Dollarization and Macroeconomic Stability in Latin America

Sofia Castillo, author
Dr. Marianne Johnson, Economics, faculty adviser

Abstract:

This paper examines if dollarization has had a positive impact on the macroeconomic stability of Latin American countries. Dollarization refers to either the official or unofficial replacement of local currencies with the U.S. dollar. Currently four Latin American countries are officially dollarized and the rest experience varying levels of unofficial dollarization. Data from the World Bank World Development Indicators for 21 Latin American countries from 1960 to 2003 are analyzed. To test the claim that dollarization improves macroeconomic stability, we construct a new measure of dollarization. Statistical analysis shows that increased dollarization is positively associated with economic growth. Dollarization has a stronger impact on inflation. Data suggests that dollarization significantly reduces inflation. This research has serious implications for the Free Trade of the Americas Association (FTAA) and suggests economic and development gains would come with a single currency union for the Western Hemisphere.

Introduction

In 2000, Ecuador disbanded its national currency and declared the United States dollar legal tender. While this is one of the more dramatic examples, most Latin American countries have come to use the U.S. dollar for at least some monetary transactions. "Dollarization" refers to the replacement of local currencies with the U.S. dollar in both local and international monetary transactions. Full or official dollarization occurs when a country completely gives up its national currency and instead adopts the U.S. dollar as its official unit of currency. Partial or unofficial dollarization occurs when countries allow the use of foreign currency deposits in domestic banks (Reinhart, Rogoff, Savastano 2003) and individuals use the foreign currency to make local transactions and/or allocate their financial assets (Quispe-Agnoli 2002).

While new, the study of dollarization is increasingly important as many countries have or are considering moving toward being officially dollarized economies. Panama has been officially dollarized since 1904, whereas Ecuador, El Salvador and Guatemala have only recently become fully dollarized—Ecuador in 2000, and El Salvador and Guatemala in 2001. Bolivia, Uruguay, Nicaragua and Peru are unofficially dollarized countries (Quispe-Agnoli 2002). Dollarizing the economy helps attract foreign investment and lowers interest rates (Campbell 2003). Dollarization also makes trade easier, especially for the small countries in Central America, for whom the United States is a major trading partner (Economist, 2001). Many economists believe it is the only way to achieve economic stability in Latin American countries.

Empirical studies on this matter have not been numerous, but most tend to measure dollarization with the ratio of foreign currency deposits to broad money (M3). For this paper, we adopt this measure of dollarization. Numerous macroeconomic indicators from 21 different Latin American countries for the years 1960 and 2002 are used to determine the impact of dollarization on the economies. Multivariate

econometric analysis indicates that dollarization has brought greater economic stability (low inflation rates) and economic progress (economic growth) to Latin America. The results are important for policy questions such as: whether the phenomenon of dollarization is expected to have a long-run positive impact on the Ecuadorian economy, or whether the U.S. and Latin American countries should consider a single currency union, similar to that of the European Union.

Literature Review

After two years of extreme monetary crisis, the president of Ecuador, Jamil Mahuad, announced on January 9th of 2000, a change from the local currency, the sucre, to the U.S. dollar. The sucre had lost more than 70% of its dollar value in the last twelve months, interest rates skyrocketed, and unemployment and poverty increased rapidly. The economy was on the verge of suffering hyperinflation and a hyper-recession. Following the example of Panama, where dollarization has had a positive effect, Ecuador decided to adopt the U.S. dollar as its national currency (Berg, Borensztein, Mauro 2003). Dollarization is generally believed to lead to more stable exchange and interest rates, as well as lower transaction costs for international corporations doing business in Latin America. This encourages international investment and promotes economic growth and development. There are also many disadvantages to dollarization which include the loss of monetary policy and the decline of national identity (Katz 2000, Jameson 2003). Many Latin American countries have considered dollarizing. Current candidates are: Argentina, Peru, the Dominican Republic, Mexico, Venezuela, and Guatemala. What stops these countries from dollarizing is that this strategy is very high-risk and requires an open, highly competitive economy that will commit to rigorous fiscal policies (O'Brien 2001). Moron and Winkelried (2005), for example, find that inflation targeting policies are compromised in highly dollarized economies.

Dollarization is a relatively new phenomenon, a product of looser capital flows and growth of electronic banking. Countries that continue to use their national currency find that more and more transactions are conducted in dollars (Jameson 2003, O'Brien 2001). To date, there have been only a handful of studies that examine whether increased dollarization is linked to greater financial stability and economic growth, despite the practical policy importance of the question. Readers are referred to Jameson (2003) for a brief survey of the literature.

The definition of dollarization varies among different authors, but most define it generally as the use of an "advanced" nation's currency as a legal tender; however, measuring dollarization proves difficult. Edwards and Magendzo (2001) focus on analyzing whether dollarized economies have had lower inflation rates, higher and faster Gross Domestic Product growth rates, and less macroeconomic instability, as measured by how volatile GDP growth rates are. They use data from various dollarized, independent countries and non-independent territories (which include territories, colonies or regions within a national entity) that were dollarized at some point between the years 1970 and 1998. By comparing the mean and median values of inflation, per capita GDP growth, and volatility of growth of dollarized nations (both groups included) to the mean and median values of non-dollarized nations (the control group), Edwards and Magendzo found that inflation in dollarized countries was statistically

significantly lower than inflation in non-dollarized countries, while per capita GDP growth was significantly lower. They found mixed results for growth volatility.

Since many dollarized economies are very small and extremely open, while non-dollarized economies are much larger and not as open, their first comparison could have generated biased results. For this reason, Edwards and Magendzo (2003) correct for bias using a matching estimators technique. Edwards and Magendzo use three different methods to achieve the comparisons for the matching estimators technique: (1) propensity score, (2) simple-average nearest neighbor estimator, and (3) local linear regressions. Using these three methods for the matching estimators technique, Edwards and Magendzo found slightly different results from their raw comparisons. They found that inflation rate is significantly lower in dollarized countries compared to non-dollarized countries. They also found that dollarized economies have a significantly lower per capita GDP growth rate than non-dollarized economies, but they found no statistical significance in the difference of the velocity of growth between dollarized and non-dollarized countries.

Compared to these previous studies that focused on dollarized countries (Edwards and Magendzo 2001 and 2003, Minda 2005, Moron and Winkelried 2005), this study uses an expanded data set that includes all Latin American countries, including countries that are officially dollarized and highly dollarized, as well as those with limited dollarization. This approach offers a broader opportunity to assess the macroeconomic impacts of a range of dollarization practices.

The Data

To assess the impact of dollarization, we constructed a panel data set of macroeconomic variables for 21 Latin American countries for the years 1960 to 2003. Data was collected from World Bank's World Development Indicators (www.worldbank.org/data/), which in turn gets its data from various sources, such as the International Monetary Fund, International Financial Statistics, OECD National Accounts data files, Government Finance Statistics Yearbook, and Global Development Finance. We included data on Gross Domestic Product (GDP), inflation, exchange rates, interest rates, unemployment, wages, trade deficits, direct and indirect foreign investment, financing from international monetary organizations, and economic growth. The definitions of these variables used in the analysis can be seen in Table 1.

The data in the World Bank Web site also included the monetary measures of M1 and M2. M1 is the currency outside banks, traveler's checks, and demand deposits other than those of the central bank; it is the most liquid forms of money. M2 is the currency outside banks, demand deposits other than the central bank, and the time, savings, and foreign currency deposits of resident sectors other than the central government; M2 is M1 plus quasi money. A more broad measure of money is M3, which includes currency deposits of the central bank, plus transferable deposits and electronic currency, plus time and savings deposits, foreign currency transferable deposits, certificates of deposit, and securities repurchase agreements, plus traveler's checks, foreign currency time deposits, commercial paper, and shares of mutual funds or market funds held by residents. The World Bank data set did not include this measure; therefore, we created a measure of quasi-liquid liabilities as a percentage of GDP plus M1 to obtain M3.

We also had to construct a measure of *dollarization*. Our approach is based on the methodology of previous studies (Edwards and Magendzo 2001, Moron and Winkelreid, 2005). However, it differs in two respects: (1) it is based on different data, and (2) we use a slightly different method for determining the amount of foreign currency in circulation. While we cannot determine the actual amount of foreign currency in circulation, we rely on a calculation of quasi money—time, saving, and foreign currency deposits by resident sectors other than the central bank. Dollarization is then defined as quasi money as a percentage of M3.

Table 1. Description of the Variables

CPI	Consumer Index Price, based on 1995 (1995 = 100). Reflects the changes in the cost to the average consumer of acquiring a fixed basket of goods and services.
Net Trade (millions)	Equal to total exports minus total imports
GDP growth	Gross domestic product growth, the one-year rate of growth in real gross domestic product.
Real Interest Rates	The lending interest rate adjusted for inflation as measured by the GDP deflator.
Unemployment (% of total labor force)	The share of the labor force that is without work but available for and seeking employment.
Wages (% of total expenditure)	All payments in cash to employees in return for services rendered, before deduction of withholding taxes and employee contributions to social security and pension funds.
Inflation (consumer price, annual %)	Measured by the consumer price index, reflects the annual percentage change in the cost to the average consumer of acquiring a fixed basket of goods and services.
Financing from Abroad (% of GDP)	Refers to the means by which a government provides financial resources to cover a budget deficit or allocates financial resources arising from a budget surplus. It includes all government liabilities or claims on others held by government and changes in government holdings of cash and deposits.
Foreign Direct Investment, net inflows (% of GDP)	Sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital.
Money, M1 (billions current LCU)	The most liquid forms of money; it consists of currency in the hands of the public, travelers checks, demand deposits and the deposits against which checks can be written.
Money & Quasi Money (% of GDP)	Money and quasi money is frequently called M2. Here, measured as a percentage of the gross domestic product.
Quasi Money (billions current LCU)	Time, savings, and foreign currency deposits of resident sectors other than the central government.
Money & Quasi Money Growth (annual %)	The change in the money supply is measured as the difference in end-of-year totals relative to the level of M2 in the preceding year.
Quasi Liquid Liabilities (% of GDP)	The sum of currency and deposits in the central bank (M0), plus time and savings deposits, foreign currengy transferable deposits, certificates of deposit, and securities repurchase agreements, plus travelers checks, foreign currency time deposits, commercial paper, and shares of mutual funds or market funds held by residents. They equal the M3 money supply less transferable deposits and electric currency (M1).
Net Income from abroad (current US$) (billions)	Includes the net labor income, which covers compensation of employees paid to nonresident workers; and net property and entrepreneurial income, which covers investment income from the ownership of foreign financial claims and nonfinancial property income.

Summary statistics for the key variables of the model are provided in Table 2. Latin American countries average GDP growth of 3.65% annually with high variability; inflation, as a measure of CPI, also demonstrates high variability. Of particular interest is the measure of dollarization. For all Latin American countries and across all years, the mean value of dollarization is 1% (SD = 0.002). While this may seem low, it is important to remember that this is a very specific monetary measure (quasi money divided by M3) and is not a simple percentage of transactions.

Table 2. Summary Statistics*

Variable	Mean (Standard Deviation)
Inflation (CPI)	120.87 (769.66)
GDP Growth	3.65 (4.53)
Real Interest Rate	14.00 (49.06)
Unemployment (% of Total Labor Force)	8.19 (4.13)
Wages (% Total Expenditure)	27.79 (10.87)
Financing from Abroad (% GDP)	1.20 (2.11)
Foreign Direct Investment (% of GDP)	1.74 (3.24)
M1 (Billions of LCU)	3.39 (1.70)
Quasi Money (Billions of LCU)	5.94 (2.93)
Net Income from Abroad (Billions of US $)	1.27 (2.98)
Dollarization	0.01 (0.002)

* Summary statistics for variables used to construct other variables are not reported – e.g. Money and Quasi Money Growth, Quasi Liquid Liabilities. Numbers in parenthesis are standard deviations.

Theory and Model

A standard linear regression model is employed, with clustering. Clustering is necessary for data where each observation belongs to a well-identified cluster (in this case, countries). Thus, the regression clusters each country's data, and examines it over time. This is necessary because outcomes within a cluster are likely to be highly correlated, which would introduce bias, if not controlled (Wooldridge 2004). We estimate two basic relationships, one explaining GDP growth (Equation 1) and one explaining inflation (Equation 2).

$$GDP\ Growth = \beta_0 + \beta_1 dollarization_{i,t} + \beta_2 Macroeconomic_{i,t} + \beta_3 Country_{i,t} + \varepsilon_{i,t}. \quad (1)$$

$$Inflation = \beta_0 + \beta_1 dollarization_{i,t} + \beta_2 Macroeconomic_{i,t} + \beta_3 Country_{i,t} + \varepsilon_{i,t}. \quad (2)$$

The first equation states that GDP growth depends on a vector of macroeconomic variables for each country *i* at time *t*, a vector of country specific variables for each country *i* at time *t*, and the extent of dollarization in country *i* at time *t*. Inflation is explained with a similar equation. The error term is indicated as ε_{it} and varies both across countries and across time. Coefficients to be estimated are indicated as β.

Results and Analysis

Numerous specifications were attempted, and only the best regressions are reported in this paper. Additional specifications and results are available from the author by request. Due to the nature of the time-series data, we felt it was important to account for the fact that economic performance in any given year often depends on the macroeconomic performance and policies of past years; thus, several lagged terms are included. In addition, for comparison, we include both the standard Ordinary Least Squares estimated regression, as well as the General Least Squares regression, with the correction for clustering. The results for the GDP growth regression are reported in Table 3.

Table 3. Dependent Variable is GDP Growth

Explanatory Variables	Ordinary Least Squares	General Least Squares
GDP growth lagged one year	0.2877 (0.000)	0.1911 (0.000)
Country Dummy (Nicaragua)	-1.6387 (0.117)	-2.0559 (0.077)
Dollarization lagged one year	78.444 (0.373)	74.350 (0.435)
Net Trade	-1.99 E -10 (0.000)	-2.10 E -10 (0.000)
Inflation	-0.0009 (0.000)	-0.0009 (0.000)
Openness Index (Based on Foreign Direct Investment and Amount of Free Trade)	0.7365 (0.131)	0.8567 (0.109)
Constant	1.8642 (0.022)	2.2324 (0.011)

* Numbers in parenthesis are p-values.

The most important positive indicator of GDP growth is past economic growth. On average, a 1% GDP growth rate in the previous year accounts for an additional 0.29% of growth in the current year. As expected, both inflation and net trade (exports – imports) have a negative effect on economic growth. Inflation constrains consumer buying, an important component of GDP growth. When exports exceed imports also indicates low levels of consumer buying. These results are consistent with the findings of other studies. Neither dollarization nor the lagged value of dollarization (the value of dollarization in the previous year) have a significant impact on economic growth in either specification. Dummy variables for different countries were explored. Only the dummy variable for Nicaragua was statistically significant in the GDP growth regression, perhaps indicating the negative effect that 20 years of civil war had on the nation.

In contrast, dollarization does have a big impact on inflation, as shown in Table 4. Both dollarization and dollarization lagged are statistically significantly related to inflation rates, with higher levels of dollarization being associated with much lower levels of inflation. To properly interpret the impact of dollarization, we need to look at the combined effect of dollarization in the current and previous period. This combined effect suggests that it is the increase in dollarization from the previous to the current period that does the most to decrease inflation. Simply having dollarization in the past will not continue to reduce inflation alone. Controlling inflation, in turn, has important benefits for macroeconomic stability and economic growth.

Table 4. Dependent Variable is Inflation

Variables	Ordinary Least Squares	General Least Squares
GDP growth	-3.9828 (0.344)	-5.4146 (0.264)
GDP growth lag	-4.1547 (0.304)	-7.0777 (0.136)
Real Interest Rate	-5.5098 (0.000)	-6.1288 (0.000)
M2 growth	1.1878 (0.000)	1.1702 (0.000)
Dollarization	-76,655.56 (0.049)	-115,349.8 (0.011)
Dollarization lag	58,882.24 (0.032)	123,986 (0.007)
Inflation lag	-0.3029 (0.092)	-0.0536 (0.006)
Constant	9.3808 (0.937)	36.0204 (0.873)

*Numbers in parenthesis are p-values.

The remaining results of Table 4 are consistent with economic monetary theory. M2 growth (money supply growth) is correlated with higher rates of inflation and the real interest rate is correlated with lower inflation rates. Both heteroskedacity and auto-correlation are tested for in the model, but with no necessary corrections. No country dummy variables passed specification tests for the inflation regression.

Conclusion

Dollarization is the term used for the replacement of a local currency with the U.S. dollar for local and international monetary transactions. Many economists believe that dollarization is one way to create macroeconomic stability for developing countries. After conducting statistical analysis using the macroeconomic variables obtained from the World Bank Development Indicators, we can see that dollarization is positively associated with GDP growth, which we used as a measure of economic progress. When looking at the impact of dollarization on inflation, we find that more dollarization decreases inflation. This relationship is highly statistically significant and very important for policy reasons, as many Latin American countries have experienced periods of hyper-inflation.

While largely consistent with previous findings, our analysis, by including all Latin American countries for 1960 to 2003, is more robust and has broader policy implications. The study of the benefits and costs of dollarization are important for individual countries considering full dollarization, as well as for those interested in promoting economic and development in Latin America. Our results, however, also suggest potential gains from a single currency union in the Western Hemisphere.

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