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Dollarization or Monetary Independence? Evidence from Venezuela

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ABSTRACT

In the theoretical debate about the benefits of rigid exchange rate regimes, dollarization stands out as a strictly fixed scheme that is used to recover the confidence in the local monetary authority, allow the reduction of inflation, and achieve price stability in countries that adopt it. Venezuela, having monetary authorities with high inflationary bias and being in a phase of instability and volatility of its productive activity, is a good candidate for dollarizing its economy. Given this possibility, this paper identifies whether dollarization is the monetary-exchange regime that currently best suits the Venezuelan economy. We perform an empirical analysis of the costs and benefits of replacing the Bolívar with the U.S. dollar. The empirical evidence tells us that dollarization in Venezuela is undesirable because the benefits in terms of economic growth and low inflation might be limited due to the high costs derived from the low correlation between macroeconomic aggregates of both countries.

Key Words: exchange rate regime, dollarization, monetary policy, inflation, price stability

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INTRODUCTION

During the last eighteen years, we can clearly identify two periods of divergent economic results for the Venezuelan economy. The first (2004-2008) corresponds to the expansion of its economic activity due to stabilization policies carried out after the 2002-2003 oil strikes and the price increase of commodities in world markets. During this period, the first phase of the exchange and price control policy, we observed a significant improvement of capital inflows; a reduction in poverty and inequality induced by the new redistribution from oil revenue (Hurtado and Zerpa 2016); and a relative price stability achieved through high-level of imports used to meet local demand. The second period, which began in 2009 and continues up to the present, is characterized by less stable domestic prices and more volatile markets, induced by unsustainable economic policies of income distribution. These results can be attributed to the 2008 financial crisis that negatively shook most of the industrialized world, causing a significant fall in commodity prices (Hurtado 2017), and to the sharp decline in oil prices in 2014. During the last four years of this second period, we have seen the Venezuelan economy come close to a halt. The fall in oil prices; lack of exports diversification; and capital outflows induced by political instability caused a significant reduction in government spending and, as a result, affected the sustainability of policies of income distribution.[1]

The current economic conditions of the Venezuelan economy show signs of a strong depression of economic activity and hyperinflation. Overall economic activity has been falling during the last four years,[2] inflation has risen from 40.7% in 2013 to 2,820% (estimated) in 2017 and 12,870% (expected) for 2018.[3] The deepening of the fiscal imbalances; the rise in poverty and unemployment have opened the debate on what policy or what combination of policies is needed to recover economic and price stability in Venezuela. And due to the lack of credibility of monetary authorities, many economists have been talking about the advantages of

1 To relieve problems associated to families being close to poverty line, the government of Venezuela several times used direct income subsidies. These social programs were financed with the high revenue from elevated oil prices. When oil prices fell, these social programs were not sustainable anymore.

2 IMF GDP growth rates have been falling: -3.9% in 2014, -6.2% in 2015, -16.5% in 2016, -14% (estimated) in 2017 and -15% (expected) in 2018. http://www.imf.org/external/datamapper/NGDP_RPCH@WEO/OEMDC/ADVEC/WEOWORLD/VEN

3 IMF estimates. http://www.imf.org/external/datamapper/PCPIEPCH@WEO/OEMDC/ADVEC/WEOWORLD/VEN

a rigid exchange rate regime. Dollarization has become the center issue of the debate because of the positive experiences that other Latin American countries have had when they sacrificed central bank independence. For instance, Panama (1904), Ecuador (2000) and El Salvador (2001) constitute examples where dollarization has brought price stability, steady GDP per capita growth, and poverty reduction (Moran 2016). Consequently, this paper discusses the dilemma of Venezuela monetary authorities that is the pros and cons of maintaining an independent monetary system or dollarizing the economy. Empirical findings suggest that dollarization is not desirable under the current conditions of the Venezuelan economy.

This paper has been organized as follows. In the next section, the concept, cost, and benefits of the dollarization process in Venezuela are discussed. In section 3, we present the methodology of adopting the U.S. dollar. Next, we discuss the empirical methodology and describe the database, while, in the fifth section, we take the empirical evidence and analyze the costs and benefits of dollarizing the economy. Section sixth concludes.

DOLLARIZATION: THEORETICAL DISCUSSION

Keeping in mind that there are different degrees of commitment of monetary authorities; the adoption of an irrevocable fixed exchange rate regime corresponds to an intermediate arrangement between an adjustable fixed exchange rate regime and an exchange regime that implies currency substitution. Within this last group there are two options: currency substitution with an already existing currency such as the dollar, euro, yen, or sterling pound, or a new currency. In this paper, we will define the process of currency substitution assuming that the Venezuelan monetary authorities adopt the U.S. dollar as the legal tender. In what follows, we will review not only the theoretical costs and benefits of dollarization[4] but also the characteristics of its implementation, considering the degree of institutional commitment and the macroeconomic structure required for an optimal functioning.

Dollarization seeks to recover macroeconomic stability by adopting the currency of the main trading partner. The idea of adopting the U.S. dollar as the legal currency in Venezuela comes from the possibility of:

4 In the literature, the use of the term dollarization is indifferent to whether the currency is the dollar, the yen, the euro or any other currency.

a) importing lower and more stable inflation, b) stimulating private investment, c) lowering transaction costs, d) strengthening the financial system, and e) boosting economic growth, among others.

The conditions under which dollarization processes occurs are diverse, although in some cases these may be common to both, *de facto* or official dollarization. In *de facto* dollarization, there is no direct intervention by monetary authorities. Although the legal currency continues to be in force, the demand for money is diverted to obtaining foreign currency. The economies where this process is evident tend to have the following characteristics: 1) most of the transactions are made in foreign currency, 2) most of the prices are in dollars or indexed at the highest exchange rate, 3) savings are maintained in foreign currency, 4) there is poor monetary performance that deteriorates the credibility of monetary authorities and domestic currency, 5) collection of a low seigniorage for issuing the domestic currency, and 6) permanent inflationary pressures and low capacity to implement monetary policies without financial risk (Schuler 1999; León 2000). On the other hand, the official dollarization process implies the recognition by local authorities of the costs and benefits of replacing the national currency with a foreign one. If dollarization is part of a unilateral decision by local monetary authorities; then no negotiations to reach any form of agreement on the objectives and monetary policy instruments to be used are carried out with the country that issues the foreign currency (Schuler 1999). Nevertheless, the decision about the best way to dollarize the Venezuelan economy is by: a) considering the nature of the shocks, b) the flexibility of markets, and c) the degree of trade openness the domestic country has with respect to the country that issues the foreign currency.

The following are costs associated with dollarization: 1) lack of independent monetary policy, 2) loss of seigniorage, 3) foreign exchange acquisition costs for the exchange of the local currency, 4) application costs related to operating costs of changing coins and bills, programming of cash registers, education of the population about the new currency, and identification of counterfeits, among others, 5) need to achieve a balanced budget to preserve the stability of the economy, 6) absence of lender of last resort because the domestic central bank cannot print money to give lines of credit to banks; so it stops working as a lender of the financial system in case of liquidity needs or negative shocks, 7) local economic pressures for the dollarized country when economic cycles do not coincide with those of the issuing country, 8) bank risks in case of a sudden increase in liabilities in dollars, and 9) political and

cultural impact on the substitution of the domestic monetary sign (Hanke and Schuler 1999; León 2000; Levy-Yeyati and Sturzenegger 2001; Levy 2003).

On the other hand, among the benefits of dollarization, we could find: a) the reduction of inflation because the incentives to stimulate the economy by monetizing budget deficits are eliminated; b) with the reduction of transaction costs, there is no need to use different currencies in economic activities and the intermediation costs in the market disappear; c) the elimination of the exchange risk; d) the incentives to foreign investment and improved functioning of financial markets; e) the enhancement of credibility by entailing a stable fiscal and monetary policy; f) the non-requirement in the design of a supranational institutional system; g) the greater openness of the economy and transparency of the government due to the lack of a domestic currency that needs to be protected; h) the elimination of the possibility of balance of payments crises and exchange controls; and i) the stimulus to exports growth in because the reduction of the volatility of the real exchange rate and the future profitability of productive sectors (León 2000; Levy-Yeyati and Sturzenegger 2001; Levy 2003). In this order, due to the high cost of abandoning it; dollarization represents a scheme based on the boost to the credibility of local authorities as well as the elimination of doubts about the continuity of economic policy. By the same token, the advantages of dollarization can be summarized by: 1) the lower volatility of the financial markets, and 2) the greater efficiency in the economy, by improving the quality of the financial system through access by more efficient local and foreign financial institutions (Schuler 1999).

According to Schuler (1999), León (2000), and Levy-Yeyati and Sturzenegger (2001) and given the fact that Venezuela is a small economy, implementing a dollarization process with the U.S. dollar implies important risks for the country. These risks are associated with the vulnerability to monetary shocks in the event that a large number of dollar holders suddenly change to other convertible currencies; the limited space for economic policy; and the option of sustained control of capital flows from the large country can lead to the isolation of international flows. This last risk is very unlikely to become reality in the present context.

In Latin America, the dollarization processes carried out in Panama (1904), Ecuador (2000) and El Salvador (2001) were unilateral policies where the substitution of the local currency for the U.S. dollar did not imply a formal commitment with the authorities of the Federal Reserve. By dollarizing their economies, Ecuador and El Salvador were able to

eliminate domestic monetary instability, reduce the lack of confidence about the recovery of economic activity, and address political, economic and social instability (Arguello 2007; Sierra and Lozano 2010; White 2017). Its implementation was carried out differently considering the characteristics of each economy, the particularities of its markets, and the objectives established by its local authorities.

Regarding the possibility of dollarizing the Venezuelan economy, previous studies have focused on the theoretical analysis of the costs and benefits of replacing the Bolivar with the dollar; and the estimation of the levels of unofficial dollarization in Venezuela. Thus, León (2000) in the academic debate about the single currency and dollarization highlights the role of political will in the choice of the exchange rate regime that best suits the country. León points out that official dollarization would not lead to the financial systems of Venezuela and the United States being integrated into one; and recognizes that such a measure is not a perfect solution since it is necessary to implement economic reforms to correct for several structural problems of the economy. Levy (2003) points out that the costs of dollarization cannot be evaluated in an absolute way, but relatively; factors such as the degree of capital mobility and preferences for financial factors must be considered. Particularly, in this new scenario for Venezuela, the roles of expectations and of the financial system in the new scenario are important. Castellano (2012) found empirical evidence of currency substitution in Venezuela for the period 1997-2008. Particularly, he found that the dollar has assumed the roles of store of value and medium of exchange. These constitute important conditions that favor dollarization. Torrealba (2015) presents dollarization as an option for monetary policy for Venezuela through a theoretical cost-benefit analysis; in this regard, it states that adopting the dollar would be a solution to the inflationary problem and the inadequate management of domestic monetary policy; but warns that without institutional adjustments, it will be impossible to achieve the expected theoretical effects.

These works not only coincide in highlighting the potential benefits and theoretical costs that the country would face; but also insist that in addition to economic variables, political and social factors must also be considered if dollarization were adopted by Venezuelan authorities. They also highlight the lack of empirical studies that estimate the impact of giving up independent monetary policy and, therefore, more analysis is needed. In this sense, the aim of this paper is to identify whether dollarization is the monetary-exchange regime that best suits the Venezuelan economy.

METHODOLOGY

In this section we present the model proposed by Richard Clarida, Jordi Galí and Mark Gertler (1999) that allows us to recognize the characteristics of an optimal monetary policy. This decision significantly influences the evolution of the economy since it may bring important consequences for overall economic activity in the short and long run. This approach has been used by Georgios Karras (2012),[5] José U. Mora (2006), and Davide Furceri and Georgios Karras (2008) to identify the costs and benefits of being part of a monetary union or selecting a specific and independent monetary regime.

In this sense, following Karras (2012), Mora (2006), and Furceri and Karras (2008), we assume that there are N economies (i=1, 2, ..., N), and in each of them the loss function of the monetary authority takes the form of:

$$L_i=\tfrac{1}{2}E_t\left\{\sum_{j=0}^{\infty}\beta^j\left[a_i(y_{i,t+j}-k_i)^2+\pi^2_{i,t+j}\right)\right]\right\} \quad (1)$$

Where y_i is real output (in deviations from its trend), π_i the inflation rate, a_i the relative weight given to the deviations of real output ($a_i>0$), k_i and the distance with respect to the production goal of each country i. In this case, $k\geq 0$ is assumed when there are distortions due to the imperfections of the markets and the impact of taxes on the functioning of the real economy. E_i and β are the mathematical expectations and the discount factor, respectively.

For each economy, the aggregate supply is given by the following Phillips curve augmented by expectations:

$$\pi_{i,t}=\lambda_i y_{i,t}+E_t\pi_{i,t+1}+u_{i,t} \quad (2)$$

Where $\lambda_i>0$, $u_{i,t}=\emptyset_i u_{i,t-1}+z_{i,t}$, $0<\emptyset_i<1$ $yz_{i,t}\sim iid(0, t_i^2)$. This equation can also be written as an aggregate supply as follows:

$$y_{i,t}=\vartheta_i(\pi_{i,t}-E_t\pi_{i,t+1})+v_{i,t} \quad (3)$$

Where $\vartheta_i=1/\lambda_i$ and $v_{i,t}=-u_{i,t}/\lambda_i$. Taking into account that $v_{i,t}=\emptyset_i v_{i,t-1}$ $-\lambda_i^{-1}z_{i,t}$, real output variance is given by:

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5 Karras has used the same model in previous papers. See Karras (2000; 2002; 2003; 2005).

$$\sigma_i^2 \equiv Var(v_{i,t}) = t_i^2[\lambda_i^2(1-\varnothing_i^2)]^{-1}$$

Using this information, the following describes each of the alternatives that Venezuela must select for its monetary regime: independent monetary policy or dollarization.

INDEPENDENT MONETARY POLICY

In this first alternative, the Central Bank of Venezuela (BCV, by its initials in Spanish), maintains its independence and autonomy to carry out monetary policy.[6] Within the context of the model outlined above, this implies that by minimizing equation (1) subject to restriction (2), we obtain the following function of the discretionary actions of monetary authorities:

$$\pi_{i,t}^{IND} = a_i q_i u_{i,t} + \frac{a_i}{\lambda_i} k_i = -a_i q_i \lambda_i v_{i,t} + \frac{a_i}{\lambda_i} k_i \quad (4)$$

and

$$y_{i,t}^{IND} = -\lambda_i q_i u_{i,t} = \lambda_i^2 q_i v_{i,t} \quad (5)$$

Where the superscript *IND* refers to the results obtained in terms of inflation and production derived from an independent monetary policy regime and $q_i = [\lambda_i^2 + a_i(1-\beta\varnothing_i]^{-1}$. The behavior of the economy is explained by the average (trend) of the inflation rate, which is equal to:

$$\overline{\pi}_i^{IND} = \frac{a_i k_i}{\lambda_i} \quad (6)$$

and the volatility of real output equals to:

$$Var(y_i^{IND}) = \lambda_i^4[\lambda_i^2 + a_i(1-\beta\varnothing_i)]^{-2}\sigma_i^2 \quad (7)$$

In this sense, the inflationary bias is expected to increase with the relative weight assigned to the deviations of real output (a), the production goal that the authorities have (k), and the slope of the aggregate supply

6 It is important to emphasize that this option does not eliminate the possibility that the BCV may change the monetary cone (i.e. eliminating three zeros to the current currency) but without sacrificing the monetary policy independence.

($\vartheta_i=1/\lambda$). Thus, we identify a dilemma between the inflation rate and the variability of real product: if is very low, which means that the BCV is very conservative; in the sense of giving a greater relative weight to inflation than to real product, the average inflation will be very low but real GDP will be very unstable. On the contrary, when the monetary authority grants a greater relative weight to real product, *a* is high; then the evolution of real output will be more stable, but inflation will be higher.

DOLLARIZATION

Suppose now that Venezuelan authorities unilaterally adopt the U.S. dollar as its legal currency. As pointed out before, no negotiation arrangement nor a formal commitment with the U.S. takes place about monetary policy instruments and objectives since this is delegated to the FED. Thus, the FED has complete independence to design and implement monetary policy. In this sense, the money supply is considered an endogenous variable that is a function of the balance of the balance of payments. In this way, for $i=1, 2, ..., N$, the equilibrium indicates that $\pi_{i,t}^{DOL}=\pi_{i,t}^{DOL}=\pi_{i,t}^{DOL}$, where $\pi_{i,t}^{DOL}$ is given by (4). Substituting this result into equation (3), we obtain the aggregate supply that corresponds to this scenario, as equation (8) shows:

$$y_{i,t}^{DOL}=-a_1q_1(1-\varnothing_1)v_{1,t}+v_{i,t} \tag{8}$$

Where the *DO*L superscript describes the results under dollarization. As a result, Venezuelan real GDP is affected by its own shocks, , and by the common shocks with the United States, $v_{1,t}$. Shocks that affect the U.S. economy are transmitted to the dollarized economy through foreign transactions in goods and services and capital flows. Thus, the inflation rate would be given by:

$$\overline{\pi}_i^{DOL}=\frac{a_1\bar{k}_1}{\lambda_1} \tag{9}$$

and the volatility of real output by:

$$Var(y_{i,t}^{DOL})=a_1^2q_1^2(1-\varnothing_1)^2\sigma_1^2+\sigma_i^2-2a_1q_1(1-\varnothing_1)\rho_{i,1}\sigma_i\sigma_1 \tag{10}$$

Where $\rho_{i,1} \equiv corr(v_{i,t}, v_{1,t})$. Using equations (9) and (10), it is possible to identify the costs and benefits of dollarization. On one hand, the main benefit of dollarization is recognized when we compare equations (6) and (9); if $a_i > a_1$ and $k_i > k_1$, which means that the FED has a more conservative monetary policy than the BCV, the rate of inflation under dollarization would be lower than the inflation rate under an independent monetary policy. On the other hand, the main cost of dollarization is associated with the increase in real output volatility. This volatility arises from the asynchronies between the U.S. and Venezuela cycles and the vulnerability of this country to the U.S. monetary policy. Comparing equations (7) and (10), we see that the closer $\rho_{i,1}$ is to one, the lower the volatility of real output. In other words, the more synchronized business cycles, the lower the volatility of real output and the better the monetary policy carried out by the FED compared to the one conducted by the BCV.

EMPIRICAL METHODOLOGY AND STATISTICAL DATA

To quantify the costs and benefits of dollarization in Venezuela, we obtained data for real GDP in per capita terms (*GDPpc*), nominal exchange rate, and inflation rate. These data were extracted from the World Development Indicators of the World Bank. The data set includes two economies: Venezuela and the United States and covers the period 1965-2015.

From these data, we constructed the depreciation rate of the Bolivar against the dollar and the inflation rate as: $(x_{i,t} - x_{i,t-1})/x_{i,t-1}$. Regarding the estimation of the cyclical component of *GDPpc*, we proceeded as follows: 1) Computing the *GDPpc* growth rate by simple difference, $(PIB_{pc,i,t} - PIB_{pc,i,t-1})/PIB_{pc,i,t-1}$; and 2) through the Hodrick-Prescott filter (HP), proposed by Robert Hodrick and Edward Prescott (1981), used frequently in the economic literature. Suppose that $y_{i,t} = ln(PIB_{pc,i,t})$. Let $\bar{y}_{i,t}$ be the trend component that minimizes:

$$\sum_{t=1}^{T} (y_{i,t} - \bar{y}_{i,t})^2 + l \sum_{t=2}^{T-1} [(\bar{y}_{i,t+1} - \bar{y}_{i,t}) - (\bar{y}_{i,t} - \bar{y}_{i,t-1})]$$

for $l > 0$, then the term $y_{i,t} - \bar{y}_{i,t}$ is considered the cyclical component. To perform the decomposition between the cyclical and trend components,

we set l=100, the recommended value for working with annual data (Kydland and Prescott 1989).

EMPIRICAL EVIDENCE

Table 1 shows the averages of the annual growth rate, the inflation rate, and the depreciation rate of the domestic currency for the period 1965-2015. During the period, Venezuela showed a small and negative economic growth rate (-0.05%), among other things because of the economic crises of the last years of the 20th century and because of, perhaps, the domestic macroeconomic policies of the last fifteen years; the evolution of the Venezuelan per capital real output differs from the results obtained for the United States. U.S. per capita real *GDP* grew at an average rate of 1.98 percent per year. Additionally, the average depreciation rate of the Bolivar against the U.S. dollar was 18.46 percent because of the different exchange rate crises (1983, 1989, 1997 and 2002-2003), the political instability of recent years, the growing inflationary pressures, and the frequent nominal devaluations that were carried out during the last three decades. And, in terms of inflation, the Venezuelan economy reached an inflation rate of 25.27 percent, much higher than the inflation rate for the United States (4.11%). It can also be seen in this table that Venezuela registered the highest volatility (measured by the standard deviation) of each of the variables considered.

Table 1. Economic growth, nominal exchange rate, and inflation (1965-2015)

Country	g	$\sqrt{Var(g)}$	Δe	$\sqrt{Var(\Delta e)}$	π	$\sqrt{Var(\pi)}$
U.S.	1.98	2.02	0	0	4.11	2.84
Venezuela	-0.05	5.25	18.46	31.97	25.27	25.31

Source: World Bank.
g: Average growth rate of *GDPpc*.
Δe: Bolivar´s average depreciation rate against the dollar.
π: Average inflation rate.

According to these results, the following benefits and costs could be expected from this dollarization process:

(a) Benefits

As previously mentioned, the main benefits of dollarization are associated

with 1) the reduction of inflation and 2) the recovering of price stability, given that the FED is less prone to generate inflation compared to the BCV. Reviewing table 1, the inflation rate for Venezuela for the period 1965-2015 shows that the BCV has had a tradition of generating inflation. However, this has not always been the case.

In order to perform a deeper analysis, we proceeded to divide the sample into two sub-periods of equal length of time: 1965-1990 and 1991-2015. Results are shown in table 2. In fact, in the first period (1965-1990), the inflationary bias of the Venezuelan monetary authorities led to an average inflation rate of 13.24 percent, while in the United States was only around 5.73 percent. However, results for the period 1991-2015 are quantitatively larger, the inflationary bias in Venezuela increased, reaching an average of 37.78 percent. The opposite occurred in the United States, where the inflation rate fell to 2.42 percent because of the anti-inflationary policy of the FED during the last 35 years. Therefore, Venezuela would benefit significantly from adopting the dollar as its own currency.

Table 2. Economic growth, nominal exchange rate, and inflation by sub-periods

Country	g	$\sqrt{Var(g)}$	Δe	$\sqrt{Var(\Delta e)}$	π	$\sqrt{Var(\pi)}$
1965-1990						
U.S.	2.50	2.25	0	0	5.73	3.07
Venezuela	-0.53	3.91	12.67	32.78	13.24	17.54
1991-2015						
U.S.	1.43	1.64	0	0	2.42	1.06
Venezuela	0.46	6.40	24.48	30.59	37.78	26.35

Source: World Bank.
g: Average growth rate of *GDPpc*.
Δe: Bolivar´s average depreciation rate against the dollar.
π: Average inflation rate.

Regarding the exchange rate, the high rate of depreciation of the Bolivar against the dollar has been associated to the reasons that explain the continuous loss of external competitiveness of Venezuelan products with respect to the U.S. counterparts. In the analysis by sub-periods, we observed that the average volatility of the exchange rate increased from 12.67 percent during the sub-period 1965-1990 to 24.48 percent per year in the next one. Thus, due to its history of foreign exchange risk, Venezuela would be greatly benefited by adopting the dollar as a local currency.

As shown in table 1, the economic activity of Venezuela during the period 1965-2015 contracted, among other things, by the effects of the economic crises of the last years of the 20th century and because of domestic macroeconomic policies carried out during the last thirty years. When identifying the behavior of *GDPpc* between 1965 and 1990, the fall in per capita real income of Venezuela of 0.53 percent contrasts with the growth rate of 2.50 percent for per capita real output. Nevertheless, the story turns somewhat different for the period 1991-2015. Venezuela per capita real output growth rate increased to 0.46 percent, while the U.S. grew at a slower rate (1.43 percent) compared to the previous period. Likewise, we also observed that both, the growth rate and the inflation rate, registered greater volatility during the second sub-period. Given that the macroeconomic stability allowed by dollarization leads to higher economic growth rates, Venezuela could benefit from the adoption of the dollar as the domestic currency.

(b) Costs

The costs of dollarization are associated with the loss of discretion to carry out independent monetary policy by the BCV. In this sense, table 3 presents the correlation coefficient of real output and inflation for Venezuela with the corresponding indicators of the United States.

Table 3. Correlation of growth and inflation rates with the United States

Period	H-P*	g^1	π^2
1965 - 2015	0.13	0.08	-0.33
1965 - 1990	0.24	0.25	0.07
1991 - 2015	0.06	0.01	-0.33

Source: Author's calculations based on World Bank.
*: Correlation coefficient of the cyclical component of *GDPpc* using the Hodrick-Prescott filter.
1: Correlation coefficient between growth rater.
2: Correlation coefficient of inflation rates.

According to these results, the growth and inflation rates show non-significant and, in some cases negative, correlations. Particularly, we observe that for the complete sample the economic cycles are not synchronized. The correlation coefficient is just 0.13. Next, when analyzing each of the sub-periods, we notice that the correlation decreased from 0.24 for 1965-1990 to 0.06 in 1991-2015. This lack of business cycles synchronization could be explained by the several economic crises suffered

by Venezuela; the fall in the oil industry productivity; and the limited results achieved in the different efforts to change the economic structure of the country. This implies that the lack of correlation between both economies makes the alternative of carrying out the dollarization very costly. Foreign shocks that affect both countries differently will bring about unequal impacts and will increase the costs of the stabilization policies.

With respect to the inflation rate, we observe that, as with real income, none of the correlation coefficients is statistically significant. When observing the results by sub-periods, it is worth pointing out the low correlation coefficient for the 1965-1990. However, this correlation turns out to be negative (although not significant) in the second period (1991-2015). This negative correlation could be associated to price instability, recurrent fiscal imbalances, and frequent devaluations of the domestic currency; these, of course led to both price levels move apart from one another. As shown, the unintended effects of the U.S. anti-inflationary monetary policy, brings Venezuela closer to a scenario where it is possible to reduce inflation without the need to dollarize the economy.

Considering the relationship between the costs and benefits of dollarization in Venezuela; empirical results showed that the reduction of inflation and the recovery of price stability that dollarization will bring as benefits are not in balance with the negative correlation levels of *GDPpc*. These would make the country more vulnerable to foreign shocks. On the other hand, the new trend of Venezuelan inflation suggests that the cost of dollarization will increase because the transmission of the effects of the U.S. anti-inflationary policy are negligible. This implies that it would be more harmful to reduce inflation and bring price stabilization in Venezuela with dollarization; than through the implementation of a clear and credible commitment of the BCV authorities. In addition, the context of greater political conflict between Venezuela and the United States increases the costs of adopt the U.S. dollar. Therefore, due to the high costs, the option of dollarizing turns out to be undesirable.

Finally, it is important to emphasized that the solution to the Venezuelan crisis is not only economic, but also political. It requires a profound revision of the institutions and the political project on which they have their foundations. Thus, dollarization can be a very interesting alternative if the strength of the institutions imposes restrictions on fiscal authorities; limiting their indebtedness capacity and preventing an expansion of the monetary aggregates that could create inflationary pressures and further currency crises (Zambrano, Vera and Sáez 2018). This is an immediate

need. It is a challenge for these new institutions to design and implement credible economic policies; that generate the incentives to attract foreign investment and that local capitals remain in the country. Venezuelan authorities need to work designing and implementing policies that facilitate: 1) the diversification of the productive structure of the economy, 2) stimulate aggregate supply, and 3) lead to a greater synchronization of U.S.-Venezuela business cycles. In this way, Venezuela's vulnerability to face external imbalances could be reduced.

CONCLUSIONS

The aim of this work is to evaluate how feasible it is to adopt the U.S. dollar as the legal currency; against how feasible it is to maintain an independent monetary policy regime in Venezuela. Dollarization is the process of officially replacing the local currency of a country with a convertible currency. Economic theory stablishes that the benefits of dollarization are related to the possibility of a) importing a low and stable inflation, b) replicating the behavior of the interest rate of the issuing country, c) reducing transaction costs, d) strengthening the financial system, e) stimulating private investment, and f) boosting economic growth. While the loss of seigniorage; the need to accumulate high levels of international reserves to replace the local currency; and the lack of independent monetary policy, among others, are costs of the process of adopting a foreign currency as their own. Additionally, with the elimination of the central bank as monetary authority, other risks associated with dollarization are 1) the elimination of the figure of lender of last resort, 2) risks for banks would increase, and 3) the local pressure on the dollarized economy when business cycles are not synchronized.

Empirical analysis made it possible to identify the main benefits of the dollarization for the Venezuelan economy. If Venezuela adopts the U.S. dollar as domestic currency, it could eliminate the inflationary bias from the BCV and reduce the average inflation rate to levels below 10 percent as a result of importing the effects of anti-inflationary policy of the FED; eliminate foreign exchange risk; and achieve macroeconomic stability that would boost economic growth. Nevertheless, the costs of replacing the Bolivar with the dollar will cause the loss of carrying out independent monetary policy to correct for macroeconomic imbalances. The negative effects that the anti-inflationary policy of the United States. Given the low correlation between the inflation levels of both countries,

could increase the vulnerability of Venezuela to external shocks that affect it differently compared to the United States; and could increase the costs associated with the implementation of a stabilization policy after adopting the dollar as legal currency.

Thus, the option of dollarizing the Venezuelan economy is considered undesirable, despite its potential to diminish exchange market instability and to allow importing the anti-inflationary credibility of the FED. These benefits would be conditioned primarily by the poor correlation between the business cycles of Venezuela and the United States. This may cause high costs of transferring monetary policy, bringing unexpected effects, increasing the vulnerability of the Venezuelan economy to asymmetric shocks, and increasing the costs of domestic fiscal policy.

In this sense, considering the costs of dollarization; it is important to build credibility on strong institutions that recover the purchasing power of the Bolivar and enhance the potential to the economy of Venezuela.

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