (2003) is ideal because it provides a model for quantifying the size of the treatment effect as compared to appropriate counterfactuals or units. While there is an increasing number of papers using this approach for comparative case studies, the use of SCM for monetary regime questions is limited to

Hallren (2014), and his study of hard-peg regimes in Argentina and Ecuador on inflation and growth. This paper aims at using the method to build the counterfactuals in two different ways, which vary in complexity, with the goal of effectively modeling the synthetic unit. Abadie (2011) recommended the use of any of these processes for a study on Uruguay's foreign direct investment policies. We will closely follow his recommendations. An important question that follows is if SCM can answer monetary policy questions, like the effectiveness of dollarization, where the treatment unit has such unique idiosyncratic factors.

The rest of this paper proceeds as follows: Chapter Two briefly describes the historical aspects behind the dollarization process in Ecuador and El Salvador, and the literature review of dollarization impacting economic growth. Chapter Three introduces the research design, methodology, and data collecting process. Chapter Four applies the synthetic control method to Ecuador and El Salvador and presents the placebo tests and inferential techniques associated with SCM, as it is applied to our control units. Chapter Five discusses results and concludes.

CHAPTER TWO

Historical Background

2.1 Ecuador

Ecuador decided to formally dollarize in January of 2000 as an emergency response to the worst economic crisis in its history. Jacome (2004) attributes to a combination of weak institutions and fiscal rigidity the collapse of an already highly dollarized financial and banking system. During the 90's decade, external shocks such as the Tequila Crisis of 1994, the Asian crisis of 1997 and the decline of world oil prices aggravated the effects of this internal crisis and also played an important role in the general loss of confidence of domestic and international markets in Ecuador's financial system and in the sucre, its national currency. These factors led Ecuador to a triple banking, fiscal, and currency crisis, which has been estimated to cost 20% of GDP [13].

The 1990's represented a period of economic rebirth for many of the economies in Latin America. The introduction of liberalization and privatization ideas shaped the political arena in the early part of the decade. In Ecuador, the financial system became deregulated and the central bank started to assume only monetary functions, not supervisory ones. By 1998, the above mentioned domestic and foreign effects on the national economy began to cause political and social unrest. The sucre began its depreciation path, economic growth stagnated, the fiscal deficit widened, and interest rates rose above 100%. Jamil Mahuad became president.

By August of 1998, banks began to declare insolvency. The banking crisis spread throughout the system and affected large and small financial institutions alike. The rapid depreciation of the sucre was the first event that led to the announcement of official dollarization in Ecuador. The government desperately intervened to stop this imbalance by freezing bank deposits (locally known as Feriado Bancario, or banking holiday), which caused deep political and social instability. In addition, the government had to default on its external debt, amplifying the liquidity problems Ecuador faced. This series of events led President Mahuad to announce the country abandoned the sucre in favor of the U.S. dollar in order to solve the economic and banking crisis. This radical measure was unpopular and caused Mahuad's removal from the presidency shortly after the announcement.

Dollarization became effective in September of 2000, under Gustavo Noboa, Vicepresident of the nation, after Mahuad's deposition. He ratified the adoption of the U.S. dollar as legal tender in order to normalize economic activities, and as a full commitment to the new regime. Ecuadorian congress passed the Economic Transformation Law that set the standards for which the new monetary arrangement would be implemented and carried [13]. The central bank repurchased stock of sucres and bank accounts were converted into dollars at the fixed rate of 25,000 sucres per U.S. dollar. Expectations adjusted and inflation stabilized, eventually converging to US inflation rates. Ecuador has used the U.S. dollar as its official currency ever since.

2.2 El Salvador

After almost a decade of a fixed peg to the US dollar, El Salvador formally dollarized in January of 2001. Unlike the Ecuadorian case, this measure was not a last resort effort to save a collapsing economy. By the contrary, dollarization was part of a series of structural reforms implemented to enhance economic activity [15]. By eliminating currency exchange risk, dollarization represented a full commitment policy to investors. After the end of the civil war in El Salvador, policy makers set themselves to bring the country back to the global arena.

The 1990's represented a period of stabilization and moderate growth for the Salvadorian economy. Economic growth averaged around 3% and inflation was manageable close to 4% on average [14]. Moreover, before dollarization, the government installed a series of provisions with the goal of diversifying away from commodities and fostering price stability. Such regulations included a simplification of the taxing structure, trade liberalization, and privatization of the financial system [15]. Coupled with a fixed exchange regime to the U.S. dollar, El Salvador was on track to restore its credibility to international markets.

In November of 2000, congress approved the so called Monetary Integration Law (Ley de Integracion Monetaria) that declared the U.S. dollar legal tender, and set a fixed exchange rate of 8.25 *colones* per dollar to denominate all financial accounts and trades. The local currency would continue to circulate, but financial operations were to be carried only in U.S. dollars. This seemed to be the next logical step for the government in their efforts to promote economic growth and stability in their country. They argued that dollarization would also protect savings and wages against devaluations, and that remittances would be cheaper to send, favoring Salvadorians in the United States [15]. The law became effective on January 1st 2001.

2.3 Literature Review

The literature on the benefits and costs of dollarization is extensive and controversial. On one hand, some claim that there is little merit in surrendering a country's ability to print local currency. This ability has important implications for any government, specially in emerging economies, where big macroeconomic shocks are frequent. Seignorage revenue is often regarded as a powerful fiscal instrument, and is an important tool for raising money quickly when undergoing these shocks [5]. Thus, surrendering monetary policy can be costly if a country's economy is unable to react to negative economic environments. In addition, there are important implications for international trade and financial markets.

On the other hand, proponents of dollarization as a sound macroeconomic policy argue that having a dollarized economy brings big improvements in a country's credit worthiness [8]. It is also able to eliminate the possibility of currency crises [5], reduce inflationary pressures by bringing credibility to consumers and investors, and can increase international trade by reducing transaction costs given that the exchange rate is less volatile for a more credible currency [4]. Arellano and Heathcote (2007) also find that dollarization makes it easier for countries under this regime to access international credit markets.

However, there is little evidence that a dollarized economy has a higher growth rate than a non-dollarized economy, ceteris paribus. Edwards and Magendzo (2003), using treatment regression analysis, find that per capita GDP growth is not statistically different in dollarized and non-dollarized countries. Hallren (2014) finds similar results. The limited work on this topic might be explained by the difficulty of finding appropriate comparison units and the complexity of isolating or controlling the various factors that account for economic growth.

CHAPTER THREE

Methodology:Application of the Synthetic Control Method

This section covers the specifics of this paper's implementation of SCM to dollarization and economic growth in Ecuador and El Salvador.

3.1 Data Description

We built a cross-country annual panel from 1980 to 2013 using the World Bank's World Development Indicators and Barrow & Lee's database. The time horizon consists of approximately 20 years prior to the intervention, and 13 years post-treatment. The latter window is large enough for local and foreign economic agents to adapt to the new policy. We used a set of economic growth predictors: Foreign Direct Investment (FDI), Gross Capital Formation (GCF), years of secondary schooling (SCH), population density (pop dens), urban population (URB), and trade openness (Trade). In addition, we gathered values of our outcome of interest, per capita GDP (base year=2005).

Our goal is to find a group of weighted units whose path best replicate the pre-treatment trajectory of our variable of interest for the treated country. Our donor pool consisted of 42 countries of middle-low income, and within certain geographical latitudes with similar characteristics to Ecuador and El Salvador, our affected units. We applied the synthetic control model to both units individually, and thus had to create subsets of the donor pool to avoid including countries that could be directly or indirectly affected by the intervention. In this case, dollarization is common to Ecuador, El Salvador and Panama, and so for Ecuador's model we excluded the other two. Indirect impact, or spillover effects, must also be accounted for. Table 3.1 shows the biggest trade partners of Ecuador. These countries were also excluded from the donor pool because the dollarization episode potentially affected their per capita GDP, and thus become unsuitable for appropriate analysis of the intervention in Ecuador. We applied the same rationale to El Salvador. Table 3.1 also shows El Salvador's most important trade partners.

Table 3.1. Trade partners

Ecuador	El Salvador
United States	Nicaragua
Colombia	Guatemala
Peru	Honduras
Panama	Costa Rica

Table 3.2 presents all the countries in the donor pool for both Ecuador and El Salvador's model prior to applying the method.

Table 3.2. Donor Pool

Argentina	Angola	Algeria	*Nicaragua*	Bhutan
Bolivia	*Colombia*	Botswana	Cabo Verde	*Guatemala*
Cameroon	Cote d'Ivoire	Congo	*Peru*	*Honduras*
Panama	*Costa Rica*	Dominican Republic	Fiji	Papua
Gabon	Venezuela	Guyana	Jamaica	Mexico
Morocco	Nigeria	Thailand	Senegal	Paraguay
Philippines	Samoa	Namibia	Sudan	Suriname
Ghana	Yemen	Vietnam	Tunisia	Zambia

3.2 Method

For simplicity, we describe the process for Ecuador as the treated unit only. The model is applied identically to El Salvador's case. We applied SCM to study the impact of full dollarization on economic growth as measured by the trajectory of per capita GDP over the time horizon of study.

Abadie, Diamond, and Heinmuller (2012) describe the synthetic control method (SCM) as one that would bring quantitative rigor to qualitative analysis. This type of research design is ideal for comparative case studies where the treatment is a non-random event that affects a single, aggregate unit like a country. Because it is hard, if not impossible, to find a single non-affected unit that has the same characteristics as the treated one, SCM systematic approach provides an ideal framework for selecting an appropriate comparison unit that allows proper analysis. This systematization also gives place to precise statistical inference.

There are $J+1$ countries in our data set, indexed by j. Ecuador is the treated unit $j = 1$, and our potential comparison countries forming the donor pool are $j = 2$, $j = 3$,..., $j = J + 1$. The process of selecting the donor pool is described in the previous subsection. We select a sample over T years, divided into two periods: the pre-intervention period T_0, and the post-intervention period T_1. Then, $T = T_0 + T_1$. Our goal is to measure the effect of the intervention on our outcome of interest during the post-intervention periods. In other words, we want to compare Ecuador's actual per capita GDP path after dollarization to the path of a synthetic Ecuador that is the same in every aspect we selected except for being dollarized. SCM builds the synthetic Ecuador as a weighted combination/average of untreated units in our donor pool. We get a Jx1 vector of weights $W = (w_2, w_3, \ldots, w_{J+1})'$ with two crucial restrictions set by Abadie et.al (2012):

(1) $0 \leq w_j \leq 1$ for $j = 2, ..., J+1$

(2) $w_2 + w_3 + \ldots + w_{J+1} = 1$

Every different value of W is a different synthetic Ecuador. Thus, we will select the value of W such that the characteristics of Ecuador and the synthetic Ecuador match as closely as possible. We will employ 2 different ways to get the best value of W that meets this criteria. We use k covariates that we deemed had a large predictive power of per capita GDP. These are listed in the Data Description subsection above. These are the pre-intervention characteristics of the treated unit that we expect to replicate. A kx1 vector X_1 contains the values of such covariates for Ecuador. A kxj matrix, X_0, contains the values of the same covariates for the units in our donor pool. We then solved the following optimization problem, where X_{1m} is the value of the mth covariate for the treated unit, and X_jm is the value of the mth covariate for country j from t to T_0:

$$\min_{w} \sum_{m=1}^{k} v_m (X_{1m} - \sum_{j=2}^{J+1} w_j X_{jm})^2$$

The solution to this problem gives the vector W^*, $w_2^*, w_3^*, \ldots, w_{J+1}^*$, that represents the best fit synthetic control. We obtained a proper counterfactual to draw comparisons with Ecuador's actual economic performance. The value v_m reflects the relative importance given to the mth covariate when measuring the discrepancy $X_1 - WX_0$. v_m can be a subjective measure, a regression-based measure, or a cross-validation result. We let Y_{jt} be the outcome of interest, per capita GDP, of unit j at time t. We get a T_1x1 vector with the post-intervention values of Y_1. Y_0 is a T_1xJ matrix that stores the post intervention values of per capita GDP for units $j = 2, \ldots, J+1$. The synthetic control estimator of the effect of the treatment is then:

$$\hat{\alpha}_{1t} = Y_{1t} - \sum_{j=2}^{J+1} w_j^* Y_{jt}$$

A significant gap is a first-step assessment of the effect of the intervention on the treated unit. If $\hat{\alpha}_{1t}$ is large enough, we make a first guess that dollarization had an effect, positive or negative, in Ecuador's per capita GDP, as compared to its synthetic counterfactual.

3.3 Inference

Abadie, Diamond and Heinmuller(2012) also explain how useful the synthetic control method is for proper statistical inference. By systematizing the way one chooses the comparison units, it is possible to run a series of falsification exercises, or placebo tests, to check the significance of the results obtained when applying SCM to the unit of interest. There are two kinds of placebo tests: in-space and in-time. In-space falsification means that we run the model with an assigned unit from the donor pool, one not affected by the intervention. We can run this for every unit in the donor pool, and obtain a distribution of placebos with which we will compare the trajectory of the variable of interest for the treated unit. If the estimated effect of the intervention fell inside the distribution, our confidence that there is a causal relationship will be diminished. On the other hand, in-time falsification requires shifting the year of the treatment to a different time, and observe whether there are any differences with the original model [1]. In this paper we rely on in-space placebos as our method of inference.

In addition, we rely on p-values to quantify the difference between the original synthetic control estimate and the artificially generated distribution of placebos [1]. Abadie et al (2012) say "the p-value still has an interpretation as the probability of obtaining an estimante at least as large as the one obtained for the unit representing the case of interest when the intervention is reassigned at random in the data set." Recall that our goal here is to determine whether the results obtained using SCM are statistically significant.

The p-values are calculated as the ratio of the pre-treatment RMSPE to the post-treatment RMSPE, where

$$RMSPE = (\frac{1}{T - T_0} \sum_{t=T_0+1}^{T} (Y_{1t} - \sum_{j=2}^{J+1} w_j^* Y_{jt})^2)^{1/2}$$

We will develop a histogram of p-values to compare Ecuador's and El Salvador's results to the distribution of placebos for each in the next section.

CHAPTER FOUR

Results

4.1 Synethic Control Estimates

The solution to the optimization problem presented in the previous chapter is a set of weights of the control units that create the synthetic control. Recall that SCM attempts to build counterfactual that matches on pre-intervention variables, and that allows proper comparison to the treated unit. A comparison table of matching variables is presented below. More importantly, it determines whether dollarization has a true causal effect on real income for Ecuador and El Salvador. The next subsections describe the results obtained.

4.1.1 Synthetic Ecuador

The countries that make up the synthetic Ecuador are given in Table 4.1. These countries were *a priori* expected to form the synthetic control given some similarities with Ecuador's economy.

Table 4.1. Ecuador's synthetic control weights

Country	Weight
Algeria	0.337
Argentina	0.119
Bolivia	0.096
Botswana	0.058
Nigeria	0.247
Venezuela	0.145

The rest of the countries in the donor pool were estimated a weight of 0, and thus are not included as part of the synthetic control. These results mean that a weighted combination of the countries in Table 4.1 are the best pre-intervention fit of Ecuador's real income path. Figure 4.1 shows the comparison between per capita

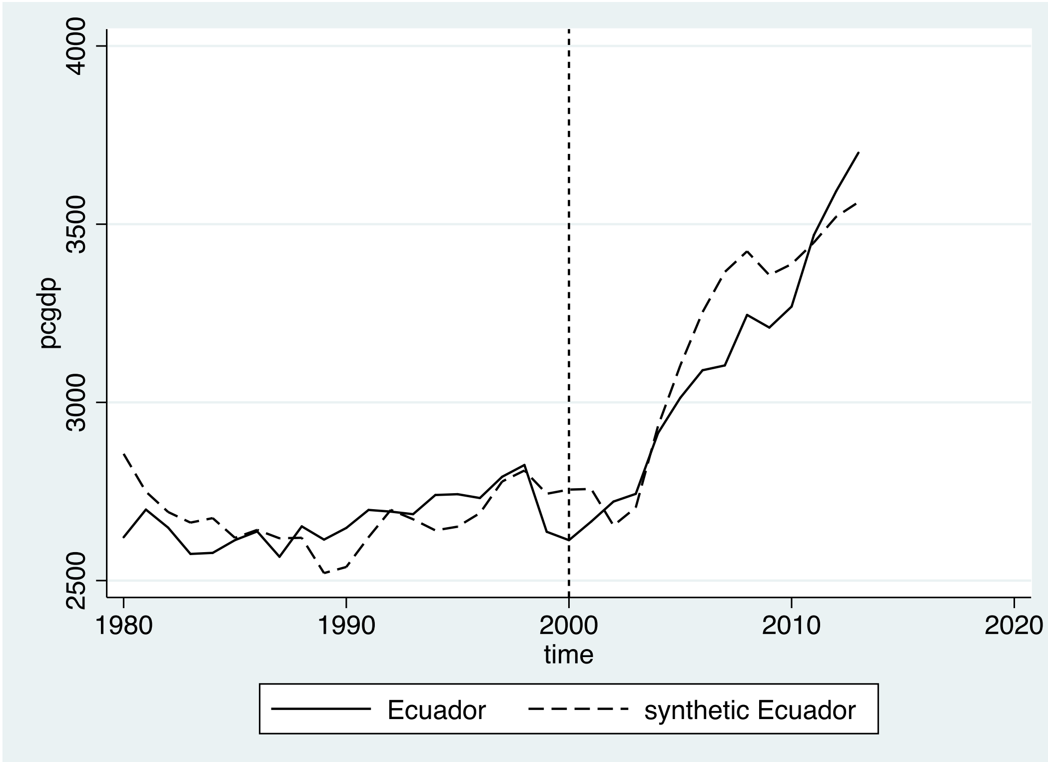

Figure 4.1. Per capita GDP path: Ecuador vs. synthetic Ecuador

GDP for Ecuador(solid line) and its synthetic counterpart (spaced line) which did not dollarize.

The vertical dotted line at year 2000 represents the intervention period. The model does a fair job replicating the pre-treatment path. The synthetic control was unable to replicate Ecuador's economy collapse of 1999. That explains the gap observed at the treatment line. After dollarization, there appears to be periods where the synthetic Ecuador performs better, but no real sign of divergence between the dollarized country and its counterfactualt. In other terms, $\hat{\alpha}_{1t}$ appears to be close to 0, on average. Before performing any inference testing, Figure 4.1 shows there is little evidence of a causal effect. In Figure 4.2, we can observe the magnitude and sign of the gap. In addition, Table 4.2 presents the values of the control variables we attempt to match prior to the intervention. These values should be as equal as possible to demonstrate a good fit of the SCM.

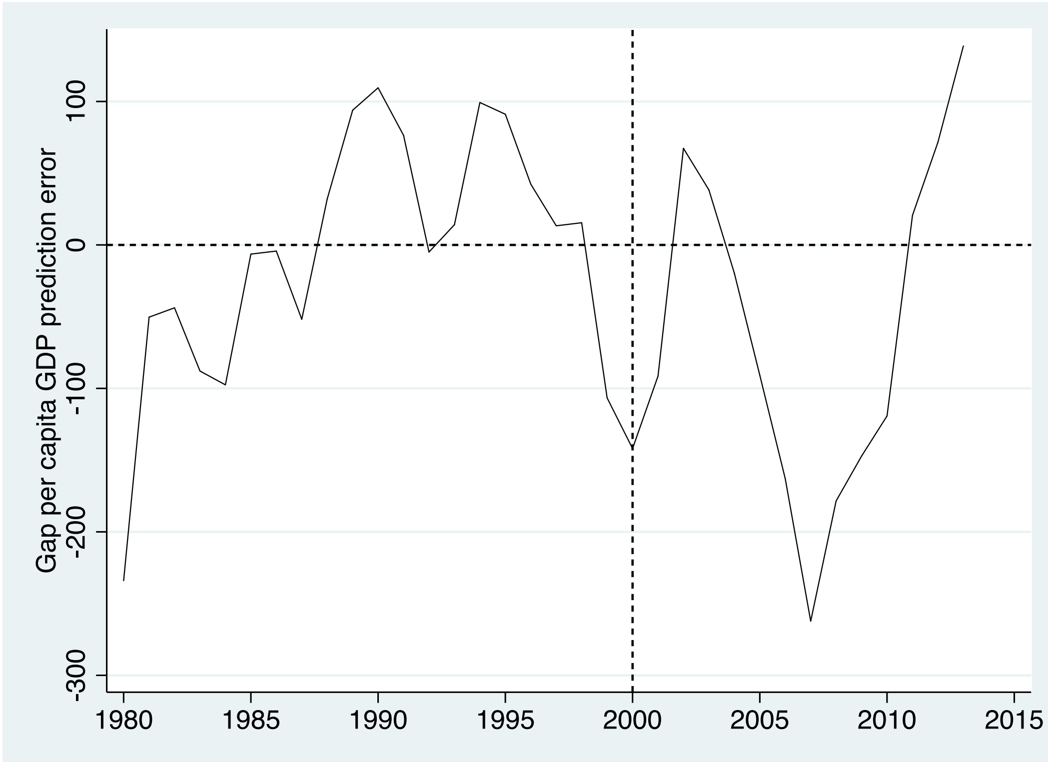

Figure 4.2. Per capita GDP gap between Ecuador and its synthetic counterpart

Table 4.2. Matching parameters: Ecuador vs. Synthetic Ecuador

Variable	Treated	Synthetic
Foreign Direct Investment	1.3086	1.6652
Gross Capital Formation	22.3494	22.3872
Population Density	36.7547	34.8142
Years of Schooling	14.68	12.99
Exports (% of GDP)	19.4787	25.7079
Imports (% of GDP)	20.7666	22.9350
Urban Population	54.1269	54.2667
Per Capita GDP: Year 1985	2613.5630	2619.9450
Per Capita GDP: Year 1992	2693.4440	2698.3760
Per Capita GDP: Year 1999	2636.8990	2743.5290

4.1.2 Synthetic El Salvador

The countries that make up the synthetic El Salvador are given in the following table:

Table 4.3. El Salvador's synthetic control weights

Country	Weight
Argentina	0.214
Dominican Republic	0.328
Vietnam	0.458

Unlike Ecuador's case, only three countries had positive weights, and they form El Salvador's synthetic control. Figure 4.3 shows the comparison between El Salvador (solid line) and its synthetic counterfactual (spaced line).

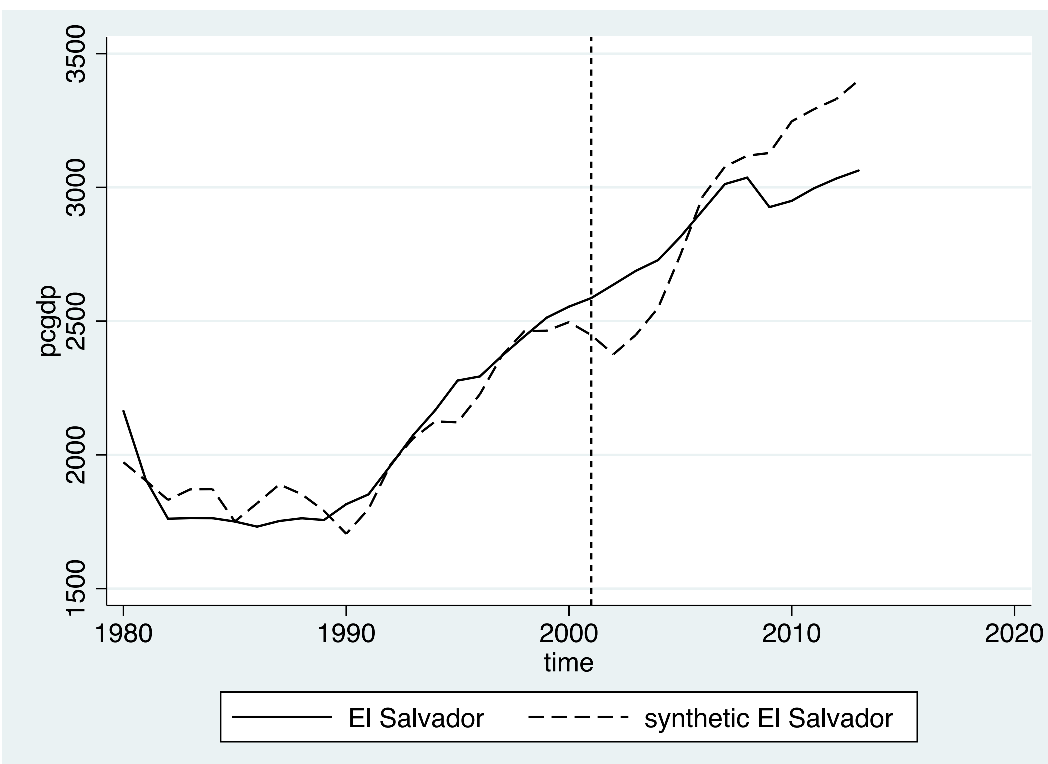

Figure 4.3. Per capita GDP path: El Salvador vs. synthetic El Salvador

El Salvador officially dollarized in 2001, which is represented by the dotted line at that year. Similarly to Ecuador, the model does a fair job replicating the pre-intervention path of real income per capita, and there is little evidence that dollarization had any sustained effect on El Salvador's growth. Figure 4.4 graphs the gap between the treated and synthetic lines, and it is clear that after the intervention, El Salvador experienced a higher per capita GDP for the first 6-7 years, but then the synthetic would have performed better after 2008.

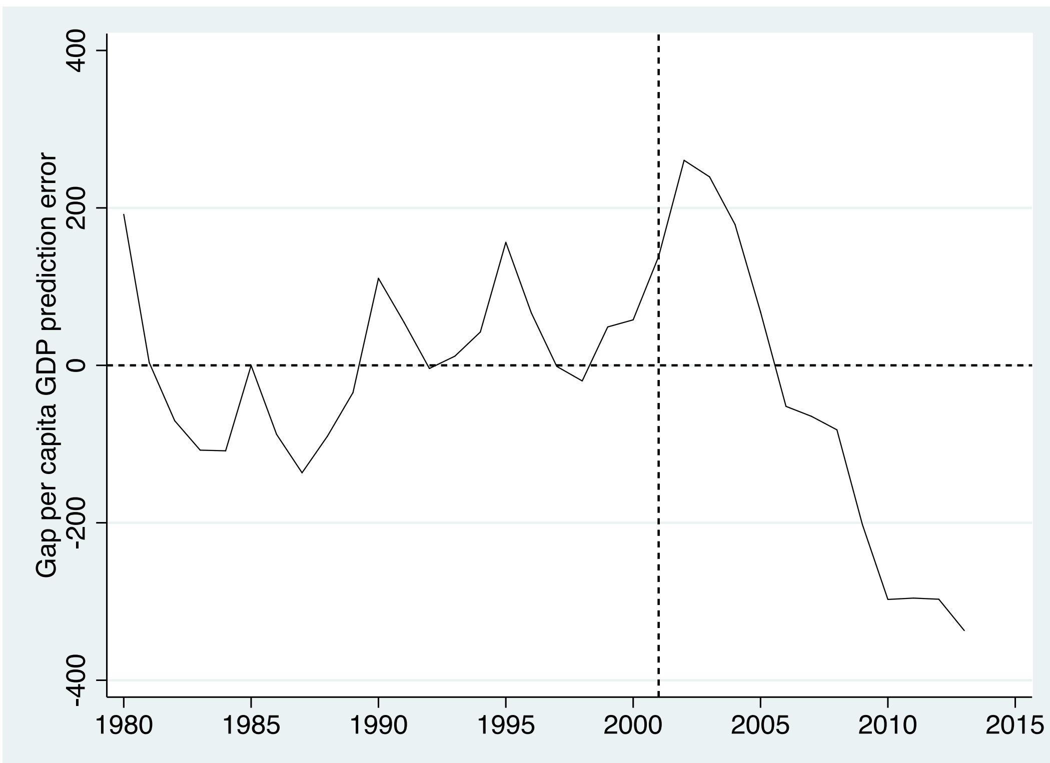

Figure 4.4. Per capita GDP gap between Ecuador and its synthetic counterpart

Table 4.4 presents the values of the control variables we attempt to match prior to the intervention. These values should be as equal as possible to demonstrate a good fit of the SCM. Although population density shows a big difference between the treated and the synthetic, we decided to include it because it resulted in the best fit out of the different variables we chose to model El Salvador's real income path.

Table 4.4. Matching parameters: El Salvador vs. Synthetic El Salvador

Variable	Treated	Synthetic
Foreign Direct Investment	0.8300	2.9639
Gross Capital Formation	15.0787	20.6246
Population Density	258.3968	144.3652
Years of Schooling	6.30	10.19
Exports (% of GDP)	21.9909	26.0820
Imports (% of GDP)	32.1093	31.7083
Urban Population	50.3785	46.4339
Per Capita GDP: Year 1985	1750.7460	1750.8920
Per Capita GDP: Year 1992	1960.9240	1964.9170
Per Capita GDP: Year 2000	2554.0490	2496.237

4.2 Placebo Tests

We now explore how significant are the results obtained in the previous section. With this purpose, we explore the two different measures of statistical inference used for SCM: placebo distributions and p-values.

Figure 4.5 graphs the placebo test distribution for Ecuador's dollarization case. We test statistical significance by evaluating how the evolution of the treatment effect for the treated unit is compared to the gaps generated by SCM for all other units in the donor pool. If Ecuador's gap, $\hat{\alpha}_{1t}$, lies within the distribution, we are less confident that our hypothesis of a significant treatment effect on the treated unit is true. Given that our graph in figure 4.1 was already a first sign of no real effect of dollarization in Ecuador's economic growth, figure 4.5 confirms this intuition. In addition, we also rely on p-values to quantify the results obtained from the placebo test graphs. Recall that a p-value is the ratio of post-to-pre treatment RMSPE, where RMSPE is described in the previous chapter. We build a histogram of ratios for all our units, Figure 4.6, and compare it to Ecuador's location in the distribution. Ecuador's ratio was 1.4, well within the distribution, and this allows us to conclude that our findings are not statistically significant.

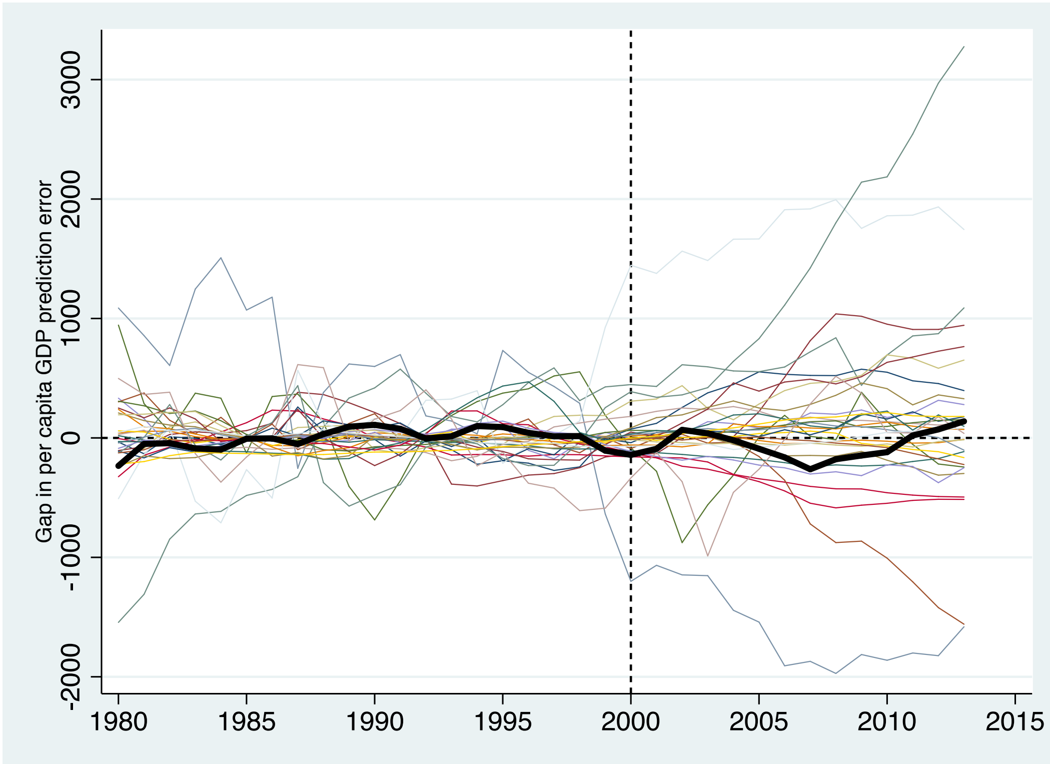

Figure 4.5. In-space placebo test across all units in the donor pool- Ecuador

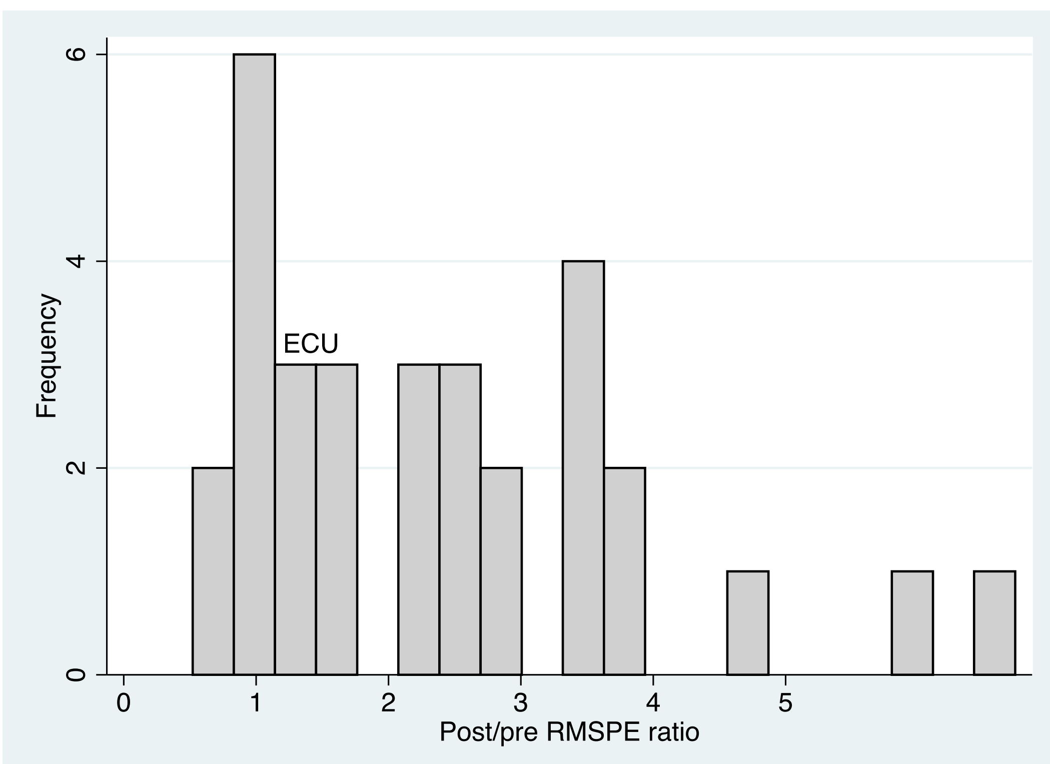

Figure 4.6. Post/pre-treatment RMSPE Histogram Distribution for Ecuador's case

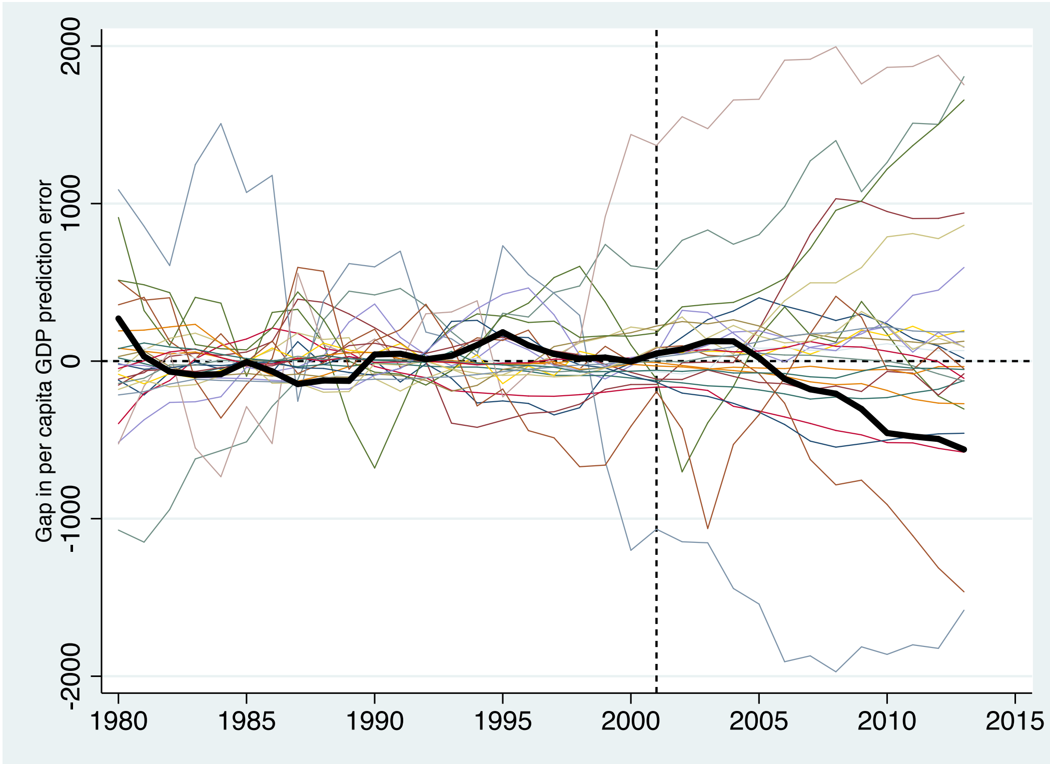

Figure 4.7. In-space placebo test across all units in the donor pool- El Salvador

Similar analysis is carried for El Salvador's dollarization study. Figure 4.7 presents the distribution of placebos. Just like before, if El Salvador's gap lies within the distribution, we fail to reject our hypothesis of a true causal effect of dollarization on economic growth. As observed in this graph, El Salvadors gap lies within the distribution, just like Ecuador's case. We again confirm our initial guess from the results section that our findings are not statistically significant. We also develop a histogram of ratios for El Salvador, figure 4.8, and observe a similar location to that of Ecuador's, although less centralized.

Ecuador's p-value is 0.4 and El Salvador's is 0.17. If we interpret this as any other p-value, it is clear that they are not significant even at the 10% level.

A final remark about p-values must be stated. For precise statistical reasoning, see Abadie et.al (2012). In this paper, we rely on the same logic for statistical significance used in previous comparative case studies that have used the synthetic

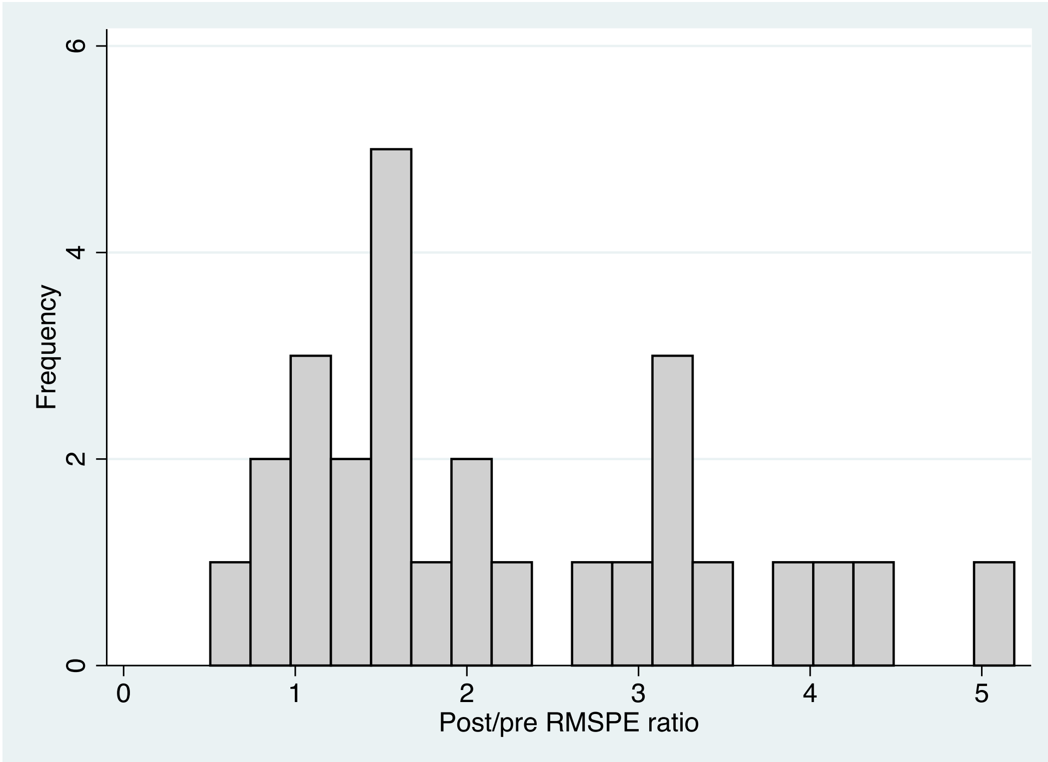

Figure 4.8. Post/pre-treatment RMSPE Histogram Distribution for El Salvador

control method. The histograms presented above show relative rankings of how well the synthetic control for our units of interest compared to placebo units. Unlike other more classic approaches to statistical significance, the falsification exercises employed here create a unique distribution.

CHAPTER FIVE

Discussion

5.1 Conclusion

For both Ecuador and El Salvador, we find no causal effect of dollarization on economic growth. These findings imply that the growth experienced after their dollarization episodes is not attributable to changing their currency, but rather to other internal and external factors, such as changing productivity or increasing prices of commodities. We observe positive and negative effects post-treatment, but using placebo tests as inferential techniques, we determine that such effects are not statistically significant. Furthermore, we see potential improvements to our analysis by altering the variables to be matched using the synthetic control method. We chose a set of standard economic growth predictors, but a more profound study of each country's idiosyncratic factors might lead to more robust results. Since we also wanted to compare whether the conditions before dollarization had a lasting effect in the results of the policy intervention, we wanted to standardize our study as much as possible. Obviously, we could not conclude anything on this issue either.

5.2 Policy Implications

This findings by no means imply that dollarization was a costly or erroneous experiment in Ecuador and El Salvador. It only finds that there is no causal effect between economic growth and the choice of a hard-peg exchange regime. From our study, dollarization has no positive or negative effect on economic growth, but certainly has an impact on other variables that affect a country's economic stability. The choice of currency should assess the costs and benefits.

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