Monetary Policy and Currency Boards

Latin America and Caribbean Countries Examples Vol.2

Steve Hanke
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Editors

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Foreword

It is possible to present a brief summary of the subjects that the chapters in this book focus on.

Ch 1. The Hanke-Krus World Hyperinflation Table first appeared in the authoritative Routledge Handbook of Major Events in Economic History, which was published in 2013. The table contained every country that had ever experienced a hyperinflation – all 56 of them. With this paper, we amend the Table and add a 57th entry: Venezuela. On December 3, 2016, Venezuela's inflation met all the criteria required to qualify as a hyperinflation. Specifically, Venezuela's monthly inflation rate exceeded 50 percent per month for 30 consecutive days.

Ch 2. This chapter examines Argentina's Caja de Conversión in 1907 and 1908, when a financial panic affected a number of other financial markets. Through an analysis of the Caja's monthly balance sheets (digitized in an accompanying workbook), it tests the degree of the Caja's currency board orthodoxy and analyzes the effects of the panic on the Argentine economy.

Ch 3. We examine to what extent Bermuda's monetary authorities have operated like currency boards, using statistical tests based on balance sheets and an analysis of Bermuda's

legislation. Our analysis indicates that in the early 20th century, Bermuda had a currency board system. In later years, problems with analyzing the balance sheet make a judgment based on statistical tests more difficult. We provide a companion spreadsheet workbook of annual or semiannual data of the monetary authority for the past 100 years.

Ch 4. The Cayman Islands and Hong Kong are two of the world's great financial centers. They both owe a great deal of their success to the fact that they employ currency boards. Their currency boards allow them to issue the Cayman and Hong Kong dollars. Both of these domestic currencies are, in fact, clones of the mighty U.S. dollar—the world's dominant international currency. Currency boards have existed in over 70 countries. The first one was installed in the British Indian Ocean colony of Mauritius in 1849. By the 1930s, currency boards were widespread among the British colonies in Africa, Asia, the Caribbean, and the Pacific islands. They have also existed in a number of independent countries and city-states, such as Danzig and Singapore. One of the more interesting currency boards was installed in North Russia on November 11, 1918, during the civil war. Its architect was none other than John Maynard Keynes, a British Treasury official responsible for war finance at the time.

Ch 5. This chapter analyzes the historical background and current conditions relating to Venezuela's economic crisis, focusing on its monetary and financial aspects. It aims to assist in making recommendations for appropriate monetary reforms, such as the establishment of an orthodox currency board or official dollarization. The paper addresses critical questions concerning such monetary reforms, as well as complementary economic reforms that would improve Venezuela's troubled economy in the near future.

Ch 6. We provide a historical summary, legislative history, and the first spreadsheet data series of the British Honduras Board of Commissioners of Currency (1894-1976) and examine to what extent it operated as a currency board using statistical tests. This paper makes the annual balance sheets of the currency board available in machine-readable form for the first time, in a companion spreadsheet workbook.

Ch 7. This chapter was part of a larger project to determine

how currency board monetary systems have performed. The goal was to find information about the note issue of Argentina's Banco de la Provincia in the mid 1800s in order to determine if Argentina had a currency board system. I also tried to find answers to the questions of why the note issue arrangement was established, how it worked organizationally and why it was replaced. The majority of the information I found came from the book *El Banco de la Provincia* by Osvaldo Garrigos. Other accounts of this period include *Straining at the Anchor: The Argentine Currency Board and the Search for Macroeconomic Stability* by Gerardo della Paolera and Alan Taylor and *La economía argentina en el largo plazo* by Roberto Cortés Conde, but they are less detailed in their descriptions of the history of the Banco de la Provincia.

S. Hanke & B. Kargı
Baltimore & Istanbul
January 15, 2023

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1 Venezuela enters the record book: The 57th entry in the Hanke-Krus world hyperinflation table

Steve ***Hanke*** & Charles ***Bushnell***

Introduction

The Hanke-Krus World Hyperinflation Table first appeared in the authoritative Routledge Handbook of Major Events in Economic History, which was published in 2013. The table contained every country that had ever experienced a hyperinflation – all 56 of them. With this paper, we amend the Table and add a 57th entry: Venezuela. On December 3, 2016, Venezuela's inflation met all the criteria required to qualify as a hyperinflation. Specifically, Venezuela's monthly inflation rate exceeded 50 percent per month for 30 consecutive days.

What was the genesis of the Hanke-Krus World Hyperinflation Table? What are the criteria required for a country to qualify for the hyperinflation designation? What is the standard method for estimating inflation in countries that are experiencing elevated inflation rates, and why is this method the superior method? And how is the standard method used to estimate Venezuela's inflation rates, and what are those rates? These are the main questions we address.

In 2010, one of us (Hanke) was invited to write the survey article on hyperinflation for The Routledge Handbook of Major Events in Economic History. Hanke accepted the invitation, thinking it would require routine work on his part and that he could complete the task in short order. He had already surveyed the literature on hyperinflation and had accurately estimated the inflation rates in several countries that had experienced hyperinflation. These included two relatively recent, dramatic hyperinflations – Yugoslavia (Hanke, 1999) and Zimbabwe (Hanke & Kwok, 2009). In addition, he had designed and implemented currency reforms that had stopped hyperinflations, notably Bulgaria's (Hanke, 2016).

While reflecting on the hyperinflation literature, Hanke was struck by its lack of uniformity and clarity. The literature was widely scattered in time and space; it had been written by many different researchers, and those researchers had used diverse methods to estimate and analyze the inflation episodes studied.

So, Hanke concluded that the best way to "clean up" the subject of hyperinflation was to create a "World Hyperinflation Table." In his mind, this table would include all of the world's hyperinflations. The data would be presented in a uniform and clear manner, so that all hyperinflations could be compared. But, what criteria would be used for an episode of inflation to qualify as a hyperinflation? Hanke specified the following three qualifying criteria:

1. Following Phillip Cagan's (1956) classic article on hyperinflation, the economics profession adopted the following criterion: to qualify as a hyperinflation, the inflation rate had to be at least 50 percent per month. Hanke adopted this convention.
2. In addition, Hanke specified that the 50 percent rate had to persist for at least 30 consecutive days.
3. Lastly, Hanke mandated that the inflation episode had to be fully documented and that inflation estimates had to be replicable.

It turned out that the third criterion was the most difficult one. Fortunately, Hanke's chief research assistant at the time, Nicholas Krus, was capable and interested in taking on this

research task. Hanke and Krus spent the better part of two years constructing what has come to be known as the Hanke-Krus World Hyperinflation Table. They documented and recalculated the inflation rates for all alleged hyperinflations in history. The project required the gathering of primary data for each potential case of hyperinflation. This proved to be very difficult and time consuming. For example, primary data for the French hyperinflation of 1795 to 1796 – the first verified hyperinflation – had to be obtained and analyzed. But, that was not the most difficult set of data to obtain. That "prize" was awarded to the Republika Srpska, which experienced a hyperinflation in the 1992-1994 period. Fortunately, Hanke was able to use his extensive contacts in the former Yugoslavia to eventually obtain high-quality inflation data for the Republika Srpska.

After a long and onerous research effort, the Hanke-Krus World Hyperinflation Table was published. It is contained in "World Hyperinflations," which is a chapter in The Routledge Handbook of Major Economic Events in History (2013) co-authored by Hanke and Krus.

The Table (amended to include Venezuela) is reproduced below. The original Table contained 56 hyperinflation episodes. Several things are noteworthy and merit mention. The most famous and well-known hyperinflation episode is the Weimar Republic's German hyperinflation. It peaked in October 1923 at 29,500 percent per month. This rate is many times below Zimbabwe's November 2008 peak hyperinflation of 79.6 billion percent – that is 80 followed by nine zeros. But, Zimbabwe's hyperinflation was only the world's second highest. It was miniscule next to Hungary's July 1946 peak monthly rate of 41.9 quadrillion percent – that is 42 followed by 15 zeros. While the German hyperinflation ranked 5th in the world hyperinflation rankings, its magnitude is much less than the top four inflations.

Table 1. *The Hanke-Krus World Hyperinflation Table (2013, Amended 2016)*

Location	Start Date	End Date	Month With Highest Inflation Rate	Highest Monthly Inflation Rate	Equivalent Daily Inflation Rate	Time Required For Prices To Double	Currency	Type Of Price Index
Hungary [1]	Aug. 1945	Jul. 1946	Jul. 1946	4.19 x 1016%	207%	15.0 hours	Pengö	Consumer
Zimbabwe [2]	Marc.2007	Mid-Nov. 2008	Mid-Nov. 2008	7.96 x 1010%	98.0%	24.7 hours	Dollar	Implied Exchange Rate*
Yugoslavia [3]	Apr. 1992	Jan. 1994	Jan. 1994	313,000,000%	64.6%	1.41 days	Dinar	Consumer
Republika Srpska † [4]	Apr. 1992	Jan. 1994	Jan. 1994	297,000,000%	64.3%	1.41 days	Dinar	Consumer
Germany [5]	Aug. 1922	Dec. 1923	Oct. 1923	29,50%	20.9%	3.70 days	Papiermark	Wholesale
Greece [6]	May.41	Dec. 1945	Oct. 1944	13,80%	17.9%	4.27 days	Drachma	Exchange Rate‡
China § [7]	Oct. 1947	Mid-May 1949	Apr. 1949	5,07%	14.1%	5.34 days	Yuan	Wholesale for Shanghai
Free City of Danzig [8]	Aug. 1922	Mid-Oct. 1923	Sep 1923	2,44%	11.4%	6.52 days	German Papiermark	Exchange Rate**
Armenia [9]	Oct. 1993	Dec. 1994	Nov. 1993	438%	5.77%	12.5 days	Dram & Russian Ruble	Consumer
Turkmenistan †† [10]	Jan. 1992	Nov. 1993	Nov. 1993	429%	5.71%	12.7 days	Manat	Consumer
Taiwan [11]	Aug. 1945	Sep. 1945	Aug. 1945	399%	5.50%	13.1 days	Yen	Wholesale for Taipei
Peru [12]	Jul. 1990	Aug. 1990	Aug. 1990	397%	5.49%	13.1 days	Inti	Consumer
Bosnia and Herzegovina [13]	Apr. 1992	Jun. 1993	Jun. 1992	322%	4.92%	14.6 days	Dinar	Consumer
France [14]	May 1795	Nov. 1796	Mid-Aug. 1796	304%	4.77%	15.1 days	Mandat	Exchange rate
China [15]	Jul. 1943	Aug. 1945	Jun. 1945	302%	4.75%	15.2 days	Yuan	Wholesale for Shanghai
Ukraine [16]	Jan. 1992	Nov. 1994	Jan. 1992	285%	4.60%	15.6 days	Russian Ruble	Consumer
Poland [17]	Jan. 1923	Jan. 1924	Oct. 1923	275%	4.50%	16.0 days	Marka	Wholesale
Nicaragua [18]	Jun. 1986	Mar.91	Mar.91	261%	4.37%	16.4 days	Córdoba	Consumer
Congo (Zaire) [19]	Nov. 1993	Sep. 1994	Nov. 1993	250%	4.26%	16.8 days	Zaïre	Consumer
Russia †† [20]	Jan. 1992	Jan. 1992	Jan. 1992	245%	4.22%	17.0 days	Ruble	Consumer
Bulgaria [21]	Feb. 1997	Feb. 1997	Feb. 1997	242%	4.19%	17.1 days	Lev	Consumer
Moldova [22]	Jan. 1992	Dec. 1993	Jan. 1992	240%	4.16%	17.2 days	Ruble	Consumer
Venezuela [23]	Nov. 2016	Ongoing	Nov. 2016	221%	3.96%	17.8 days	Bolivar	Exchange Rate***
Russia / USSR [24]	Jan. 1922	Feb. 1924	Feb. 1924	212%	3.86%	18.5 days	Ruble	Consumer
Georgia [25]	Sep. 1993	Sep. 1994	Sep. 1994	211%	3.86%	18.6 days	Coupon	Consumer
Tajikistan ††[26]	Jan. 1992	Oct. 1993	Jan. 1992	201%	3.74%	19.1 days	Russian Ruble	Consumer
Georgia [27]	Mar.92	Apr. 1992	Mar.92	198%	3.70%	19.3 days	Russian Ruble	Consumer
Argentina [28]	May.89	Mar.90	Jul. 1989	197%	3.69%	19.4 days	Austral	Consumer
Bolivia [29]	Apr. 1984	Sep. 1985	Feb. 1985	183%	3.53%	20.3 days	Boliviano	Consumer
Belarus ††[30]	Jan. 1992	Feb. 1992	Jan. 1992	159%	3.22%	22.2 days	Russian Ruble	Consumer
Kyrgyzstan †† [31]	Jan. 1992	Jan. 1992	Jan. 1992	157%	3.20%	22.3 days	Russian Ruble	Consumer

Kazakhstan ††[32]	Jan. 1992	Jan. 1992	Jan. 1992	141%	2.97%	24.0 days	Russian Ruble	Consumer
Austria [33]	Oct. 1921	Sep. 1922	Aug. 1922	129%	2.80%	25.5 days	Crown	Consumer
Bulgaria [34]	Feb. 1991	Mar.91	Feb. 1991	123%	2.71%	26.3 days	Lev	Consumer
Uzbekistan ††[35]	Jan. 1992	Feb. 1992	Jan. 1992	118%	2.64%	27.0 days	Russian Ruble	Consumer
Azerbaijan [36]	Jan. 1992	Dec. 1994	Jan. 1992	118%	2.63%	27.0 days	Russian Ruble	Consumer
Congo (Zaire) [37]	Oct. 1991	Sep. 1992	Nov. 1991	114%	2.57%	27.7 days	Zaïre	Consumer
Peru [38]	Sep. 1988	Sep. 1988	Sep. 1988	114%	2.57%	27.7 days	Indi	Consumer
Taiwan [39]	Oct. 1948	May.49	Oct. 1948	108%	2.46%	28.9 days	Taipi	Wholesale for Taipei
Hungary [40]	Mar.23	Feb. 1924	Jul. 1923	97.9%	2.30%	30.9 days	Crown	Consumer
Chile [41]	Oct. 1973	Oct. 1973	Oct. 1973	87.6%	2.12%	33.5 days	Escudo	Consumer
Estonia ††[42]	Jan. 1992	Feb. 1992	Jan. 1992	87.2%	2.11%	33.6 days	Russian Ruble	Consumer
Angola [43]	Dec. 1994	Jan. 1997	May.96	84.1%	2.06%	34.5 days	Kwanza	Consumer
Brazil [44]	Dec. 1989	Mar.90	Mar.90	82.4%	2.02%	35.1 days	Cruzado & Cruzeiro	Consumer
Democratic Republic of Congo [45]	Aug. 1998	Aug. 1998	Aug. 1998	78.5%	1.95%	36.4 days	Franc	Consumer
Poland [46]	Oct. 1989	Jan. 1990	Jan. 1990	77.3%	1.93%	36.8 days	Zloty	Consumer
Armania ††[47]	Jan. 1992	Feb. 1992	Jan. 1992	73.1%	1.85%	38.4 days	Russian Ruble	Wholesale
Tajikistan [48]	Oct. 1995	Nov. 1995	Nov. 1995	65.2%	1.69%	42.0 days	Tajikistani Ruble	Wholesale
Latvia [49]	Jan. 1992	Jan. 1992	Jan. 1992	64.4%	1.67%	42.4 days	Russian Ruble	Consumer
Turkmenistan ††[50]	Nov. 1995	Jan. 1996	Jan. 1996	62.5%	1.63%	43.4 days	Manat	Consumer
Phillipines [51]	Jan. 1944	Dec. 1944	Jan. 1944	60.0%	1.58%	44.9 days	Japanese War Notes	Consumer
Yugoslavia [52]	Sep. 1989	Dec. 1989	Dec. 1989	59.7%	1.57%	45.1 days	Dinar	Consumer
Germany [53]	Jan. 1920	Jan. 1920	Jan. 1920	56.9%	1.51%	46.8 days	Papiermark	Wholesale
Kazakhstan [54]	Nov. 1993	Nov. 1993	Nov. 1993	55.5%	1.48%	47.8 days	Tenge & Russian Ruble	Consumer
Lithuania [55]	Jan. 1992	Jan. 1992	Jan. 1992	54.0%	1.45%	48.8 days	Russian Ruble	Consumer
Belarus [55]	Aug. 1994	Aug. 1994	Aug. 1994	53.4%	1.44%	49.3 days	Belarusian Ruble	Consumer
Taiwan [57]	Feb. 1947	Feb. 1947	Feb. 1947	50.8%	1.38%	51.4 days	Taipi	Wholesale for Taipei

It is striking how few hyperinflations have occurred – only 56 as of 2013, when the Table was first constructed. However, at that time, there was probably a 57th hyperinflation. It likely occurred in North Korea during the 2009-2011 period. But, North Korea was not included in the Table because the only reliable price data from North Korea was for rice. So, the hyperinflation estimates were for rice price inflation, not for a general, broad measure of North Korean price changes.

Another striking feature of the Table is that Latin America, a region burdened with endemic inflation, only accounts for

seven of the original 56 hyperinflations. Those are: Argentina (1989), Bolivia (1984), Brazil (1989), Chile (1973), Nicaragua (1986), and Peru (1988 and 1990).

With this chapter, we amend the Table and add Venezuela to the Rogues Gallery of hyperinflations. Venezuela passed the hyperinflation threshold on December 3, 2016. Venezuela is the 57th country to meet the three criteria required to qualify as a hyperinflation. Venezuela is now in the "record book." It appears in the new, amended Hanke-Krus World Hyperinflation Table at the 23rd rank, with a peak monthly inflation rate of 221 percent recorded in November 2016. This puts Venezuela in between the USSR, which recorded a peak monthly inflation rate of 212 percent in February 1924 and Moldova, whose peak monthly inflation of 240 percent occurred in January 1992.

On the method and use of purchasing power parity to estimate Venezuela's inflation rate

Reliable official inflation statistics for Venezuela are not available. Indeed, from December 2014 until January 2016, the Banco Central De Venezuela did not report inflation statistics. The lack of reliable official inflation data is a "problem" that can be overcome, however. The most important price in an economy is the exchange rate between the local currency and the world's reserve currency – the U.S. dollar. As long as there is an active black market (read: free market) for currency and the black market data are available, changes in the black market exchange rate can be reliably transformed into accurate estimates of countrywide inflation rates. The economic principle of Purchasing Power Parity (PPP) allows for this transformation and the accurate estimates of countrywide inflation rates.

Jacob Frenkel's (1976) path-breaking work on the German hyperinflation established once and for all why, at high rates of inflation, the use of PPP yields very accurate inflation estimates (Manzur, 1990). Frenkel ran six regressions of the German mark-U.S. dollar exchange rate on various German price indices (Frenkel, 1976). The results of these regressions confirm

the theory of PPP and strongly support its application during hyperinflations. Indeed, Frenkel found a near one-to-one relationship between changes in exchange rate and price levels during the German hyperinflation. The chart below shows that tight linkage. McNown & Wallace (1989), as did Taylor & Taylor (2004), reinforced Frenkel's findings and confirmed that PPP held for countries that were experiencing elevated rates of inflation.

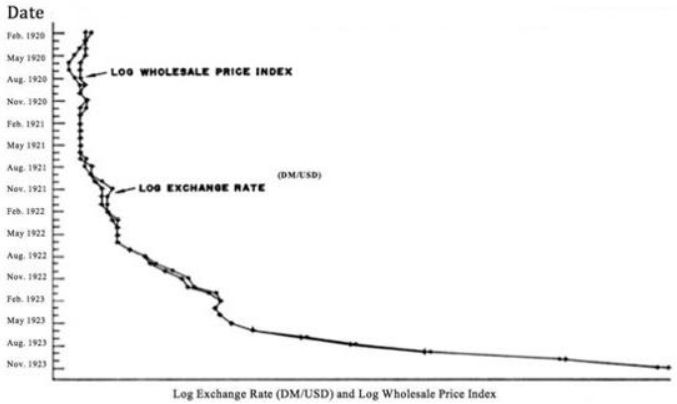

Figure 1. *The tight relationship between changes in the DM/USD exchange rate and German price inflation (Feb. 1920-Nov.1923)*
Source: Frenkel (1976).

Venezuela employs a multiple exchange-rate regime, coupled with exchange controls (Crooks, 2015). In consequence, the official exchange rates are not free-market rates. To obtain the free-market exchange rates required for the application of PPP, we use black-market exchange rates. Black-market rates are efficient processors of information when political and economic circumstances make the official exchange rate unreliable or irrelevant (Arbetman & Kugler, 1997). The course of the bolivar-U.S. dollar (VEF/USD) black-market rate is shown in the chart below. The value of the bolivar against the dollar has collapsed. PPP suggests that Venezuela is experiencing a dramatic inflation surge.

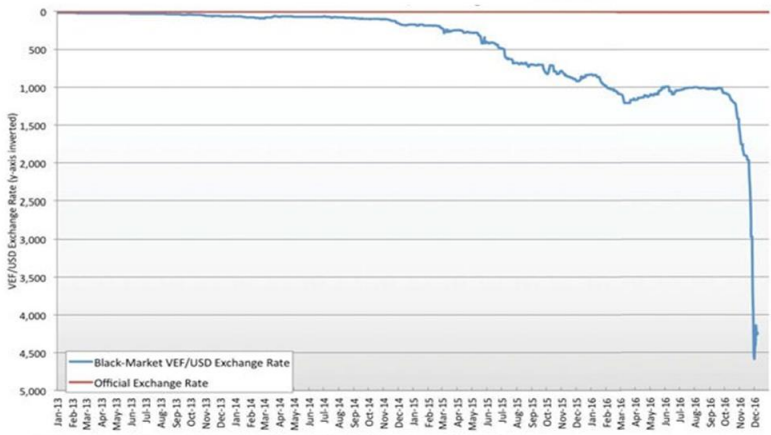

Figure 2. The fall in the value of the Venezuelan bolivar (The black-market VEF/USD exchange rate)
Source: Banco central de Venezuela, dolartoday.com, and IMF.

We can employ PPP to accurately transform changes in the bolivar's black-market exchange rate into accurate estimates of Venezuela's inflation. One form is Absolute PPP. It states that the price of a standard market basket of goods, when measured in a common currency, is the same in all countries because of international arbitrage (Manzur, 1993). Formally, this can be written as: $S=P/P^*$, where S is the spot market exchange rate, P is the price of the basket in domestic currency, and P^* is the price of the basket in foreign currency. With Absolute PPP, the Law of One Price holds. That is, all goods sell at the same price when converted into a common currency. But, three major factors can cause the Law of One Price not to hold in the short run. They are: transportation costs and barriers to trade; different speeds of adjustment in the foreign exchange market and goods markets; and differences in the composition of "market baskets" (Mahdavi, 1994).

The shortcomings of Absolute PPP can be overcome with the use of a second form of PPP: Relative PPP. It accounts for the factors that can cause deviations from Absolute PPP and adjusts for transaction costs and barriers to trade (Manzur, 1993). Relative PPP relates the percentage change in the exchange rate between two currencies to the inflation rate differential between two countries. It holds, even if Absolute

PPP does not (Mahdavi, 1994). Relative PPP can be written as: S'=P'-P*', where S' is the percentage change in the spot market exchange rate, P' is the percentage change in the price of the basket in domestic currency, and P*' is the percentage change in the price of the basket in foreign currency (Manzur, 1993).

We apply Relative PPP to calculate inflation in Venezuela. Let

PA = the Venezuela price level in bolivars,

PB = the United States price level in U.S. dollars, and

$S_{A/B}$ = the exchange rate (bolivars/ U.S. dollar).

Then, PPP in the absolute form states that:

$$\frac{P_A}{P_B} = S_{A/B}.$$

We can convert Absolute PPP to Relative PPP:

$$\frac{1+\frac{\Delta P_A}{P_A}}{1+\frac{\Delta P_B}{P_B}} = 1+\frac{\Delta S_{A/B}}{S_{A/B}}$$

We can then rearrange these terms to obtain the following relationship:

$$\frac{\Delta P_A}{P_A} = \left[\left(1+\frac{\Delta P_B}{P_B}\right)\left(1+\frac{\frac{\Delta S_A}{B}}{S_{\frac{A}{B}}}\right)\right] - 1.$$

Thus, if we know the U.S. inflation rate and the change in the exchange rate between the bolivar and the dollar over the given time period, we can calculate the inflation rate in Venezuela. In order to make the calculations, we use the Consumer Price Index for All Urban Consumers: All Items. This index is reported by the U.S. Bureau of Labor Statistics, and the black-market exchange rate for the bolivar against the dollar is reported by DolarToday.

Our calculations show that monthly inflation broke through the 50 percent threshold on November 3, 2016, when the black-market exchange rate deteriorated to 1682.12 VEF/USD. At that time, the monthly inflation rate in the U.S. was 0.125%. On November 3, 2016, Venezuela's monthly inflation was:

$$Inflation_{Venezuela} = \left[(1 + .00125)\left(1 + \frac{1682.12 - 1084.63}{1084.63}\right)\right] - 1 = 0.5528$$

Since inflation is expressed in percentage terms, monthly inflation on November 3, 2016 was 55.3 percent. The monthly inflation rate, as shown in the chart below, has continued to stay above 50 percent for each day since November 3, 2016.

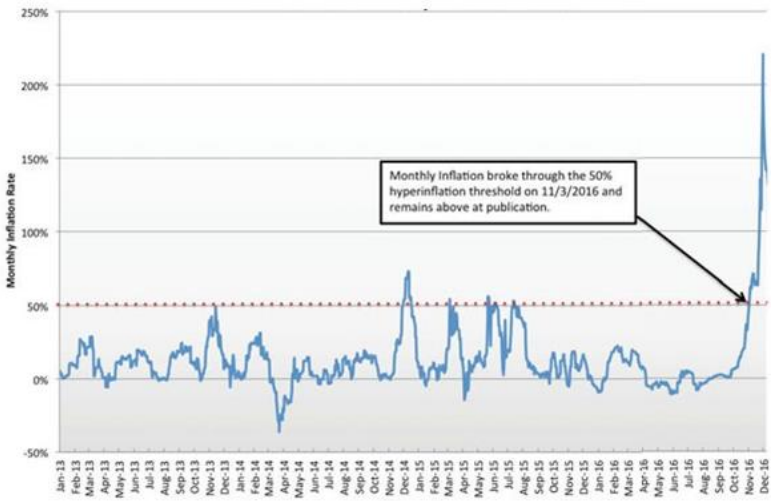

Figure 3. *Venezuela's monthly inflation rates*
Source: Banco central de Venezuela, dolartoday.com, and IMF.

Reflections on why purchasing power parity is powerful during hyperinflation

Versions of Purchasing Power Parity theory date back to the Salamanca School in 16th century Spain and the work of Gerard de Malynes in England in 1601 (Manzur, 1993). The theory was largely neglected until the Swedish economist Gustav Cassel

began an extensive investigation of exchange rates and price levels in the early 20th century (Manzur, 1993). Cassel's conjecture was that movements in exchange rates reflected movements in relative purchasing power. He plotted monthly changes in prices in different countries and compared those to movements in exchange rates during the same period. Countries with weaker currencies (read: stronger currency depreciations) suffered high rates of inflation. He found that the linkage between an increase in exchange-rate depreciation and increased inflation was tight. Cassel dubbed the theory the Purchasing Power Parity Doctrine (1916 and 1918). In a study of the relationship between the German mark's exchange rate and German inflation, Cassel found that Absolute PPP did not hold, and concluded that PPP is "one of the most intricate, most actual, and practically most important chapters of economic science" (Cassel, 1919).

Even though Cassel continued to embrace the Absolute Purchasing Power Parity Doctrine, his work opened the door for the development of Relative Purchasing Power Parity, which is the form we use to estimate inflation in Venezuela. It is this form of PPP, as applied to countries with elevated inflation rates, which provides the standard used by the economics profession. The reason is clear: in high-inflation countries, Relative PPP holds and yields very accurate results (For example, see: Frenkel, 1976; Mahdavi, 1994; Manzur, 1990; McKinnon, 1979; McNown & Wallace, 1989; and Taylor & Taylor, 2004). As Petrovic, Bogetic, and Vujošević put it: "At moderate rates of inflation, prices adjust to past inflation and currency depreciation does not play a prominent role. As inflation accelerates, currency depreciation becomes increasingly important for price adjustments," (Petrovic *et al.* 1999). Ronald McKinnon agrees and pointedly specifies Relative PPP as the standard for high-inflation countries: "The relative version of PPP performs most impressively, however, when inflation in a single country is extraordinarily high vis-a-vis the outside world," (McKinnon, 1979).

In concluding these reflections on Relative PPP, it is worth nothing that the empirical evidence shows that it holds in the "long run," when arbitrage has time to work its magic. The

debates on the topic always swirl around whether it holds in the "short run." This debate does not appear when hyperinflation is the order of the day. During a hyperinflation, the currency of the hyperinflating country is plunging in value rapidly and prices are soaring in lockstep. In these circumstances, a foreign currency becomes the reference unit of account, and the "short run" becomes the "long run" and vice versa. With this equivalence, Relative PPP holds, as it always does in the "long run," because the "long run" can occur in an hour.

To put this point into perspective, we use an illustration from Yugoslavia, where Hanke served as the adviser to the government of Ante Markovic in 1990-1991, and where he anticipated the great hyperinflation of 1992-1994 (Hanke, 2016). Compared to Venezuela's, Yugoslavia's hyperinflation was "great." The peak monthly rate of inflation in Yugoslavia was 313,000,000 percent. This is a daily rate of 64.4 percent. The comparable figures for Venezuela are only 221 percent per month and 4.0 percent per day.

To appreciate how the "short" and "long run" became one in Yugoslavia, consider how fast prices were changing, literally in front of Yugoslavs' eyes. A kilogram of potatoes was 4,000 dinars on November 10, 1993. The same kilo of potatoes went for 8,000,000,000,000,000 dinars two months later (Gordy, 1999). On January 16, 1994, one of Belgrade's prominent newspapers, Politika, reported that "yesterday [morning] the price of the [Deutsche] Mark on the black market was 2.0 million dinars, and around 3:00 p.m., it was 2.5 million dinars. Belgrade dealers were reluctant to sell marks, as they expected the exchange rate to reach 5 million dinars (per DM 1) by evening." Talk about speed and the compression of time periods.

Concluding remark

Venezuela, welcome to the record books. You have now entered the inglorious sphere of hyperinflation. It is a world of economic chaos, wrenching poverty, and death. Its purveyors should be incarcerated, and the keys should be thrown away.

Hanke-Krus World Hyperinflation Table Notes and Sources

- When a country experiences periods of hyperinflation that are broken up by 12 or more consecutive months with a monthly inflation rate below 50%, the periods are defined as separate episodes of hyperinflation.

- The currency listed in the chart is the one that, in a particular location, is associated with the highest monthly rate of inflation. The currency may not have been the only one that was in circulation, in that location, during the episode.

- We are aware of one other likely case of hyperinflation: North Korea. We reached this conclusion after calculating inflation rates using data from the foreign exchange black market, and also by observing changes in the price of rice. Based on our estimates, this episode of hyperinflation most likely occurred from December 2009 to mid- January 2011. Using black-market exchange-rate data, and calculations based on purchasing power parity, we determined that the North Korean hyperinflation peaked in early March 2010, with a monthly rate of 496% (implying a 6.13% daily inflation rate and a price-doubling time of 11.8 days). When we used rice price data, we calculated the peak month to be mid-January 2010, with a monthly rate of 348% (implying a 5.12% daily inflation rate and a price-doubling time of 14.1 days). All of these data were obtained August 13, 2012 from Daily NK, an online newspaper that focuses on issues relating to North Korea [Retrieved from]. We also acknowledge that our investigation was aided by reports from Good Friends USA, a Korean-American advocacy and research organization, as well as from Marcus Noland at the Peterson Institute for International Economics.

(*) The authors calculated Zimbabwe's inflation rate, from August to November 2008, using changes in the price of the stock, Old Mutual, which was traded both on the Harare and London stock exchanges. The stock prices yielded an implied exchange rate for Zimbabwe dollars, under purchasing power parity.

(†) The Republika Srpska is a Serb-majority, semi-autonomous entity within Bosnia and Herzegovina. From 1992 until early 1994, the National Bank of Republika Srpska issued its own unique currency, the Republika Srpska dinar.

(‡) Greece's inflation rate was estimated by calculating the drachma / gold sovereign exchange rate.

(§) The peak monthly inflation rate listed for China in the table differs from that presented in one of the authors' previous pieces on hyperinflation (Hanke & Kwok, 2009). This revision is based on new data from a number of sources, which were recently obtained from the Library of Congress in Washington, D.C.

(**) We calculated the Free City of Danzig's inflation rate using German inflation data, since the German papiermark was in circulation in Danzig during this time. It is worth noting that Germany and Danzig experienced different peak months of hyperinflation. This is case because the last full month in which the German papiermark circulated in the Free City of Danzig was September 1923. Germany continued to circulate the papiermark beyond this point, and subsequently experienced its peak month of hyperinflation (October 1923).

(††) The data for many of the post-Soviet countries were only available in the World Bank's Statistical Handbook: States of the Former USSR. In this publication, the authors stated that the data should be viewed with an extra degree of caution because the statistics were taken from the corresponding official internal government source and not independently reviewed by the World Bank. However, these statistics are official and are the only source of data available for the corresponding time periods for each country.

(***) We calculated PPP implied inflation for Venezuela using black-market exchange rate data from dolartoday.com.

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2 How the panic of 1907 passed Argentina by

Alexandra *Popkin*

Introduction

On the tail of a booming nineteenth century, in the early 1900s Argentina's economy was thriving. The country was a main exporter of agricultural products, welcomed European immigration, and began to advocate for social unity, all resulting in increased productivity, more liberal trade policy, and high investment (OECD, undated). According to many, in the early twentieth century, Argentina was the most prosperous Latin American country (Frankema & Visker, 2011: 71).In light of Japan's later rapid rise to prosperity and Argentina's steep relative decline, Simon Kuznets, a Nobel laureate in economics, is said to have stated, "there are four kinds of countries in the world: developed countries, undeveloped countries, Japan and Argentina" (*Economist*, 2014). (Kuznets meant that Japan was an undeveloped country that had become developed, while Argentina was a developed country that had become undeveloped.)

Argentina enjoyed generally strong economic growth in the late 1800s despite financial problems. In 1890 Argentina's

problems were the origin of a crisis that reached into the center of world finance, London. In the first quarter of 1890 the Argentine government had bailed out the federally owned Banco Nacional and the Banco de la Provincia de Buenos Aires, owned by Argentina's most important province. The bailout took the form of a new issue of government currency lent to the banks. The exchange rate, which was floating, depreciated about 20 percent. The government was also struggling with high interest payments, which amounted to about 40 percent of its revenues. The financial situation triggered a political crisis that included the resignation of the minister of finance in early July, an unsuccessful insurrection in late July, and resignation of the president in early August. Argentina suspended payments on its foreign debt. The British firm of Baring Brothers & Co., the world's largest merchant bank, had been heavily involved in underwriting Argentine securities, and held a substantial amount of them in its portfolio because it had been unable to sell them to other investors at a profit. In November 1890 Barings lacked the liquidity to pay depositors. The Bank of England quickly organized a rescue mission, which wiped out most of the stockholders' equity in Baring Brothers but prevented a financial crisis in London (Mokyr, 2003: 305).

Argentina was not so lucky: it suffered a recession. The 1890 crisis differed from the characteristic banking crises of the nineteenth century for one main reason: despite the decrease in the nominal stock of money following the collapse, there was simultaneously a growth in both the price level and the income velocity of money (read: ratio of real output to real cash balances). The reason velocity almost doubled was that the public, distrustful of the monetary system, increasingly hoarded gold and silver from 1887 onward. The blame for this situation should be placed upon the monetary authorities for failing to create a system where paper currency maintained its purchasing power. That is, the results of the expansionary monetary policy being conductedwere negated by the lack of an effective Standard (della Paolera & Taylor, 2001: 70).

In response to the crisis of 1890, the government more or less froze the stock of currency and established a body, the Caja de Conversión (translation: Conversion Office), eventually

intended to re-establish a rigid rate of exchange for the Argentine peso into gold (Law 2471). After the recession at the start of the decade, the Argentine economy grew again. In 1899, the combination of a frozen supply of currency and continued economic growth made the peso appreciate and the gold premium fall, a problem for those whose everyday transactions were dealt in gold: debtors who had contracted liabilities in gold, holders of securities for gold, and those who were paid in gold. Conversely, those who were paid in paper celebrated the increasing value of their money (U.S. Mint, 1909: 163).

This period became known as the Belle Époque, or Golden Age,and it lasted until 1914, the onset of the First World War. During this time, due to its strong growth, Argentina was one of the world's great emerging economies.Foreigners began to view Argentina as an ideal place to invest, and in no time Argentina's economy became one of those most rapidly expanding in the world (della Paolera & Taylor, 2001: 79). One impetus for the influx of foreign investment was that Argentina switched from a floating exchange rate to the gold standard. Real output rose and Argentina experienced mild inflation of the prices of domesticgoods (della Paolera & Taylor, 2001: 121). In the period following the Baring Crisis, the Argentine government devoted its resources to stabilization and economic growth, paving the way to becoming an actor in the web of world financial markets (della Paolera & Taylor, 2001: 80). This paper will not discuss in depth the Belle Époque period, except to say that it was beneficial to, and essential for, the recovery of the Argentine economy following the Baring Crisis (della Paolera & Taylor, 2001: 99).

Arguably the most notable law that emerged from this period was the Law of Conversion, or Law No. 3871, proposed to Congress by President Julio Roca. It received influential support from then-senator Carlos Pellegrini,who had been president during the Baring crisis. The law, whichpassed on October 31, 1899, made the Caja de Conversióninto a currency board. The purpose of the Law was to create gold standard convertibility, which the monetary authorities set at a rate of 2.27 paper pesos per gold peso (della Paolera & Taylor, 2001: 120). (The "gold peso" was the definition of the peso as 1.45161

grams of gold established by Law 1130 in 1881.) The Law of Conversion was composed of many sections, the first relating to the type of monetary regime that would be set up. By this article:

The Conversion Office would have the singular responsibility of exchanging paper for specie (and vice versa) at a rate of exchange fixed by law at 44 gold cents per paper peso. Thus, any expansion or contraction in the amount of cash in circulation would exactly match the variations in the level of specie reserves on hand at the Conversion Office. With such a system of 100 percent marginal gold backing for the currency, there was a strict and inelastic relationship between variations in the stock of metallic reserves and variations in the monetary base. Consequently, all key autonomous monetary policy functions were proscribed such as operating on the open market to buy or sell public bonds in order to influence the level of interest rates, or the use of rediscounts to provide liquidity. In addition, there could not be any other types of guarantees offered by the Conversion Office, such as the provision of Lender-of-Last-Resort assistance to the financial system. The money supply had been rendered completely endogenous by this choice of regime. (della Paolera & Taylor, 2001: 120)

Another key aspect of the Law was the level of independence granted to the Caja de Conversión. It was composed of a board of five directors appointed by the executive branch that had to be approved by the Senate, with five-year terms in order to keep the institution politically independent. This clause of the Law proved useful, for during this time the Caja de Conversión remained uninfluenced by the other institutions of government (della Paolera & Taylor, 2001: 120).

How was the rate of convertibility chosen? The Argentine government chose a rate of 44 per cent of the old gold parity, established in the 1880s, by "calculating the average premium on gold during the 6 months preceding the date of the conversion law, which was found to have been 127.2 per cent," that is, 1 gold pesos = 2.2272 paper pesos (U.S.Mint, 1909: 163).

The Argentine monetary system at this time comprised many different institutions. The Caja de Conversión, the focus

of this paper, issued notes (paper currency). Coins were issued by the mint. The Banco de la Nación Argentina, or the Bank of the Argentine Nation, succeeded the bankrupt Banco Nacional as the country's federally owned bank. It performed certain functions as a fiscal agent and as a politically influenced lender that in other countries were characteristic of central banks, although unlike a central bank it did not issue the monetary base. At this time there were also banks owned in whole or in part by the provincial governments, a bank owned by the city of Buenos Aires, locallyowned private banks, and multiple foreign banks (including the British-owned London and River Plate Bank and the Bank of Boston).

The panic of 1907: Worst in the United States, but felt around the World

The Panic of 1907 was a financial crisis that originated in the United States but affected many other countries. The tipping point in the United States was the failure of the Knickerbocker Trust Company on October 22 and the closure of several other New York City trust companies and banks. J.P. Morgan, America's leading financier, personally examined the assets of many of the troubled financial institutions in New York and organized a syndicate to rescue those he judged to be solvent.

The United States by this time was the world's largest economy, and New York was one of the world's major financial centers. Tight conditions in the New York money market brought about by the financial crisis affected European markets, and "by November 4, the Bank of England's [discount] rate would rise to seven percent, the highest since 1873" (Bruner & Carr, 2007: 113). Interest rates in France and Germany achieved similar levels soon after. George B. Cortelyou, appointed Secretary of the Treasury by President Theodore Roosevelt, once stated that there was "'severe pressure' on the money markets in those countries, and observed that the grave conditions were not 'localized in the United States'" (Bruner & Carr, 2007: 113; see also Johnson, 1908: 457). People in countries all over the world felt the effects of the crisis, including Europe, South America, Japan, and Egypt, where the public was

"dissatisfied with the comparatively small returns yielded by high-priced railroad and industrial stocks" (Johnson, 1908: 458). As we will see, though, the panic passed Argentina by, unlike the Barings crisis of 1890 and the international crisis that would occur when World War I broke out in 1914.

What is a currency board?

The purpose of a currency board is to maintain a fixed exchange rate of domestic currency to a foreign anchor currency. In the case of Argentina, its peso was pegged to gold in this era. The currency board's main responsibilitywasto maintain the gold standard by overseeing external convertibility of the currency (Nakamura & Zarazaga, 2001: 8).

An orthodox currency board is defined by three major features (see Hanke, 2002: 88). First, there must exist a fixed exchange rate with an anchor currency. For Argentina, the fixed exchange rate for the paper peso was 44 centavos of the 1881 gold peso by the Law of Conversion. Second, there must be full convertibility, meaning no restrictions on exchanging the currency, from either side. During the period under study here, no such restriction existed. Last, net foreign reserves must be 100 percent of the monetary base, at least at the margin. This implies that an orthodox currency board's monetary base and its foreign reserves change one-for-one.The Caja de Conversión had a fixed, unbacked issue of 293 million pesos, and beyond that amount its issues were supposed to be backed one-for-one by gold. (The Caja de Conversión's foreign reserves consisted only of metallic gold, which earned no interest. Unlike other currency boards it did not hold interest-earning securities denominated in gold-convertible foreign currencies. Accordingly, it had no possibility of using interest earnings to eventually cover the unbacked issue. Covering the unbacked issue would have required allocations from the government budget.)

Was the 1907-08 Caja de conversión an orthodox currency board?

We will determine the orthodoxy of the Caja de Conversión during the 1907-08 period by performing three different tests on the data obtained from the monthly statements for this period published in the *Boletín Oficial*.

Test #1: Domestic Assets

For a currency board to be considered orthodox, it is necessary that domestic assets are zero percent of total assets, or as close to zero as possible. (See Figure 1; data and sources for all graphs can be found in the accompanying spreadsheet workbook.) Commonly, a small amount of domestic assets is held by a currency board for payment of salaries and other expenses. The Caja de Conversión adhered to this standard. Domestic assets began at 1.16 percent of total assets in April 1907 and remained around that level until August 1907 when they increased to 1.25 percent. Similarly, they remained relatively constant for seven months until March 1908, when they dropped again to 1.19 percent. Even though the number spiked from late 1907 into early 1908, the level was close enough to zero throughout this period as a whole for the Caja de Conversión to satisfy this orthodoxy requirement.

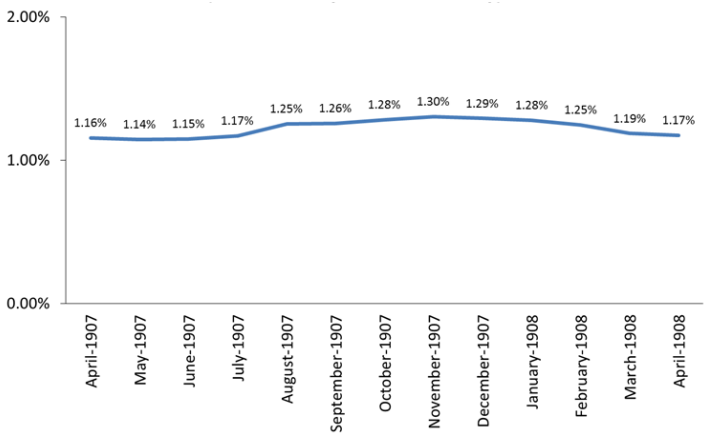

Figure 1. *Domestic assets as a percentage of total assets (0% = currency board orthodoxy)*

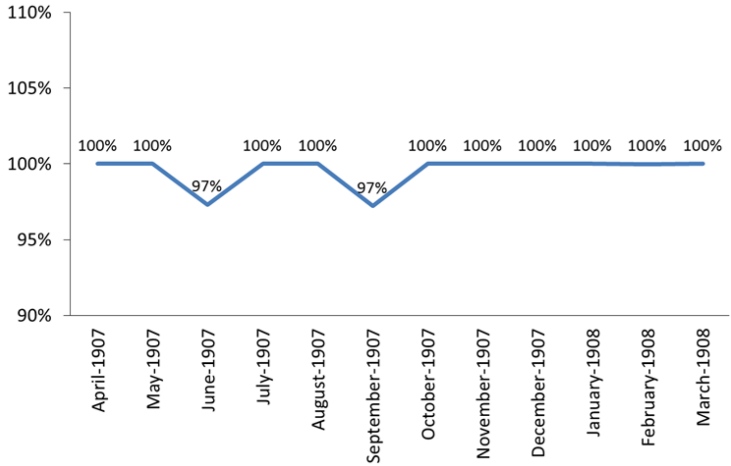

Figure 2. *Monthly reserve pass-through (%). (100% = currency board orthodoxy)*

Test #2: Reserve pass-through

The reserve pass-through ratio is the change in the monetary base divided by the change in net foreign assets (see Figure 2). For an orthodox currency board, this percentage should be as close to one hundred as possible. The reserve pass-through ratio is characteristically calculated on a year-over-year basis, but for this paper we calculated it on a monthly basis due to the frequency of the data being examined. For the data from 1907-08, the reserve pass-through ratio demonstrates the Caja de Conversión's orthodoxy, as the rate stays relatively constant around 100 percent.

Test #3: Change in the monetary base and net foreign assets as a percentage of the previous period's monetary base

Lastly, changes in the monetary base and net foreign assets as a percentage of the previous period's monetary base can also be used to prove orthodoxy of a currency board (see Figure 3). Again, many times these data are calculated on a year-over-year basis; however, for this paper we calculated them on a monthly basisdue to the short time frame studied. The percentages turned out to be the same for all of the months examined, apart

from June-July 1907 where the change in the monetary base as a percentage of the previous period's monetary base was-1.86 percent, while the change in net foreign assets as a percentage of the previous period's monetary base was -1.92 percent. The one discrepancy that stood out was for the last month studied, March-April 1908, where the first calculation was zero percent and the second was 1.21 percent.

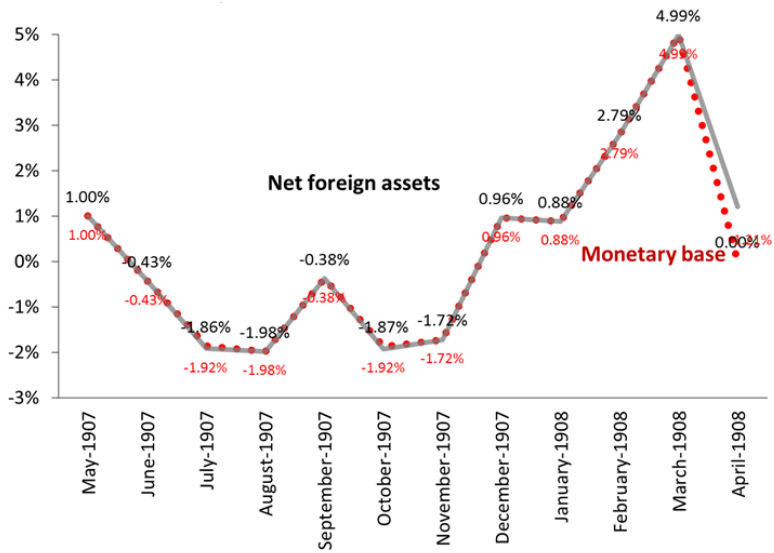

Figure 3. *Changes in monetary base and net foreign assets (% of previous period's monetary base)*

Gauge of economic performance during this period

Now that we have established that the 1907-08 Argentine Caja de Conversión was in fact an orthodox currency board, it is important to determine the effects, if any, this institution had on the economy of the country. The original reason for the implementation of the Caja de Conversiónwas to remedy the financial crisis caused by the shutdown of Barings in 1899. We are now going to look at the effects of the Caja.

One way to determine the effectiveness of the Caja de Conversión during the 1907-08 period is by examining certain

indicators. During the time the Caja was operating, the international economy experienced a high level of financial and monetary liquidity because of the amplified international stock of gold in the world (della Paolera & Taylor, 2001: 125). Additionally, the Argentine economy expanded during these years: from 1899 through 1914, the level of real output grew at an accumulated rate of 78.5 percent, or a compound rate of 5.2 percent a year. Additionally, the price level increased 36.3 percent over the fifteen-year period, ora compound rate of 2.4 percent a year (della Paolera & Taylor, 2001: 126). To establish a benchmark to the U.S., bank reserve ratios in the Argentine economy were three times higher than those of the U.S. (della Paolera & Taylor, 2001: 127).

In order to collect a first-hand account of the economic and political situation at this time, we reviewed *La Nación,* then as now Argentina's most highly reputed general-interest newspaper, at the beginning of the financial crisis. The first mention of the turmoil came on Wednesday, October 23, 1907, when the newspaper reported, "Gran alarma había producido esta mañana el anuncio hecho por el directorio del Mercantile National Bank previniendo a sus depositantes que las oficinas del Knickerbocker Trust se encargaban de arreglar sus respectivos créditos, en cuanto se sabía que dicho trust había recibido en depósito más de 60.000.000 de dólares. [...] La desmoralización de la Bolsa neoyorkina repercutió en las bolsas de las provincias y especialmente en las de Pittsburg y Filadelfia" (*La Nación*, 1908: 6). Roughly translated, the story said that "there was a great alarm at that morning's announcement by the board of the Mercantile National Bank warning its depositors that the offices of the Knickerbocker Trust were responsible forsettling their claims, as it was known that the trust had received more than $60,000,000. [...] The demoralization of the New York Stock Exchange impacted the markets of the provinces and especially those in Pittsburgh and Philadelphia."*La Nación* continued to report signs of the beginning of the U.S. financial panic, and only one week later, on October 30, 1907, the newspaper's section about the United States was entitled "La Crisis Financiera: Repercusión el comercio," or "The Financial Crisis: Impact on trade."

Translated, this article reports that, according to New Orleans telegraphic reports, the Louisiana Market and that of New Orleans have suspended their operations until the following June (*La Nación*, 1908: 5). On November 4, *La Nación* reported that the principal financial institutions had asked President Roosevelt to discuss the financial situation to reestablish public confidence. Clearly, the situation was worsening each day.

In order to build upon this first-hand account, we reviewed The *Review of the River Plate* from the first half of 1908.[1] The account shows that there was a period of turbulence in Argentina as a consequence of the problems the world was facing. Starting around October 15, 1907, the U.S. financial crisis began, and it affected Argentina for several months. As detailed in the *Review of the River Plate*on January 24, 1908, "Telegrams from Dallas (Texas) report that the banking institution there, known as the Western Bank Trust, has gone into liquidation" (*Review of the River Plate,* 1908). On February 7, it was reported that "the Oriental Bank of New York has closed its doors" (*Review of the River Plate,* 1908: 224), and in Argentina, "it is evident that the market is not quite certain what will be the result of the present political effervescence" and "banks show less interest and prices are a shade weaker" (*Review of the River Plate*, 1908: 245). The last week of February did not bring any progress, as "business in the stock and share market remains very dull, nor are there signs of any improvement in the near future" (*Review of the River Plate,* 1908: 535). (Argentine President José Figueroa Alcorta narrowly escaped an anarchist attempt to bomb himon February 28). However, as the Southern Hemisphere summer came to a close, the mood in Argentine financial marketsimproved, with the situation in New York: come April, "the Knickerbocker Trust Company resumed operation on the 26th ult., and the public now has full

[1]The *Review of the River Plate* wasa tri-monthly publication issued between 1892 and 1995 in Buenos Aires, detailing the country's economic performance over the specified time period. It is widely acknowledged as containing some of the shrewdest contemporary analysis of Argentina's economy. The *Review of the River Plate* from 1907 was unable to be used for analysis. The book is too brittle and even though it is currently held in the Library of Congress, patrons cannot use it because of its preservation status.

confidence in this institution" (*Review of the River Plate*, 1908: 865).

Other economic indicators

Below, Figures 4 and 5 show total gold in the banks and gold in the banks by sector, respectively. For most of the categories, data is only available starting in April 1907. It is clear that the amount of gold in "other national banks" (locally owned banks other than the Bank of the Argentine Nation) peaked in June 1907, while the amount of gold in other institutions remained constant. At this time, total gold in the banks increased as well, starting at approximately 30.32 million gold pesos in May 1907, soaring to 36.62 million gold pesos in June 1907, and leveling off at 35.53 million gold pesos in July 1907.

Figures 6 and 7 show the bank deposits from January 1907 through December 1908. Data for deposits in other "national banks" and foreign banks begin in April 1907, while data for the Bank of the Argentine Nation and total bank deposits begin in January 1908. From the total bank deposits, it can be seen that in 1908 financial institutions did not experience any major economic crises, as total bank deposits increased almost every month of the year. However, when deposits are broken down into different categories, a different story emerges. Deposits in "other national banks" and deposits in foreign banks move in the same direction, but the monthly change in deposits in foreign banks is much less volatile. The reason for the difference is unclear.

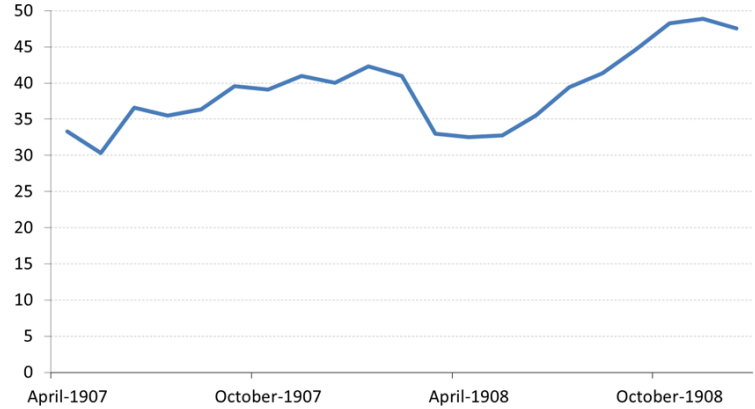

Figure 4. *Gold in the banks: Total (million gold pesos)*

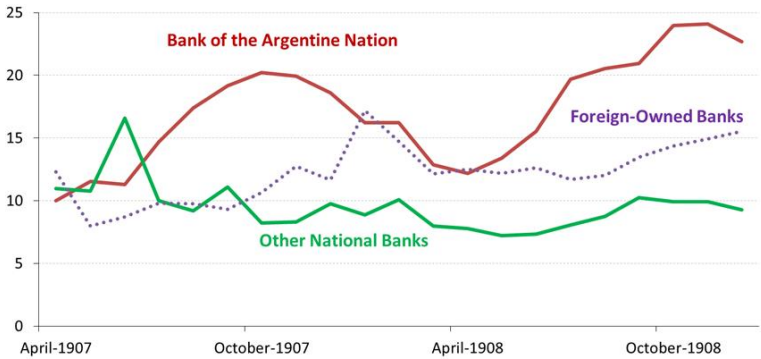

Figure 5. *Gold in the banks: By category (million godl pesos)*

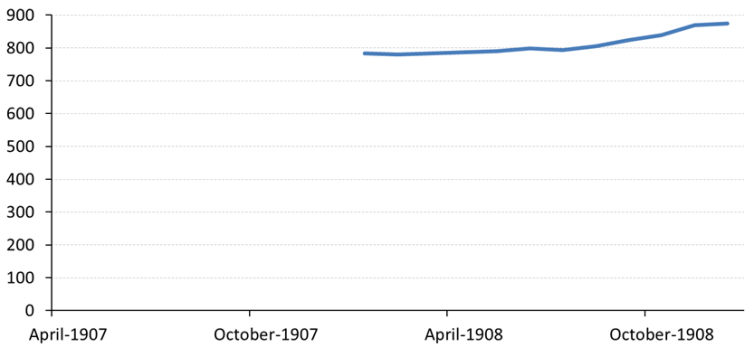

Figure 6. *Bank deposits: Total (million godl pesos)*

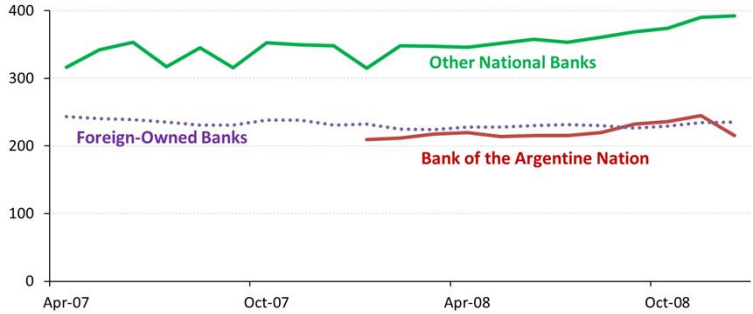

Figure 7. *Bank deposits: By categories (million godl pesos)*

Della Paolera & Taylor (2003) detail the progress of a variety of statistics relating to Argentina's 1907 economy. Industrial output was rapidly increasing in the early twentieth century, and this trend did not falter during 1907, totaling 179.12 (note: index 1900 = 100) (della Paolera & Taylor, 2003: 265). Another interesting statistic della Paolera and Taylor studied was the ratio to GDP of credit supply and money supply. For all banks, the 1907 ratio of 0.26 was similar to those of the previous and following years. The ratios of private banks and foreign banks to GDP also remained steady. The ratio of bank loans by Banco de la Nación Argentina to GDP was 0.07 and that of all U.S. banks to GDP was consistent at 0.39. Broad money for Argentina remained constant with a ratio of 0.4. However, 1907 was the last year that this ratio remained at a constant level in the U.S. and U.K. The broad money ratio for the U.S. to GDP was between 0.48 and 0.49 from 1902 to 1907, but in 1908 it rapidly increased to 0.56. Similarly, the broad money ratio for the U.K. to GDP was 0.52 in 1906 and 0.51 in 1907, but was significantly higher in the previous and following years (della Paolera and Taylor, 2003: 314).

Argentina's main exports at the time were wheat and wool, which together accounted for nearly half of all its exports by value. The newspaper sources previously mentioned and subsequent statistical compilations indicate that neither experienced more than the normal variation in prices in 1907-1908.

Conclusion

From the information collected, Argentina escaped spillover from the 1907 United States financial crisis. Figures 4, 5 and 6 show that the effects from the financial panic that hit the United States and some other markets were mild in Argentina, affectingat most only the first few months of 1908. However, Figure 7 demonstrates that bank deposits were choppy throughout most of 1907. Due to the lack of access of the 1907 *Review of the River Plate,* it is hard to form a definite conclusion.

It is clear, however, that the 1907-08 Argentine currency boardwas an orthodox one. The design of the Caja de Conversión, by Law No. 3871, created an independent entity, uninfluenced by the executive branch, that was responsible for the conversion of pesos into gold at the fixed rate of 44 per cent of the previous gold parity. The Caja was responsible for conversion of pesos on demand. The three keyorthodoxy conditions were satisfied by the Caja de Conversión at this time: domestic assets were around zero percent; the reserve pass-through ratio was nearly 100 hundred percent for all months; and the changes in the monetary base and net foreign assets as a percentage of the previous period's monetary base were equal for the majority of the months assessed.[2]

Afterword

Economic success followed the 1907-08 financial crisis. The Caja de Conversión continued its functions until the First World War began in 1914, halting Law 3871. However, during the Belle Époque, the fifteen years between the transformation of the Caja de Conversióninto a currency board and the First World War, Argentina became a leader in international trade and finance. Anannual report of the U.S. Mint remarked, "as regards[to] the staple industries of this country, they are now

[2] It is important to note that many of the conditions for orthodoxy are typically calculated on a year-over-year basis, whereas in this analysis they were calculated on a month-by-month basis. The reason they are usually calculated year-over-year is to reduce the statistical noise arising from monthly variance in expenses. This may affect the significance of the results; however, the calculations proved conclusive enough to study.

spread over such an immense area, which is being constantly enlarged, that the Republic maybe considered practically secure against such a general failure of production as to cause a derangement of the monetary system by the necessary outflow of gold in satisfaction of public and private obligations" (U.S. Mint,1909: 165). Though this pronouncement proved untrue in the long run, it shows the state of confidence in the banking system at the time.

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3 The currency board monetary system over 100 years in Bermuda (1915-2015)

John *Stanton*

Introduction

Before analyzing the history of Bermuda's currency board, it is useful to discuss the general history of currency boards and what a currency board is.

So, what is a currency board? The idea of a currency board originated in Great Britain in the early 1800s. An orthodox currency board issues notes and coins convertible on demand into a foreign anchor currency at a fixed rate of exchange. As reserves, it holds low-risk, interest-bearing bonds denominated in the anchor currency. Early currency boards also held some gold or silver. The reserve levels are set by law and are equal to 100 percent, or slightly more, of its monetary liabilities. By design, a currency board has no discretionary monetary powers; it operates as passive and automatic. The sole function of a currency board is to exchange the domestic currency it issues for an anchor currency at a fixed rate. Market forces determine the quantity of the domestic currency in circulation, most importantly, the demand for domestic currency (Walters & Hanke 1992).

Currency boards have existed in about seventy countries. The first currency board was installed in the British Indian Ocean colony of Mauritius in 1849. By the 1930s, they were widespread in British colonies. Currency boards have also existed in a number of independent countries and city-states, such as Singapore. The table below shows a list of recent currency boards and quasi currency boards.

Table 1. *Currency bords and currency board-like systems today*

Country	System Began	Exchange Rate	Population	GDP (in U.S.$)[a]
Argentina[b]	1991	1 peso = U.S.$1	37 million	$374 billion
Bermuda	1915	Bermuda$1 = U.S.$1	62,000	$1.9 billion
Brunei[b]	1952	Brunei$1 = Singapore$1	320,000	$5.4 billion
Bosnia[b]	1997	1 convertible mark = DM 1	3.5 million	$5.8 billion
Bulgaria[b]	1997	1 lev = DM 1	8.2 million	$34 billion
Cayman Islands	1972	Cayman$1 = U.S.$1.20	39,000	$930 million
Djibouti[b]	1949	177.72 Djibouti francs = U.S.$1	450,000	$530 million
Estonia[b]	1992	8 kroons = DM 1	1.4 million	$7.8 billion
Falkland Islands	1899	Falklands£1 = U.K.£1	2,800	unavailable
Faroe Islands	1940	1 Faroese krone = 1 Danish krone	41,000	$700 million
Gibraltar	1927	£1 = U.K.£1	29,000	$500 million
Hong Kong[b]	1983	Hong Kong$7.80 = U.S.$1	6.8 million	$168 billion
Lithuania[b]	1994	4 litai = U.S.$1	3.6 million	$18 billion

SOURCES: Hanke, Jonung, and Schuler (1993); Central Intelligence Agency (1999).
a. Expressed in terms of purchasing power parity, not at current exchange rates.
b. Currency board–like system.

Source: Hanke (2002).

History of Bermuda's currency board[1]

In the late 1700s the government of Bermuda apparently issued a small number of notes.[2] In the 1800s and early 1900s, though, there was no local issue of note or coins. Bermudians mainly used British currency. The government treasury issued notes from 1915 to 1930, followed by the Bermuda Currency Commission from 1915 to 1969. Bermuda continued to use British coins. The Bermuda Monetary Authority commenced in a legal sense in 1969 and became fully operational in 1970, from which time it also began issuing coins.

[1] This section describing the legislative history is largely drawn from Krus & Schuler (2014), 25-27.

[2] Bermuda, act of 1761 "for raising a sum of money for the use of His Majesty, his Heirs and Successors, as well as for the immediate arming and fitting out of two private vessels of war, &c.," cited in Chalmers (1893: 156-7).

The Bermudian pound was established as a unit of account equal to the pound sterling starting in 1842, well before the currency board was established on March 1, 1915. As in the United Kingdom, £1 was equal to 20 shillings (abbreviated "s.") or 240 pence (abbreviated "d."). The currency board initially issued notes of £1, but in later years the range of denominations extended from 2 shillings 6 pence to £10. British coins became unlimited legal tender by the Currency Act of July 1, 1861.

Starting on March 1, 1915, the Government of Bermuda began issuing notes thanks to the newly passed Government Notes Act, No. 5 of 1915. This act was passed because of a shortage of currency and uncertain financial conditions related to the outbreak of World War I (Bermuda Annual Report, 1915: 6). The act authorized the Bermudian government to issue up to 20,000 in £1 notes and made the notes legal tender. To give an idea of the scale of the note issue, the population in 1911 was 18,994, according to the census that year. Further notes would be printed in the following months. The act stated that "the notes under the authority of this Act shall be legal tender in these Islands for all purposes, and such notes shall be redeemable by the Government of these Islands at their face value at such times and in such manner as the Legislature shall hereafter determine." The legislation offered specifics about the offences in relation to Government notes. Forgery was a felony and person found guilty would be liable to imprisonment for five years. There were no specifics in the legislation regarding the kind of reserves that would be held.

British notes were also made legal tender under the Currency Act, No. 21, on August 3, 1915. The act declared it "expedient that British Currency of one pound and ten shilling notes should be made legal tender in these Islands." These were wartime notes issued by the British Treasury, as opposed to Bank of England notes, whose smallest denomination was £5. Previously, Bank of England notes had been customary tender, although not legal tender. U.S. dollar notes were also widely accepted because of the U.S. tourist trade (Bermuda Annual Report, 1915: 6).

On July 23, 1930, the Bermuda Currency Notes Act, No. 52, was enacted. This act reorganized the currency on a sterling

exchange standard with explicit 100 percent sterling backing for notes. Although in practice the system was already a sterling exchange standard, the 1915 law had established no minimum reserve requirement. Equally as important, the law established the Bermuda Currency Commission. There is no information on how many members the Currency Commission had or how they were appointed. This is interesting because it is unlike most currency board laws. In the absence of any specific information, the most likely possibility is that the Treasurer's office operated the Currency Commission. The next truly significant piece of legislation on the currency board, the Bermuda Currency Notes Act Amendment Act, No. 20, was passed on May 15, 1939. It allowed the governor of Bermuda to demonetize notes by proclamation and set an upper limit of 110 percent on reserves. In a response to wartime conditions, the Bermuda Currency Act, No. 21, was passed in September 1940 to make Bank of England notes legal tender for any amount. On August 4, 1965 the Currency (Bermuda Coin) Act. No. 172, authorized the Currency Commissioners to issue coins on a regular basis.

The Bermuda Currency Commission would last until February 6, 1970, when the Bermuda Monetary Authority (BMA) would replace it.

The Bermuda Monetary Authority Act, No. 57 of February 20, 1969, established the Bermuda Monetary Authority and changed the unit of account from the pounds-shilling-pence Bermudian pound to the decimalized Bermudian dollar. Initially the main function of the BMA was to give effect to an agreement whereby the British government largely guaranteed Bermuda's official sterling reserve from depreciation against the U.S. dollar (Bermuda Annual Report, 1994: 8). The Bermuda Monetary Authority published a balance sheet in 1969 but did not start issuing currency until February 6, 1970. Since the mid 1972 the system is best described as a quasi currency board. The Bermuda Monetary Authority differs from the Bermuda Currency Commissioners because it has been explicitly been authorized from the start to hold gold, securities in currencies other than sterling, and local assets.

On the day it took over responsibility from the ministry of finance for issuing the currency, the Bermuda Monetary Authority began issued a new currency, the Bermudian dollar. The Bermudian dollar was valued at Bermudian $2.40 = Bermudian £1. Because the dollar consisted of 100 cents and the pound consisted of 240 pence, the rate of conversion conveniently made 1 pence equal to 1 cent. Old currency, consisting of local sterling-denominated notes and British coins, was demonetized in June 1970 (Bermuda Annual Report, 1994: 8). The Bermudian dollar was introduced at an exchange rate making it equal to the U.S. dollar. The pound sterling at the time was pegged to the U.S. dollar.

From July 31, 1972 until May 21, 1981 the Bermudian dollar was worth 0.818513 grams gold (again, equal to US$1 at the time). The United Kingdom had floated the pound sterling on June 23, 1972, and in response, the governor of Bermuda ordered on July 28, 1972 that the new parity of the Bermudian dollar would be 0.818513 grams of fine gold, equal at the time of the U.S. dollar (BMA Annual Report 1994: 8). It was thought to be advantageous to make the Bermudian dollar equal to the U.S. dollar because of the importance of American tourists to the economy. In the weeks after the pound sterling floated in June 1972, the Bermudian dollar became worth more than the U.S. dollar. This was a disadvantage not only to American tourists, but also to local retailers. Bermuda therefore in effect switched to the U.S. dollar as the anchor currency because of its strong trade and financial links with the United States (Bermuda Monetary Authority annual Report, 1994: 8).

May 22, 1981, the Bermudian Dollar Parity Order was passed. It established the Bermudian dollar as "equivalent to one dollar in the currency of the United States of America" and ceased all references to gold. Thereafter, the Bermudian dollar has remained equal to the U.S. dollar to the present day (BMA Annual Report 1994: 10).

After Bermuda left the sterling area and switched to the U.S. dollar as its anchor currency in mid 1972, it retained exchange controls against the U.S. dollar to prevent capital flight that otherwise would have occurred because of a ceiling of 7 percent on interest rates, imposed by Bermuda's Interest Act of 1861.

This and other changes described below made Bermuda's monetary system no longer an orthodox currency board.

The data and our tests

We transcribed annual balance sheet data on the government note issue, the Bermuda Currency Commission, and the Bermuda Monetary Authority from 1915 to 2014. The main source for the government note and Currency Commission periods was the *Bermuda Gazette,* with additional information being gathered from Bermuda's *Blue Book* (statistical abstract) and the colonial report published by the British government based on the Blue Books and other information supplied by colonial administrators. The main source for the Bermuda Monetary Authority period was the annual reports of the BMA. No balance sheet data were available for 1973 because we could find no annual report for the BMA, or any statement in the *Bermuda Gazette*. We wrote to the BMA to see if they had the 1973 annual report but received no response. Some earlier statements are also missing, either because the *Gazette* did not publish data or because we could not find the relevant issues of the *Gazette* at the Library of Congress, where we searched for primary source material. We also performed tests on the balance sheet items of the Bermuda Currency Commission and the BMA. It should be mentioned that it is harder to distinguish domestic assets from foreign assets in the BMA balance sheet than it is in the Currency Commission balance sheet. Hence, there is a greater chance of erroneous calculations based on misclassification of assets.

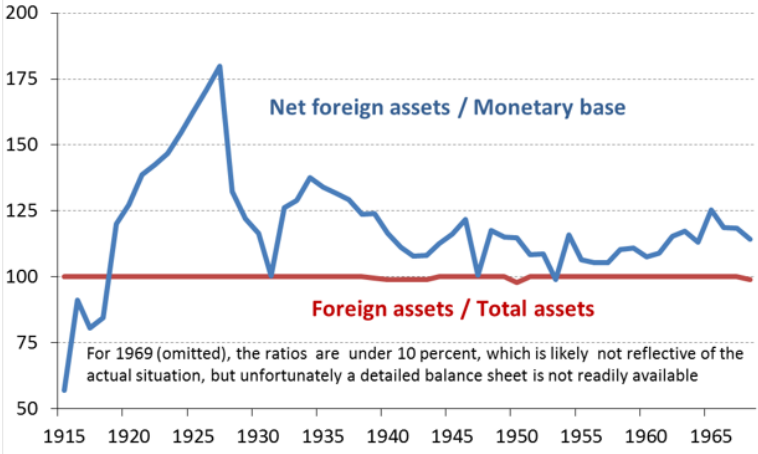

Figure 1. *Foreign asset ratios 1915-1968 (%)*

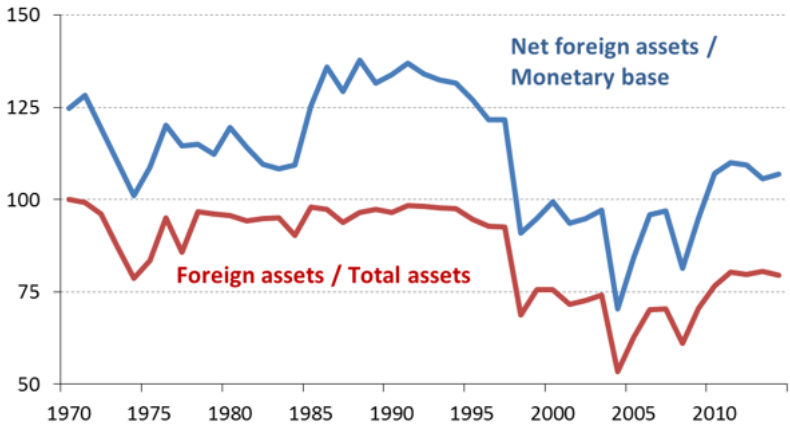

Figure 2. *Foreign asset ratios 1970-2014 (%)*

Test #1: Foreign assets, domestic assets, and the monetary base

Figures 1 and 2 show foreign assets as a percentage of the monetary base. In an orthodox currency board system, the percentage of net foreign assets to the monetary base is at least 100 percent. There is also an upper bound, typically no greater than 115 percent. This provides a cushion to maintain reserves of 100 percent should interest-earning assets fall in value, but prevents sterilization of capital inflows. Another point to note

is that for an orthodox currency board, domestic assets should be close to zero.

We compiled balance sheets from 1915 until 2014 to test whether the Bermuda Currency Board had full reserve backing. The financial statements from 1915 to 1931 as originally published do not show foreign deposits and certain other assets. From 1932 onward these statistics appear in the *Gazette,* and they seem to list all assets. It is important to keep in mind however that the *Gazette* typically only lists notes in circulation and omits net worth on the liability side. The BMA balance sheets, on the other hand, are fully balanced, showing assets equal to liabilities.

Where data were unavailable and interpolation seemed reasonable, we interpolated based on prior and subsequent data. There are two different graphs below showing the percentage of assets in reserve to the local notes in circulation below: one for 1915-1969, the government issue-Currency Commissioners / pounds-shilling-pence period, and the other since 1970, the Bermuda Monetary Authority / dollar period.

From 1915-1968, Bermuda was the epitome of an orthodox currency board. During that period, as seen in Figure 1, the percentage of foreign assets to the monetary base hovered at the 100 percent mark (the lowest point being 99.8 percent), an indication of an orthodox currency board. The year 1969 has been omitted because of the balance sheet change and the difficulty of disentangling foreign from domestic assets in that year's balance sheet. It should also be noted that most of the assets in the balance sheets in 1969 were classified as domestic, although they were probably foreign. Unfortunately, details are lacking, though the high ratios of foreign assets in the 1968 and 1970 balance sheets suggest that it is unlikely that the ratios plunged for 1969 only to recover the next year.

On July 25, 1970, Bermuda changed its unit of account from the pound to the dollar. The Bermudian dollar, although equal to the U.S. dollar, was defined in terms of the pound sterling as its anchor. On June 30, 1972, the Bermuda Monetary Authority Act 1969 was amended to allow the parity of the Bermuda dollar to be defined in terms of any currency or gold, not just sterling as before (BMA Annual Report 1994: 8). On September 1974,

1973, the 1968 agreement with the British government that largely guaranteed sterling reserves from devaluation against the U.S. dollar expired. Within a little over a month, the proportion of sterling in the BMA's reserves fell from 65 percent to less than 13 percent (BMA Annual Report 1994: 9). By 1974 the BMA's foreign assets had fallen to 79 percent of total assets, as Figure 2 shows. Domestic assets correspondingly rose from 4 percent in 1972 to 21 percent in 1974. Because we were unable to locate copies of the 1973 and 1974 BMA annual reports, we could not find what the BMA said about the reasons for this change. (The 1975 annual report has balance sheet data for 1974 but commentary only on 1975.) The percentage of foreign assets to total assets never again reached the 100 percent mark after 1970, and often it has been at about 80 percent or below, suggesting that the BMA has functioned as a quasi currency board, whereas the Commissioners of Currency were more orthodox.

Test #2: Reserve pass-through

Another test for orthodoxy is a reserve pass-through test. It measures year-over-year change in the monetary base divided by year-over-year change in net foreign reserves. Measuring on a year-over-year basis tends to eliminate any seasonal effects and diminish the important of one-time events such as extraordinary distributions or retentions of profit. For an orthodox currency board, reserve pass-through should typically be close to 100 percent—in practice, within the 80-120 percent range (Hanke, 2008: 58).

Bermuda's reserve pass-through fluctuated quite frequently beyond those limits, as Figures 3 and 4 show. There are a number of reasons for the fluctuations. The Commissioners of Currency omitted from its published financial statements some less important items that would have been published in comprehensive balance sheets. For some early years, notes in circulation remained unchanged while the currency board was earning interest on some of its assets. Such cases illustrate a shortcoming of the reserve pass-through test, which is that it works better when there is substantial change in the monetary

base, on the order of a few percentage points a year or more, than when change is small or absent.

It is also important to mention that in the BMA balance sheet it is much harder than in the currency board balance sheet to distinguish foreign from domestic assets, so the results in Figures 2 and 4 for the BMA period are less certain than they are for the Currency Commission period. We could not find data for 1973 because we could not locate a copy of the BMA's annual report for the year, so we interpolated the data.

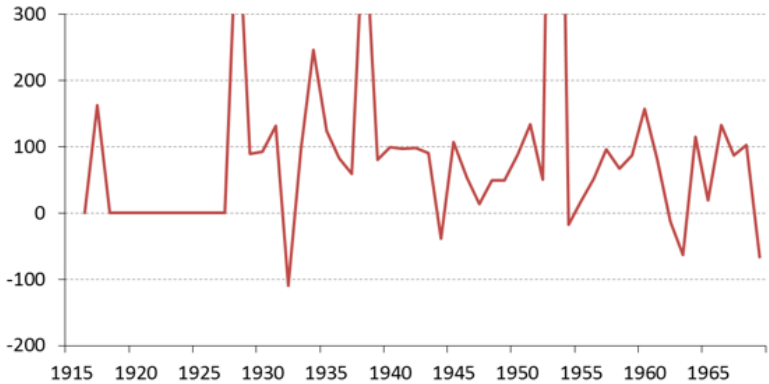

Figure 3. *Reserve pass-through, 1915-1969 (%)*

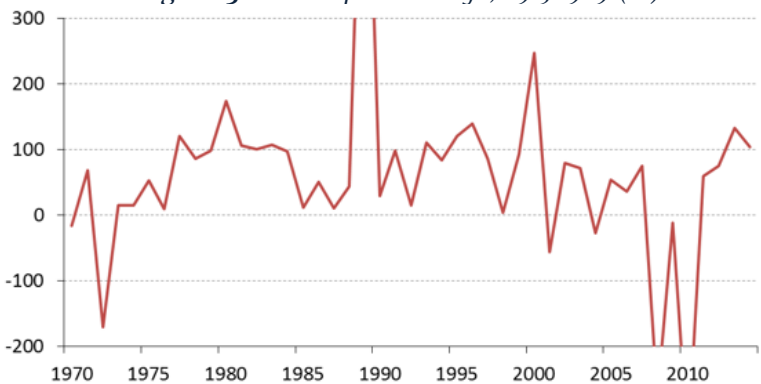

Figure 3. *Reserve pass-through, 1970-2014 (%)*

Test #3: Comparison of the absolute change in the monetary base to the absolute change in net foreign assets

Comparing the pound (or dollar) change in the monetary base to the pound (or dollar) change in net foreign assets is good for helping to identify situations where the reserve pass-through ratio is fluctuating because of a small numerator or a small denominator. Those situations need not represent deviations from currency board orthodoxy. The reader can see from Figure 5 that 1969 was a strange year. As mentioned above, the BMA was established in 1969, and one of its first decisions was to change the unit of account from the pounds-shilling-pence Bermudian pound to the decimalized Bermudian dollar. With this change in organization, and therefore the change in the balance sheet, it was difficult to disentangle foreign from domestic assets that year. It should also be noted that most of the assets in the balance sheets in 1969 were classified as domestic, although they were probably foreign. This is the reason for the significant increase in net foreign assets as shown in Figure 5.

Bermuda's current economy[3]

Bermuda's ties to U.S. businesses and U.S. tourism have led Bermuda to maintain the Bermudian dollar equal to the U.S. dollar. Bermuda's luxury tourist facilities attract around 360,000 visitors annually, causing its tourist industry to account for 28 percent of GDP.

The Bermuda Overseas Investment Tax Amendment Act, No. 9 of 1986 converted the tax on investments into a tax on foreign currency, with the exceptions of travel, personal imports and other purposes (Krus & Schuler, 2014: 27). This has caused international business to blossom, as it contributes to over 60 percent of Bermuda's economic output. A failed independence vote in 1995 can partially attributed to Bermuda's fears of scaring away its foreign firms. More than 12,500 foreign companies have a legal presence in in Bermuda,

[3] The data in this section are taken from Forbes' *Bermuda's Economy*.

many U.S. owned. This can be attributed in part to the Bermudian dollar being pegged against the U.S. dollar and the resulting confidence it inspires in the currency.

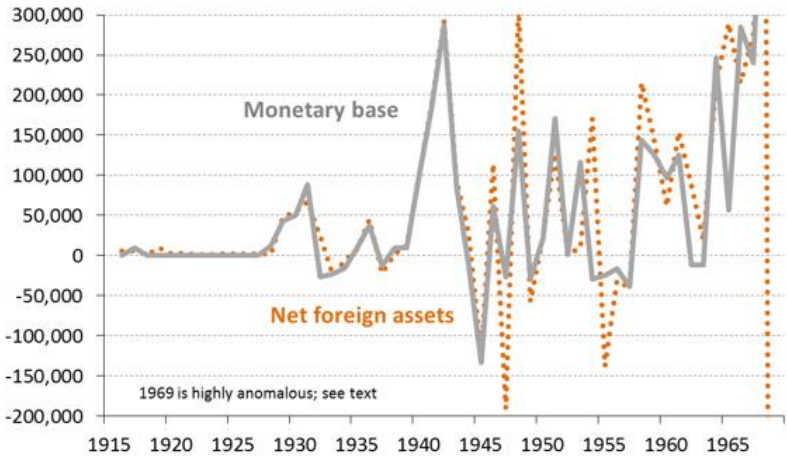

Figure 5. *Absolute changes, 1915-1969 (B£)*

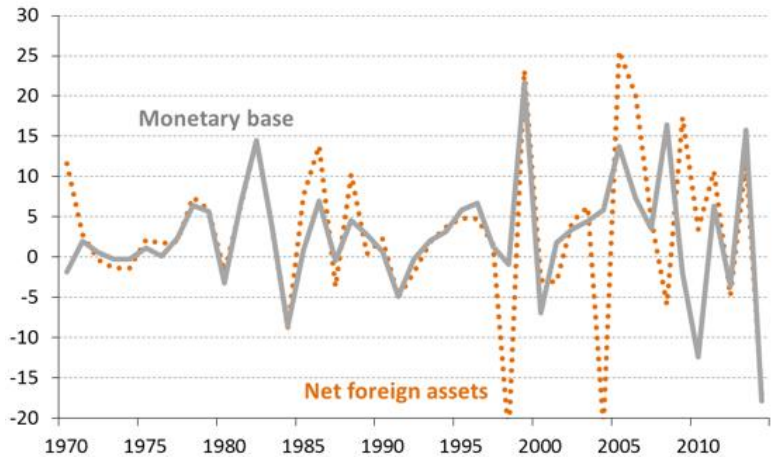

Figure 6. *Absolute changes, 1970-2014 (B£)*

Bermuda's exchange control [4]

Bermuda's currency board is an interesting case because there is no other currency board or currency board-like system that has had long-term exchange control into the anchor currency.

In 1939 Bermuda introduced exchange controls shortly after World War II broke out in Europe (BMA Annual Report 1990: 30). Controls were applied to transactions outside the sterling area and did not affect the free exchangeability of Bermudian currency into the pound sterling. Therefore the currency board remained orthodox.

After Bermuda left the sterling area and switched to the U.S. dollar as its anchor currency in mid 1972, it retained exchange control to prevent capital flight that otherwise would have occurred because of a legally imposed ceiling of 7 percent on interest rates, imposed by the Bermuda Interest Act of 1861. Hence the system was no longer an orthodox currency board. The Bermuda Monetary Authority assumed responsibility for exchange control (BMA Annual Report, 2008: 4); formerly, the Ministry of Finance had been responsible. In 1974 it should be noted that an amendment to the Bermuda Monetary Authority Act gave the BMA further responsibility for exchange control (BMA Annual Report 1994: 9).

In 1980, the BMA raised the amounts of foreign currency that Bermudians could purchase for travel and school fees abroad, to take account of the effects of inflation previous years. On the other hand, it tightened limits on overseas investment, by setting a quarterly rather than an annual maximum amount (BMA Annual Report 1980: 12). The quarterly restriction was removed at the end of June 1981 (BMA Annual Report 1994: 10). Exchange control regulations required that local transactions be in Bermuda dollars. The 1982 annual report defends exchange control as preserving Bermuda's international business reputation by providing for screening of

[4] This section describing Bermuda's exchange control is largely drawn from Krus & Schuler (2014: 29).

new companies and subsequent transfers of shares involving nonresidents (BMA Annual Report, 1982: 15).

Finally, in 1987, exchange controls were relaxed. An example of this was an increase in the travel allowance from Bermuda was increased from $3,000 per person per trip to $5,000 (BMA Annual Report, 1987: 20). The loosening of exchange controls would continue in 1993 and 1996 as well. In 1993, the Bermuda Monetary Authority claimed that Bermuda's exchange controls could now be fairly described as a system of capital controls (BMA Annual Report, 1993: 27-28), implying that previously, controls could be said to have applied to certain current-account transactions also. On December 1, 1996 there was a further loosening of exchange controls. Bermuda residents were permitted to borrow in foreign currency to refinance residential property in Bermuda (BMA Annual Report, 1996: 5, 32).

Bermuda's financial center [5]

Bermuda in recent decades has risen to become a global financial center, especially in the insurance sector. To state the facts, Bermuda re-insurers make up about 36 percent of the global reinsurance markets based on property/casualty net premiums earned, according to A.M. Best Co. Bermuda is also the largest center for captive insurance in the world, with over 1,200 captive insurance companies alone. Bermuda can also claim to the top spot for offshore financing. At least 13 of the world's top 40 reinsurers are based in Bermuda. Bermuda also remains the world's number one captive domicile overall. The bulk of Bermuda's captives are U.S.-owned entities, often used to insure and reinsure retentions on general liability, auto liability, workers compensation, and property.

It is interesting that Bermuda is such a large player in the insurance industry despite its small size as a territory (20.6 square miles with a population of roughly 65,000 people). If Bermuda is at a financial disadvantage due to its size, what are

[5] The facts in this section are taken from Forbes' *Bermuda's Banking Scenario* and Forbes' *Bermuda's Advantages for International Insurance Companies Registration*.

the advantages it has that have enabled it to develop a financial center?

First, a U.S. (or other) company that incorporates in Bermuda does not have to pay corporate income taxes on money earned outside the United States because of a tax treaty (embodied in Bermudian law in the U.S.A.-Bermuda Tax Convention Act, 1986). A U.S. firm can also borrow money from a Bermuda umbrella company, but the interest it pays, which is a tax write-off, goes back to the parent.

Being a British territory is another advantage. With the stability of the British legal tradition, foreign investors feel safe conducting business with Bermuda. (In fact, most of the world's most notable offshore financial centers other than Luxembourg have legal systems based in British law: Hong Kong, Singapore, the Cayman Islands, the Bahamas, the Channel Islands, Gibraltar, and Bemuda.) There is confidentiality with privacy. Policyholders do not need to disclose the existence of the policy to any entity. Therefore, insurance policies are generally exempt from disclosure because they are recognized as a contractually based agreement between the individual and an insurance company and not as a financial account. Unless directed by the Bermuda government, it is required by Bermuda law to withhold all information relating to any policyholder or policy regardless.

A stable currency is another advantage. By being pegged to the U.S. dollar, people do not have to worry about the currency being volatile. People are also reassured the Bermudian government won't try to use monetary policy to take wealth from them.

Another reason for Bermuda's success is that is that insurers in most countries cannot accept premium payments other than in local currency. Under certain circumstances, Bermudian insurance companies can structure policy to allow the contribution of premiums to be made in kind. This offers significant flexibility for clients who have the need for the advantages of various types of insurance policies yet choose not to liquidate significant assets to acquire insurance benefits.

The Bermuda Monetary Authority has evolved since the days of its creation. The BMA has changed from mainly a

monetary agency to predominantly a financial regulatory agency. Its monthly Assessment and Licensing Committee (ALC) reviews insurance applications. The BMA maintains an effective regulatory framework that meets relevant international standards while fostering an environment that remains attractive to business that enables growth.

While Bermuda is known for its offshore international insurance companies, it is not an international banking center. There are only four banks allowed by island laws to operate in the local market. The four banks are HSBC Bank of Bermuda Limited, Bank of N. T. Butterfield and Son Limited, Bermuda Commercial Bank Limited (BCB), and Clarien Bank Limited. HSBC Bank of Bermuda Limited, established in 1889 and formerly known as Bank of Bermuda Limited, is the largest and most profitable Bermudian bank. It accounts for about 47 percent of the local banking market. Bank of N. T. Butterfield and Son Limited is the oldest and second-largest bank on the island. It accounts for 40 percent of the banking market.

Bermuda has apparently never suffered a financial crisis during the last century besides the affair of the Bermuda Provident Bank, a small bank that was near failure in 1978 when it was taken over by the Bermuda Monetary Authority (BMA Annual Report, 1978: 5). However, Dr. Marcelo Ramella, a researcher at the Bermuda Monetary Authority, has said the global financial crisis of 2008 hit Bermuda harder than the rest of the world. At a speech at the Royal Hamilton Amateur Dinghy Club in 2013, Dr. Ramella said that Bermuda's and any economy's "concentration on one sector of the economy makes you vulnerable." He suggested that Bermuda needed to bring in more hard currency to boost GDP and pay off debt (Royal Gazette, 2013). Dr. Ramella's suggestions seem to have been heard, as the BMA's foreign assets rose from roughly B$143 million to B$153 million in 2013.

Conclusion

The history of the Bermuda currency board (established in 1915) was rather uneventful until 1970, when the Bermudian pound was substituted for the Bermudian dollar and thus

decimalizing the currency. Since 1972 when the Bermudian dollar was officially pegged against the U.S. dollar, Bermuda has operated as a quasi currency board. Bermuda's monetary stability seems to have been one factor, though not necessarily a big one, in the territory's development as an important offshore financial center, especially for insurance. The financial system has not experienced any episodes of general panic over the last 100 years and few troubles of any kind.

Appendix

Appendix A. Legislative History of Bermudian Note Issue, 1915-2006[6]

- Bermuda, Government Notes Act, No. 5, 19 February 1915: Established government note issue.
- Bermuda, Currency Act, No. 21, 3 August 1915: Made government notes legal tender.
- Bermuda, Currency Act, No. 21, 3 August 1915: Made government notes legal tender.
- Bermuda, Government Notes Redemption Act, No. 22, 3 August 1915: Established the Bermuda Investment Trustees to supervise the invested assets backing government currency notes.
- Bermuda, Government Notes Redemption Act, No. 9, 10 March 1917: Authorized an issue of £10,000 in £1 notes.
- Bermuda, Government Notes Act, No. 16, 18 June 1920: Authorized emergency notes of 2.5 shillings (not issued) and 5 shillings to combat a shortage of silver coin.
- Bermuda, Currency Act, No. 40, 28 December 1920: Notes that have been demonetized in the United Kingdom may be demonetized in Bermuda by proclamation of the governor.
- Bermuda, Government Notes Act, No. 15, 8 April 1927: Authorized a new note design.
- Bermuda, Bermuda Currency Notes Act, No. 52, 23 July 1930: Reorganized the currency on a sterling exchange standard with explicit 100 percent sterling backing for notes. Established the Bermuda Currency Commissioners.
- Bermuda, Bermuda Currency Notes Act, No. 40, 8 November 1935: Authorized 5-shilling notes.
- Bermuda, Bermuda Currency Notes Act Amendment Act, No. 20, 15 May 1939: Allowed the governor to demonetized notes by proclamation; set an upper limit of 110 percent on reserves.
- Bermuda, Currency Act, No. 21, 14 September 1940: Made Bank of England notes legal tender for any amount. (A response to wartime conditions.)
- Bermuda, Bermuda Currency Notes Act, No. 26, 18 June 1941: Authorized £5 notes.
- Bermuda, Special Coin (Commemorative) Act, 1958: Authorized commemorative coins.
- Bermuda, Bermuda Currency Notes Act, No. 191, 16 December 1963: Authorized £10 notes.
- Bermuda, Currency (Bermuda Crown) Act, 1964: Authorized a commemorative crown coin.
- Bermuda, Currency (Bermuda Coin) Act, No. 172, 4 August 1965: Authorized the Bermuda Currency Commissioners to issue coins on a regular basis. 27
- Bermuda, Bermuda Monetary Authority Act, No. 57, 20 February 1969: Established the Bermuda Monetary Authority and changed the unit of

[6] This list is taken from Krus and Schuler (2014: 26-27).

account from the pounds-shilling-pence Bermudian pound to the decimalized Bermudian dollar.

- Bermuda, Exchange Control Act, No. 109, 1972: Established exchange controls applicable even with the anchor currency.
- Bermuda, Exchange Control Regulations, Statutory Rules and Orders No. 21, 1 May 1973: Gave details of exchange controls.
- Bermuda, Bermudian Dollar Parity Order, 22 May 1981: Established the parity of the Bermudian dollar as "equivalent to one dollar in the currency of the United States of America" and ceased reference to gold.
- Bermuda, Overseas Investment Tax Amendment Act, No. 9, 1986: Converted the tax on foreign investment into a tax on the purchase of foreign currency, with exceptions for travel, personal imports, and some other purposes.
- Bermuda, Bermuda Monetary Authority Amendment Act, No. 27, 24 July 2006: Made a number of minor changes to the law on the Bermuda Monetary Authority.
- There do not seem to have been any relevant legislative enactments since 2006.

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4 The Cayman currency board, an island of stability

Steve H. ***Hanke*** & Edward ***Li***

The Cayman Islands and Hong Kong are two of the world's great financial centers. They both owe a great deal of their success to the fact that they employ currency boards. Their currency boards allow them to issue the Cayman and Hong Kong dollars. Both of these domestic currencies are, in fact, clones of the mighty U.S. dollar—the world's dominant international currency.

Currency boards have existed in over 70 countries. The first one was installed in the British Indian Ocean colony of Mauritius in 1849. By the 1930s, currency boards were widespread among the British colonies in Africa, Asia, the Caribbean, and the Pacific islands. They have also existed in a number of independent countries and city-states, such as Danzig and Singapore. One of the more interesting currency boards was installed in North Russia on November 11, 1918, during the civil war. Its architect was none other than John Maynard Keynes, a British Treasury official responsible for war finance at the time.

Countries that have employed currency boards have delivered lower inflation rates, smaller fiscal deficits, lower debt levels relative to their gross domestic product, fewer banking crises, and higher real growth rates than comparable countries that have employed central banks.

So, just what is a currency board? An orthodox currency board issues notes and coins convertible on demand into a foreign anchor currency at a fixed rate of exchange. As reserves, it holds low-risk, interest-bearing bonds denominated in the anchor currency and typically some gold. The reserve levels (both floors and ceilings) are set by law and are typically kept between 100 and 120 percent of its monetary liabilities (notes, coins, and, if permitted, deposits). A currency board's convertibility and foreign reserve cover requirements do not extend to deposits at commercial banks or to any other financial assets. A currency board generates profits (seigniorage) from the difference between the interest it earns on its reserve assets and the expense of maintaining its liabilities.

By design, a currency board has no discretionary monetary powers and cannot engage in the fiduciary issue of money. It has an exchange rate policy (the exchange rate is fixed) but no monetary policy. A currency board's operations are passive and automatic. The sole function of a currency board is to exchange the domestic currency it issues for an anchor currency at a fixed rate. Consequently, the quantity of domestic currency in circulation is determined solely by market forces, namely the demand for domestic currency. Since the domestic currency issued via a currency board is a clone of its anchor currency, a currency board country is part of an anchor currency country's unified currency area.

A timeline of the major events in the evolution away from the use of a foreign currency to the issue of the Cayman dollar via a currency board that has become more orthodox over time is presented in Figure 1.

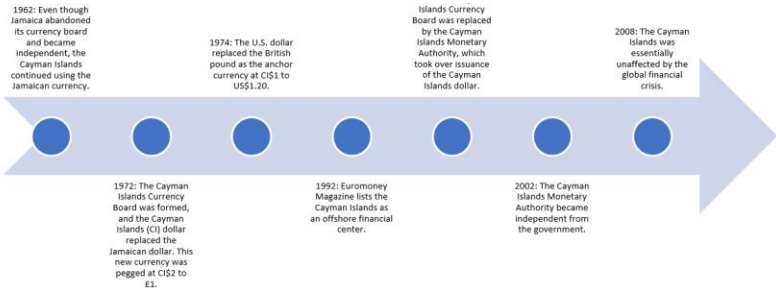

Figure 1. *Timeline of Major Currency Developments in the Cayman slands*

Before the establishment of its currency board, the Cayman Islands used the Jamaican currency, which remained the only legal tender, even after Jamaica abandoned its currency board and became independent in 1962. Concerned about the stability of the Jamaican currency, Caymanians eventually realized that it would be necessary to introduce their own separate currency.

In September 1970, the United Kingdom granted the Cayman Islands formal permission for the issue of a new, independent currency. The Currency Law of 1971, which was formally approved in October of that year, led to the formation of the Cayman Islands Currency Board. Initially, the Cayman dollar was anchored to the British pound. In a quest for more stability, the Cayman dollar's anchor was changed from the British pound to the U.S. dollar under the Currency Law of 1974. This illustrates the fact that, with a currency board, a country might have no (or little) discretionary monetary policy, but it has monetary sovereignty. It also illustrates, once again, the high priority the Cayman Islands have placed on currency stability.

Following *Euromoney Magazine's* designation of the Cayman Islands as an offshore financial center, the Monetary Authority Law of 1996 replaced the Cayman Islands Currency Board with the Cayman Islands Monetary Authority (CIMA). The Cayman Islands Monetary Authority took over the responsibilities of the Currency Board in addition to the

responsibilities of the Financial Services Supervision Department.

As the monetary authority of one of the world's most important financial centers, the CIMA devotes the majority of its staff to financial regulation. Today, its monetary functions are handled solely by its Currency Operations division (the currency board), which, as of 31 December 2017, consists of only seven staff members. On the other hand, the Authority's regulatory functions are handled by its Banking Supervision, Fiduciary Services, Insurance Supervision, Investments Supervision, and Securities Supervision divisions, which together, as of 31 December 2017, have 109 employees.[1] The Cayman Islands, therefore, illustrate an important feature of currency boards: unlike central banks, currency boards require tiny staffs. Indeed, only seven staff members man the Cayman's currency board operations.

Now, let's turn to the evolution of the currency system in the Cayman Islands. In a move towards orthodoxy, section 32 of the Monetary Authority Law of 1996 mandates that external assets should not fall below 90 percent of the demand liabilities (monetary base) of the Authority. This means that net foreign assets as a percentage of the monetary base should always be 90 percent or above, which represents a stricter limit than had existed under the currency laws of the 1970s. The following analysis indicates that the currency board operations have become more orthodox over time.

Figure 2 shows net foreign reserves as a percentage of the monetary base from 1972 through 2017. The vertical line marks the end of the Cayman Islands Currency Board and its replacement by the Cayman Islands Monetary Authority in 1997. Orthodox currency boards typically have net foreign reserves between 100 and 120 percent of their monetary base.

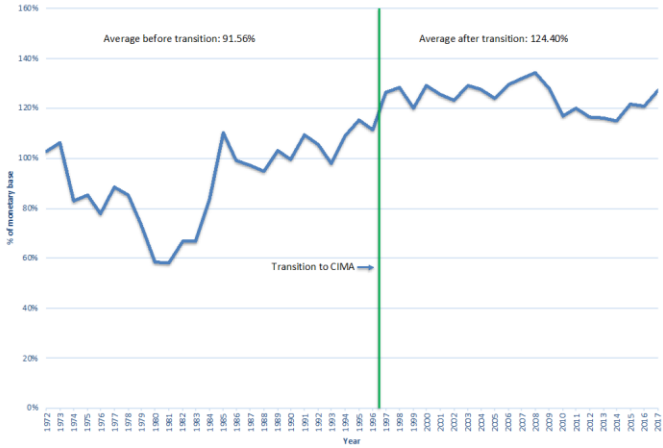

Figure 2. *Net foreign reserves as a percentage of monetary base*

During the period of operation under the Cayman Islands Currency Board from 1972 to 1996, the ratio of net foreign reserves to monetary base ranged between 58 and 115 percent and averaged 92 percent. After the transition to the Cayman Islands Monetary Authority, the ratio was much higher and tighter, ranging from 115 to 134 percent and averaging 124 percent. The Monetary Authority Law of 1996 made currency board operations much more orthodox.

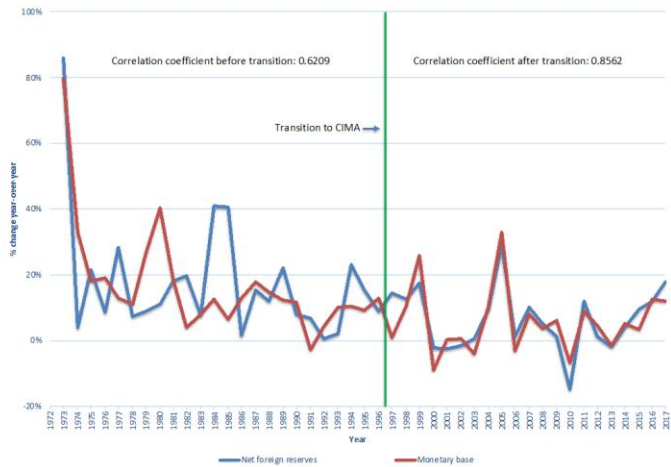

Figure 3. *Annual percentage change in net foreign reserves and monetary base*

The move to orthodoxy, with the introduction of the CIMA, is also on display in Figure 3, which compares the percentage changes in monetary base and in net foreign reserves. The correlation coefficient between the two metrics increases from 0.6209 to 0.8562 after the transition to the CIMA. This indicates much less monetary discretion.

The Cayman Islands currency story is one of stability. Indeed, the Caymans realize that, when it comes to currency, stability might not be everything, but everything is nothing without stability. After Jamaica abandoned its currency board, the Caymans rightfully anticipated that the Jamaican dollar would become a third-rate Caribbean currency. In consequence, the Caymans dumped the Jamaican dollar and replaced it with a Cayman dollar issued by a currency board in 1972. Shortly thereafter, the Caymans realized that the British pound, which was the anchor for the original Cayman dollar, was unstable. So, in 1974, the anchor was changed from the British pound to the U.S. dollar. Finally, after the Cayman Islands became recognized as an offshore financial center, today's Cayman Islands Monetary Authority took over the currency board operations in 1997. With that, the currency board operations became even more orthodox. In consequence, stability has become more deeply entrenched. This allowed the Cayman Islands to weather the global financial crisis of 2008 largely unaffected.[2]

Notes

[1] *Cayman Islands Monetary Authority Annual Report*, 2017, pp. 12-13.

[2] Anthony Travers, "An Open Letter to President Obama from the Cayman Islands Financial Services Association," May 5, 2009.

5 Issues in Venezuelan monetary and economic reform

María Belén *Wu*

Introduction

Since their independence, Latin American countries have displayed a common fervor for populist socialism. Whether it is a residue of three centuries of European imperial rule, or simply a fondness for charismatic leaders – and an extraordinary talent for producing them – the widespread formula of clientelism and cronyism disguised as socialism has proven to have devastating consequences for the continent's economic, social and political development.

Nowhere is this phenomenon displayed more clearly at present than in the Bolivarian Republic of Venezuela. The country is suffering its worst humanitarian and economic crisis in history, which calls for an urgent solution. This chapteranalyzes the historical background and current conditions relating to the crisis, focusing on its monetary and financial aspects. It aims to assist in making recommendations for appropriate monetary reforms, such as the establishment of an orthodox currency board or official dollarization. The chapter addresses critical questions concerning such reforms,

as well as complementary economic reforms that would improve Venezuela's troubled economy in the near future.

Prelude to socialism

"The Devil's Excrement"

Venezuela has the largest oil reserves in the world. From 1917 onward, oil revenues have grown significantly in relevance in the country's national accounts. Oil exports began to displace other commodity exports in a typical manifestation of what would later be called "Dutch disease," as Venezuelan oil exports produced sharp inflows of foreign currency, leading to the appreciation of the bolívar, resulting in the loss of competitiveness of traditional exports such as cash crops. Thus, increasing dependence on oil was accompanied by a gradual contraction of other sectors of the economy. By 1926, oil had displaced coffee as the country's most valuable export commodity and biggest revenue generator; by 1929, it was providing 76 percent of the country's export earnings and half of government revenues (Boué, 1993: 179).

The detrimental effects of dependence on oil on the Venezuelan economy went unnoticed for a long time. Little to nothing was done to diversify domestic industry using oil revenues until the 1950s, when import substitution economic policies only exacerbated the dominance of oil exports. Subsequently, the extra oil revenue from the 1973 oil shock was used to launch great public projects in the hopes of an industrial takeoff and a boost to output in the public sector, but state-owned enterprises constantly underperformed and instead contributed to a sizeable proportion of the increase in Venezuelan external debt (Boué, 1993: 185). Moreover, the volatility of oil income clashed with ongoing public projects, pushing government expenditure up at times of low revenues, which further piled up Venezuelan debt (Naím, 1993: 22). Despite these conspicuous economic problems, it was easy to turn a blind eye when Venezuela's income per capita was still comparable to that of Western European countries.

Former oil minister Pérez Alfonzo accurately termed oil "the devil's excrement," in accord with his grim predictions for

Venezuela under the illusion of economic development generated by oil revenue. Meanwhile, complacency continued.

Collapse of the Bolívar

Rising oil prices in the 1970s (see Figure 1) brought wild speculation in Venezuela. State agencies and private enterprises continuously contracted massive amounts of loans in an unregulated, corrupt banking system (González, 2014: 41) in the naïve belief of an everlasting boom. As oil prices eventually collapsed in the 1980s, the bubble burst and Venezuela suffered a banking crisis followed by a deep recession.

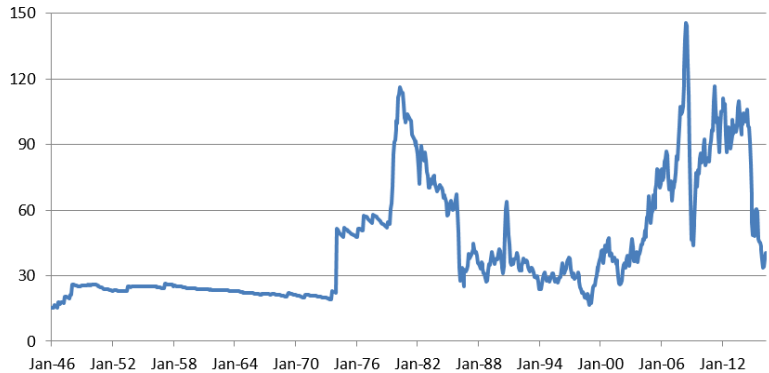

Figure 1. *WTI crude oil price (USD/Barel), 1946-2016*
Sources: Energy Information Administration, Bureau of Labor Statistics.
Note: Real datasets are adjusted for inflation using the headline Consumer Price Index (CPI) with the current month as the base.

The banking crisis brought with it a currency crisis, as the Venezuelan bolívar suffered its first major devaluation, of nearly 100 percent,[1] on the so-called Black Friday of February 18, 1983. As a response, the government of president Luis

[1] Here and subsequently I use the Latin American way of speaking about devaluations, in which the pre-devaluation exchange rate is the base of calculation, so a change from 5 bolívares to 10 bolívares per dollar is a devaluation of 100 percent. In the U.S. way of speaking, the post-devaluation exchange rate is the base of calculation, so the devaluation is 50 percent.

Herrera Campins established a currency control agency for the first time ever, the Régimen de Cambio Diferencial (RECADI). RECADI aimed to restrain the free distribution of oil wealth and instituted a complicated four-tier exchange rate system with fixed preferential rates for "essential" transactions and floating rates for other transactions. This system lasted until 1989, at which point the bolívar to dollar exchange rate had increased from 4.3 Bs. to 39.6 Bs., and accumulated annual inflation had reached 520 percent. The bolívar has never recovered to its pre-crisis levels and has suffered continuous, ever larger devaluations.

However, instead of serving as a cautionary tale against currency controls, the RECADI years seemed to have set a precedent for future Venezuelan leaders. The motivation behind this policy is the system's high profitability for the economic and political elite. From 1983 to 1989, a reported $60 billion in foreign reserves were misappropriated through the RECADI system, twice the amount of Venezuela's external debt during that period. With a budget of $28.3 billion, RECADI granted $43.5 billion in foreign exchange permits. This generated $15.2 billion of direct fraud in addition to the indirect fraud resulting from reselling the preferential dollars at higher market rates. Amazingly, no prosecution was sought after the fact. To this day, RECADI still provides one of the most spectacular examples of corruption in all of Latin America (Cordeiro, 2016: 13).

It was under these circumstances that the Bolivarian Revolution came to life; it was also under the same circumstances that the Revolution failed.

Economic decline under socialism

Hugo Chávez: Socialist for the 21st Century

Economic conditions in Venezuela worsened significantly in the 1980s and 1990s. Balance of payment deficits occurred every year between 1986 and 1989 due to the falling oil prices of the mid-1980s. They were also symptomatic of the bolívar's overvalued exchange rate under the RECADI system, and resulted in dwindling international reserves (Naím, 1993: 36).

Then came the 1994 Mexican peso crisis, which took another toll on the already weakened economy. In his attempt to apply a series of austerity measures imposed by the International Monetary Fund, Rafael Caldera, Chávez's predecessor, implemented devaluations and privatizations that disproportionately hurt the lower class. Unemployment and underemployment had increased, and almost half of the workers were employed in the informal sector. Annual inflation reached a high of 103 percent in 1996, according to the IMF *World Economic Outlook;* minimum salaries did not cover basic needs; and per capita income fell dramatically. According to the United Nations, the number of people living below acceptable living standards in the country ranged between 65 to 70 percent (González, 2014: 66).

In the meantime, the Bolivarian Revolution Movement was rising to prominence. The Movement was initially a military clandestine group within the Venezuelan army that attempted a series of unsuccessful coups d'état in 1992. The group then gradually morphed into a political organization as their leader's electoral success became more likely, Chávez being the only candidate untainted from involvement in the country's economic turmoil. On February 2, 1999, 56.2 percent of the Venezuelan population elected Hugo Chávez Frías as the new president of Venezuela.

Chávez was without doubt a charismatic leader who appealed to the lower and middle classes, deploying the Bolivarian discourse to perfection. He identified the shared enemies of the nation, namely the corrupt elitist politicians who preceded him, and more important, the United States – the imperial power that had supposedly kept Venezuela under its thumb all along.

Chávez positioned himself as the successor to Simón Bolívar, the father and liberator of the nation. Just as Bolívar had achieved freedom from the Spanish, Chávez would free Venezuela from the United States. He offered the promise of an authentic democracy, a rejection of neoliberalism, an egalitarian redistribution of oil revenues, recognition of women and minorities' rights, and a military that served the people

(González, 2014: 68). This was the start of the Bolivarian Revolution.

But the Bolivarian Revolution was not always a socialist revolution. On gaining power in 1999, Chávez signaled continuity to the international financial community by retaining Rafael Caldera's finance minister, Maritza Eizaguirre. The currency controls were also kept untouched, and there was no great change in fiscal policy regulations. Despite the strong emphasis Chávez placed on social rights and entitlements, his initial economic policies were still orthodox and somewhat rightist (Cannon, 2014: 80).

It was not until 2001 that the revolution took a left turn, when the government introduced a series of radical laws on land reform, oil policy and fishing. The reforms led the political opposition to attempt a coup in 2002 (tacitly supported by the United States), an oil strike from 2002 to 2003, and a recall referendum in 2004. The ultimate failures of these attempts to unseat Chávez in turn discredited the opposition and strengthened Chavist support.

Meanwhile, Chávez revamped social policy in 2003 with the introduction of Bolivarian Missions, a series of social welfare, social justice, anti-poverty, educational, and military recruiting programs. Worker cooperatives were also introduced into the production process, and the government began expropriating companies and handing them over to workers. In January 2005, Chávez officially announced that Venezuela would move towards a new "socialism for the twenty-first century."

Twenty-first-century socialism would be based on humanism and solidarity, and it would transcend capitalism as well as the statism of twentieth-century socialism. The crucial problem of Chávez's vision was the disproportionate amount of ideological content compared to actual programmatic content (Cannon, 2014: 81), thus allowing an enormous degree of economic mismanagement.

To begin with, the government greatly increased state control over oil revenues. While Petróleos de Venezuela (PdVSA) had been a state-owned enterprise since 1976, the firm was subject to a substantial amount of private-sector management. The oil strike in 2003 led by the Venezuelan

opposition provided the ideal pretext to replace PdVSA's upper and middle levels of management, as well as approximately 18,000 workers who had participated in the strike. In addition, the government transformed PdVSA's existing service agreements with smaller oil companies into joint ventures with majority PdVSA stakes, and ultimately transformed the joint ventures into PdVSA-controlled projects, evidently expanding government custody of oil wealth. As a result of these steps and rising oil prices in the 2000s (see Figure 1), state revenue from oil increased from $6 billion in 1999 to $25 billion by 2005. Put another way, it increased from 5.79 percent of GDP in 1998 to 15.89 percent of GDP by the end of 2006 (Cannon, 2014: 84).

The higher revenue partly went to increase international reserves from 2003-2007 (See Figure 2), but most of it was used as government expenditure, in order to fund the poverty reduction programs such as the Bolivarian Missions. The limited – and likely unreliable – government statistics show major improvements in access to food, housing, education and health. However, a study using the "synthetic control" method contends that Chávez's policies did not have a significant impact on socioeconomic development. In fact, compared to the control, per capita income fell dramatically in Venezuela. The study also found that while poverty, health and inequality outcomes all improved during the Chávez administration, these outcomes also improved in each of the corresponding control cases, thus the improvements cannot be attributed to Chavismo (Grier & Maynard, 2015: 1). These findings cast serious doubt on the effectiveness of the expensive social policies of the Bolivarian Revolution (see Figure 3), policies that led to the government printing ever-larger sums of money, resulting in the continuous devaluation of the bolívar.

Figure 2. *Foreign Exchange Reserves (USD Millions), 1999-2016*
Source: Banco Central de Venezuela.

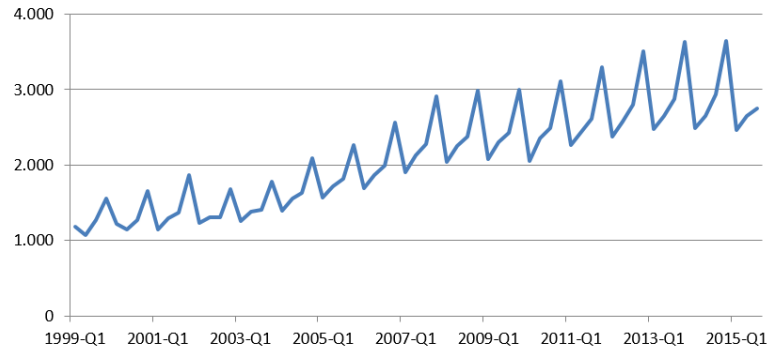

Figure 3. *Venezuelan Government Expenditure (Bs. Millions, Real 1997 Bs.), 1999-2015*
Source: Haver Analytics, Banco Central de Venezuela.

Indeed, the monetary policies that accompanied social programs had the most devastating effect on the Venezuelan economy. In 2003, Chávez installed price controls for essential consumer products, which increased supply shortages from an average of 5 percent to 22.2 percent in 2013, the last record published by the central bank. Currently, in 2016, the shortage of products in the basic household consumption basket has quadrupled and stands at 41.3 percent, according to the nongovernmental Center of Social Analysis and Documentation of the Venezuelan Federation of Teachers. Price controls aggravated the situation for the domestic agricultural and manufacturing sectors, which were already

weakened by Dutch disease in the early oil boom years. As a result, food imports rose dramatically in order to reduce shortages.

In addition to this, a new currency control agency was also introduced in 2003, the Comisión de Administración de Divisas (CADIVI). The new exchange rate was set to 1,600 Bs. per dollar. This rate was introduced after the political instability of the early 2000s as a measure to reduce capital flight by placing currency limits on individuals. However, its immediate consequence was the emergence of a currency black market, fuelled in part by the reliance on imports that required payments in foreign currency. (See Figure 4, which is in terms of the bolívar fuerte introduced in 2008, equal to 1,000 old bolívares.)

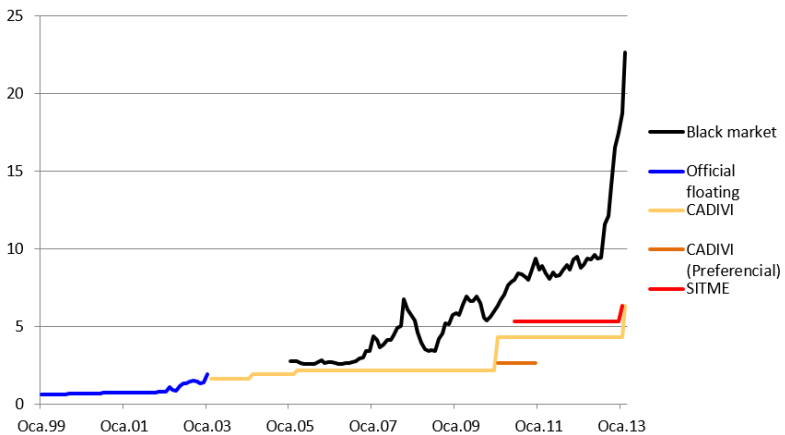

Figure 4. *USD/VEF Exchange Rates, 1999-2013*
Sources: Banco Central de Venezuela, DolarToday, Monedas de Venezuela, Inmuebles Caracas, datastorytellinggroup.org/venezuela.

A vicious circle was created, whereby currency controls pushed up import prices to black market rates, which were in turn reflected in higher consumer prices. Nevertheless, due to the price controls in place, many firms were forced to sell their products below the cost of production, resulting in insufficient revenues to continue production. Ultimately, the policies that were meant to help reduce poverty backfired by aggravating

supply shortages, producing record levels of inflation, and generating massive levels of debt.

Figures 5 and 6 below show that the public external debt accumulated during the Chávez administration (1999-2013) was roughly equal to 30 percent of Venezuela's total debt and 75 percent of the external debt alone.

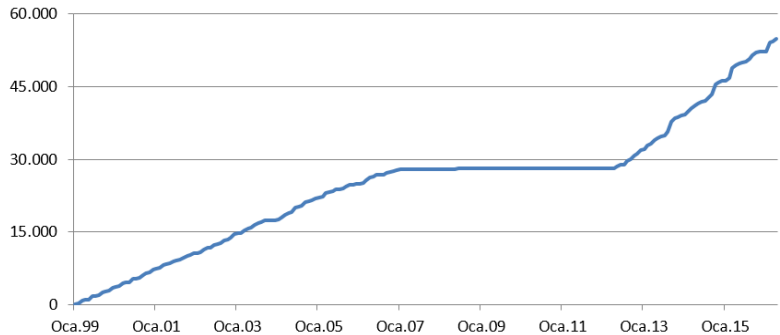

Figure 5. *Net Accumulated Public External Debt (USD Millions), 1999-2016*
Source: Banco Central de Venezuela.

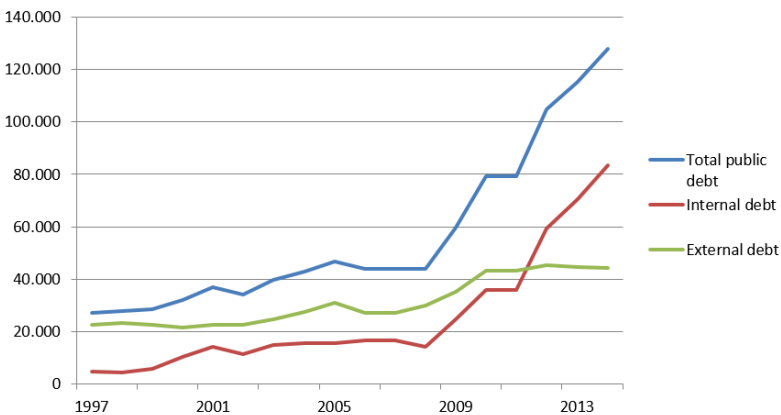

Figure 6. *Venezuela Total Public Debt (USD Millions), 1997-2014*
Source: United Nations Economic Commission for Latin America and the Caribbean.
Note: Data missing from 2015 onwards.

Figures 7 and 8 below show the exponential increase in Venezuela's monetary base as well as in official CPI inflation, generated via money printing. The devaluation of bolívar occurred with such speed and momentum that in January 2008 the government decided to create a new currency, the bolívar fuerte, by eliminating three zeros from the old currency. Clearly, this did not eliminate the core problem. According to Hanke & Krus' (2013) "Inflation by the Decades: 2000s" report, Venezuela stood at number 7 in the world inflation ranking for 2000-2009, with a cumulative inflation rate of 567.7 percent, and this period was only the beginning of the crisis.

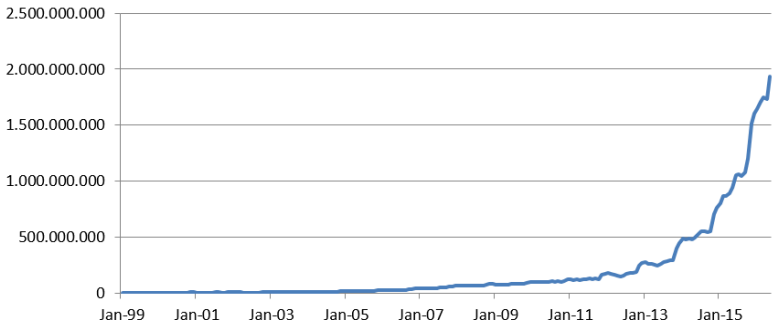

Figure 7. *Monetary Base (Bs.), 1999-2016*
Source: Banco Central de Venezuela.

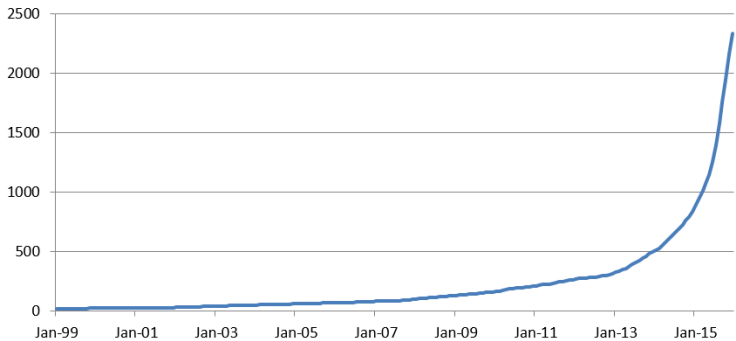

Figure 8. *Venezuela CPI Index (Dec 2007=100), 1999-2016*
Source: Banco Central de Venezuela.
Note: Data missing from Jan-2016 onwards from BCV.

Nicolás Maduro and the Failure of the Bolivarian Revolution

Chávez was re-elected in 2013 but was unable to take office due to severe illness. He named his vice president, Nicolás Maduro, as his successor and new leader of the Bolivarian Revolution. Chávez died on March 5, 2013,[2] and Maduro was elected president on April 14, 2013.

Maduro inherited a Venezuela in deep crisis, and yet he hardly changed any of the policies from his predecessor's flawed ideology. What Maduro did do was create an over-complicated myriad of exchange rate systems, all of which failed to reflect the market value of the bolívar and exacerbated its depreciation. Moreover, one of the primary purposes of employing exchange rate controls is to prevent capital flight. However, the level of Venezuelan foreign reserves had remained relatively stable until 2015 (see Figure 2), which casts doubt on both Chávez and Maduro's motives for implementing an exchange rate control and further suggests private interest in the misappropriation of Venezuelan money.

The Sistema Complementario de Administración de Divisas (SICAD), a foreign currency auction system with the aim of activating legal currency trade between Venezuelan citizens and attempting to reduce black market trade, was created in March 2013. SICAD II was then added in February 2014; it extended the system to Venezuelan nationals at a higher rate. At the same time, the CADIVI currency control agency became part of the Centro Nacional de Comercio Exterior (CENCOEX), creating a multi-tier exchange rate system. When these measures failed to curb black market currency trade, the government added the Sistema Marginal de Divisas (SIMADI) in 2015, where the price of the dollar was supposed to be determined by market supply and demand. However, SIMADI operated as a pegged exchange rate system. In 2016, all previous systems were replaced by a new dual exchange rate, offering a preferential and a floating rate, the Protegido (DIPRO) and the Complementario (DICOM), similar to Campins' RECADI and

[2] There are suspicions that he died earlier but that his death was not revealed for some weeks.

Chávez's CADIVI systems. As Figure 9 shows, the disparity between the black market and the most important official rate reached an all-time high of 82 percent in March 2016.

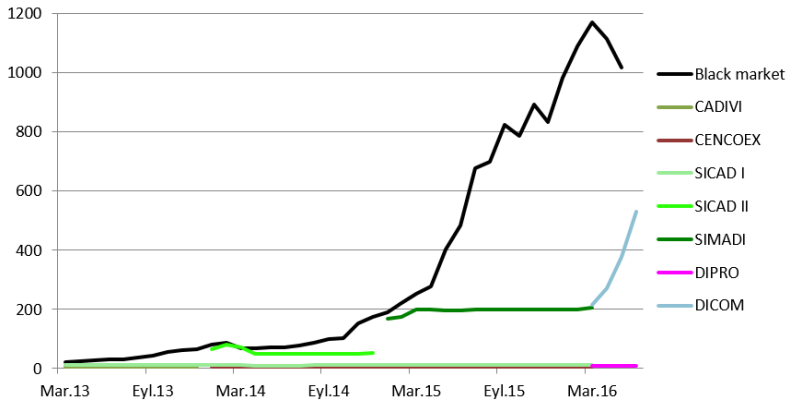

Figure 9. *USD/VEF Exchange Rates, 2013-2016*
Sources: Banco Central de Venezuela, DolarToday, SimadiToday, Monedas de Venezuela, Inmuebles Caracas, datastorytellinggroup.org/venezuela.

History repeated itself when oil prices collapsed again in mid-2014 and dropped to a low of $33.79 in January 2016 (see Figure 1). The story popularized in the media that the drop in oil prices triggered Venezuela's economic and humanitarian crisis is highly misleading. The warning signs had been there all along, and the government had chosen to ignore them. Even when oil prices were hovering around $100 per barrel in 2013, inflation was skyrocketing, chronic shortages of goods were common, external debt was soaring, and Venezuelan GDP had already begun to decline in real bolívares, not to mention its dismal dollar value (See Figure 10). The fall in oil prices only exacerbated the situation, in addition to harsh environmental conditions like droughts caused by El Niño phenomenon, which resulted in electricity and water supply shortages.

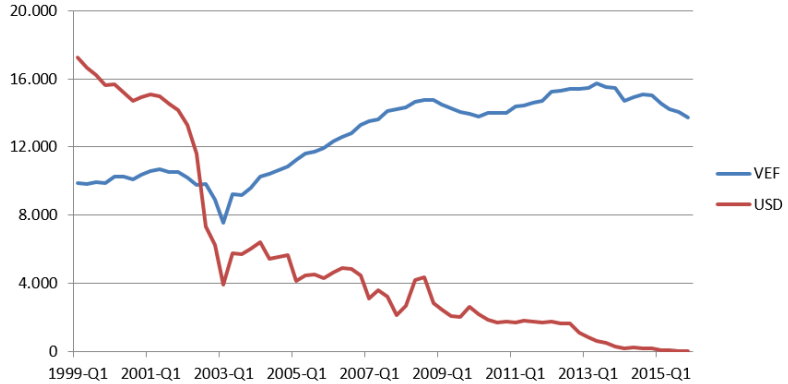

Figure 10. *Venezuela Real GDP (Millions), 1999-2016*
Sources: Haver Analytics, Banco Central de Venezuela.
Note: VEF values in real 1997 bolívares, USD values calculated using floating and black market rates.

At present, most foreign investors have fled the market as the value of the bolívar continues to drop and dollars have become harder to obtain. Multinational corporate giants such as Kimberly-Clark, Procter & Gamble, Johnson & Johnson, and Mondelez have opted to remove Venezuela from their global operations to avoid a direct impact on the overall company's bottom line, further intensifying shortages. Coca-Cola has stopped production due to the lack of cane sugar, and McDonald's has halted production of Big Macs due to a bread shortage. While the stock market shows high nominal growth in recent years (see Figure 11), there has been a spectacular fall in the dollar value of stocks from their peak (see Figure 12). Even so, some investors continue to use the stock market as a vehicle to hedge against the rapid currency devaluation, since the prevailing thinking is that it is better to hold stocks than bolívares.

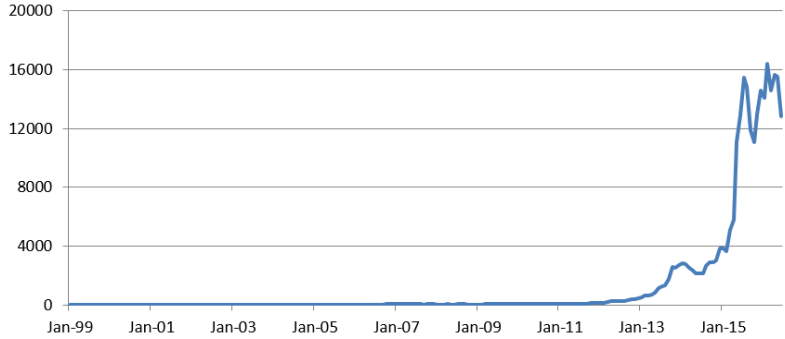

Figure 11. *IBVC Index Historical Prices (Bs.), 1999-2016*
Source: Bloomberg Finance L.P.

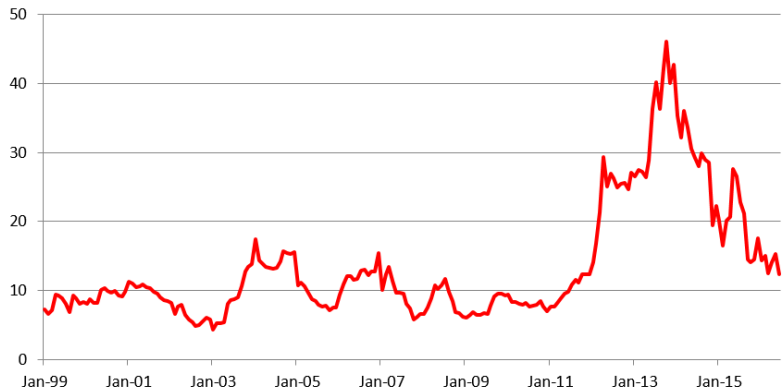

Figure 12. *IBVC Index in US Dollars at Market Rates, 1999-2016*

The same applies to Venezuelan bank deposits, which have skyrocketed in nominal terms, but have however plummeted in US dollar terms, reflecting the loss of value of the bolívar (see Figure 13 and 14).

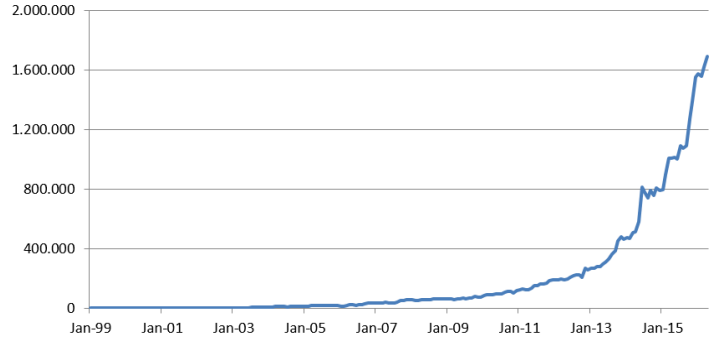

Figure 13. *Bank Deposits in National Currency (Bs. Millions), 1999-2016*
Source: Banco Central de Venezuela.

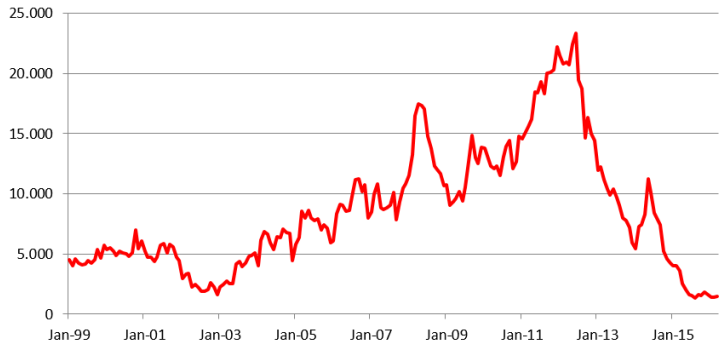

Figure 14. *Bank Deposits in US Dollars at Market Rates (Millions), 1999-2016*

The loss of value can also be illustrated by the stark contrast between the real inflation rate experienced over the last three years and the banks' deposit rates. Figure 15 below shows monthly year-on-year implied inflation calculations based on purchasing power parity of the bolívar versus the dollar, in comparison to official inflation. At its peak in July 2015, inflation reached 809.1 percent, and it remains the highest inflation rate in the world. Meanwhile, Figure 16 shows Venezuela's monthly bank deposit rates, which have remained mostly unchanged from 2010 onwards, at approximately 15 percent. This once again emphasizes the dramatic fall in value of bank deposits and the decapitalization of Venezuelan wealth, as inflation eats away at people's savings.

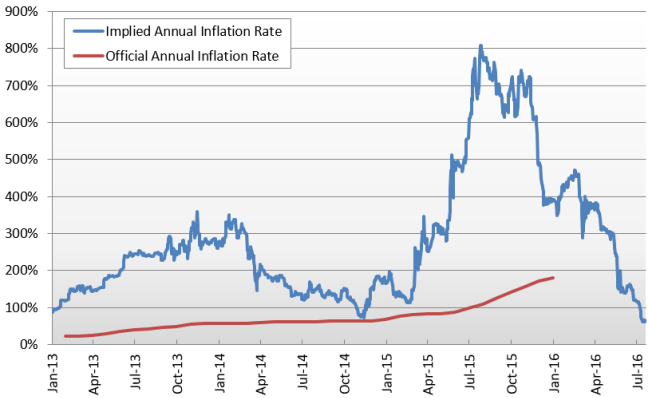

Figure 15. *Venezuela's Annual Inflation Rates*
Sources: Banco Central de Venezuela, DolarToday, Dollar.nu, Dolar Paralelo, International Monetary Fund (IFS), Paralelo Venezuela, and calculations by Prof. Steve H. Hanke, The Johns Hopkins University.
Note: These annual inflation rates are implied from the the black-market VEF/USD exchange rate.

Figure 16. *Venezuela Deposit Rates (% per Year), 1999-2016*
Source: Banco Central de Venezuela.

Not only does Venezuela have the highest inflation rate in the world, but it also holds the record for the highest crime rate. Food riots, protests and mass lootings of stores are increasingly common. "Bachaquerismo," [3] the resale of price-controlled goods at black-market prices – arbitrage at its finest – has become a profession. About 72 percent of monthly wages are

[3] The word comes from the *bachaco,* a Venezuelan ant species. It implies that arbitrageurs are like ants, whose movement of grains of food from one place to another is individually tiny but collectively significant.

being spent just to buy food, according to the Center of Social Analysis and Documentation of the Venezuelan Federation of Teachers. In April, it found that a family would need the equivalent of 16 minimum-wage salaries to properly feed itself. Besides, a public health crisis has erupted from the lack of medical supplies, water and electricity. According to a government report, the rate of death for newborns increased more than a hundredfold in public hospitals run by the Health Ministry, from 0.02 percent in 2012 to just over 2 percent in 2015; the rate of death among new mothers in those hospitals increased by almost five times in the same period.

On January 14, 2016, Maduro declared a state of emergency for 60 days that has since been extended three times. He accused the business elite of boycotting the economy, as well as the United States of plotting a coup against Venezuela. The decree has given the military and local committee powers to distribute and sell food, and also allows the government to take control of basic goods and services. Consequently, in the midst of Venezuela's biggest humanitarian crisis, the government is now implementing a food rationing system whereby loyalists are given food and opponents are deprived of access. Though 63.6 percent of Venezuelans say Maduro should quit this year or be removed via a recall referendum, Maduro was able to block the referendum by manipulating the National Electoral Council into declaring 600,000 of the votes invalid. On September 1, 2016, the political opposition successfully organized a large-scale anti-Maduro march in Caracas, which brought together close to a million people from all social classes and backgrounds. The rally ignited hopes that the electoral authorities will be pressured into allowing the launch of a second petition needed to trigger the recall referendum before the end of the year.

Whether or not Maduro remains in power, the crisis requires a solution now. The clientelistic state model and socialist policies that relied heavily on oil revenues, as well as the anti-neoliberal manifestations of import substitution, currency controls and price controls have failed altogether. The Bolivarian Revolution has failed.

A key to economic growth: Monetary reform

Mundell's "Impossible Trinity"

The "Impossible Trinity" is a trilemma in international economics often attributed to Nobel laureate Robert Mundell, though it had also been identified by some earlier writers. It states that it is impossible to simultaneously achieve the three monetary policy objectives of a) a fixed exchange rate, b) international capital mobility, and c) monetary autonomy. Instead, the monetary authority can pursue fully at most two of the three policies at the same time.

Venezuela, like most Latin American countries before 1990, had a pegged but adjustable exchange rate regime. While the regime was usually associated with exchange rate stability and an open capital account to attract foreign investment, Venezuela's currency controls prohibited the open flow of international capital, and after Black Friday in 1983, exchange rate stability became a relic. Therefore, all that is left for Venezuela is its monetary policy autonomy. But what good is monetary policy autonomy in an environment of rampant corruption, poor economic management and government intervention?

The experience of a number of former socialist countries suggests that a key to Venezuela's reform lies in forsaking monetary policy autonomy and in turn gaining a stable, fixed exchange rate and international capital mobility. The first step is to dispose of the current monetary authority, the Banco Central de Venezuela (BCV). In this paper, we discuss two alternative monetary systems that will potentially improve Venezuela's economy both in the short run and the long run.

Central Banks vs. Currency Boards

Central banking is the most widely used monetary system in the world, whereby a central bank constitutes the ultimate authority with the power to enact discretionary monetary policy via a range of policy tools to try to reach certain economic targets. Central banking spread across Europe in the nineteenth century with the expansion of the international gold standard, and was eventually embraced by most

peripheral countries in Asia, Africa and Latin America and the Caribbean in order to join the process of international financial integration.

Thus, alternative monetary regimes, including the currency board system, are not of common knowledge and misconceptions about them are frequent. A currency board is a monetary institution whose only mandate is to control the supply of banknotes and coins (and, if they exist, reserve deposits) in an economy.

Unlike a central bank, an orthodox currency board is a strictly rule-bound institution, making it an ideal system for countries where the rule of law is weak and there is a tendency of political corruption. First, a currency board must have a 100 percent backing of the monetary base in foreign reserves, usually in the form of government issued securities with a ceiling of 110 percent, and must be fully convertible into the reserve currency on demand. Second, a currency board maintains a permanently fixed exchange rate with the reserve currency, for which it in turn sacrifices monetary policy autonomy, as described in Mundell's trinity. Third, a currency board cannot serve as a "lender of last resort" to the government – imposing desperately needed fiscal discipline – nor does it regulate reserve requirements for commercial banks.

Several currency boards and currency board-like systems have been implemented in the past. Some of the most notable recent examples are Hong Kong, Estonia, Lithuania, Bulgaria, and Argentina. This last one merits some attention when discussing the establishment of a currency board in Venezuela, as an example of the failure of an unorthodox currency board.

After experiencing years of high inflation, Argentina sanctioned the Convertibility Law in 1991 in order to establish the so-called "convertibility system," adopting a fixed exchange rate of 1 Argentine peso per US dollar. The system deviated from an orthodox currency board in essential ways that were stipulated in the Convertibility Law. Most notably, the law only required the central bank's monetary liabilities to be covered by a minimum of 100 percent in gross dollar-denominated assets (Hanke & Schuler, 1999: 406). When reserves exceed the

minimum requirement, monetary authorities have the freedom to engage in currency sterilization via open market operations. While most unorthodox currency boards are similarly lax about sterilization, the Argentine case stands out for its monetary policy hyperactivity. The central bank's balance sheets reflected frequent and significant currency sterilization measures, which resulted in extremely high volatility of the central bank's net domestic asset position (Hanke, 2002: 211). In addition, the Convertibility Law allowed the central bank to continue financing government deficits, regulating the banking sector, and acting as a lender of last resort, all of which undermined confidence and credibility in the system's functionality and contributed to its dismantling in 2001.

The critical lessons for Venezuela from the Argentine experience are the dangers of regulatory loopholes. This issue is even more relevant in Venezuela, where the central bank and other monetary institutions such as the currency control boards are regularly subject to unsound government intervention. In fact, in 1995-6 there was a major debate about installing a currency board system, when Prof. Steve Hanke was appointed as Rafael Caldera's adviser. However, Caldera, under great pressure from the BCV and Venezuela's political elite, chose not to adopt the currency board system. The main pushback from the politicians was that they were unwilling to be shackled by the discipline resulting from a currency board system. It becomes clear that in order to guarantee the optimal performance of a currency board, the BCV must cease to exist in its present form and new laws should be drafted for the establishment of an orthodox currency board and clearly prohibit any form of political interference in its operations.

Establishing an orthodox currency board in Venezuela

To undertake monetary reform in Venezuela through a currency board, the first stage of the process would be to convert the existing central bank into a currency board. First, all functions of the central bank other than supplying the monetary base should be delegated to other administrative

bodies. In the case of Venezuela, this can be the Ministerio del Poder Popular para la Banca y Finanzas. Commercial banks could operate the payments system and provide mutual deposit insurance protection (Hanke & Schuler, 2015: 46).

Second, there should be a brief period of free-floating exchange rates for the domestic currency, which will indicate an appropriate exchange rate between the reserve currency and the domestic currency that can later become fixed (Hanke & Schuler, 2015: 46). For instance, in the case of Bulgaria in 1997, after the announcement of the implementation of a currency board, the monetary base was frozen and the lev was floated for 30 days. After this period, the lev was fixed at the resulting rate against the German mark. However, considering the current state of crisis in Venezuela, this step could be omitted for a faster transition, as the black market exchange rates already provide a good indicator for a future fixed exchange rate under the currency board; more precisely, the average rate achieved in the last 90 days would under current conditions be suitable.

At the same time, the government should announce its choice of reserve currency and the date it will fix the exchange rate. This would prevent excessive currency depreciation due to uncertainty, and the announcement of a currency board system itself would probably push the black market rate down by a significant amount, as was the case of Indonesia, where the rupiah soared by 28 percent against the dollar in February 1998 with the announcement of a currency board (Hanke, 2007). Still, official inflation will inevitably rise, presumably to the levels indicated by the implied inflation rate (see Figure 15). This figure would then decrease drastically as the currency board was established and began its operations, allowing inflation rate to converge towards the anchor country's rate.

The choice of reserve currency for Venezuela is obvious. Being a petro-economy, most of Venezuela's foreign currency transactions are made in U.S. dollars. Realistically, shock asymmetry with the United States should not be a priority concern in Venezuela's decision-making, simply because Venezuela bears no shock symmetries with any stable advanced economy. Even so, the dollar would represent a

better choice than the euro or the yen since the United States is Venezuela's largest trading partner.

An additional step in Venezuela's case would entail the replacement of all BCV personnel as a sign of full commitment to the new monetary system. Ideally, this would take place swiftly if the administration were to fall into the hands of the opposition, which would also result in the substitution of most current government officials. Additional actions to increase the central bank's transparency could involve publishing weekly or even daily statistics and balance sheets, or requiring the BCV to fully back any further increases in the monetary base with foreign reserves (Hanke & Schuler, 2015: 46).

The next step would be to convert some of the required reserves of commercial banks into currency board notes and coins or into foreign securities at the banks' disposition. This step would eliminate the deposit liabilities of the central bank (Hanke & Schuler, 2015: 46). In addition, the BCV keeps excess reserves from universal and commercial banks, investment banks, savings and loan institutions, mortgage banks, and financial leasing companies (see Figure 17). To prevent extra inflation, these could be converted into government bonds instead of currency board notes and coins. Despite being deep in crisis, Venezuela has kept a surprisingly disciplined commitment in meeting its billions of dollars worth of international debt obligations. This good record of repayment has contributed to an unexpected rally in Venezuelan bonds, especially since the recent rebound in oil prices. Prices for benchmark debt due in 2027 increased from a record low of 33 cents in the dollar in February to 46 cents in June. While the decision to prioritize foreign lenders as the population starves is highly controversial, it will contribute to faster economic rebound if there is a debt restructuring.

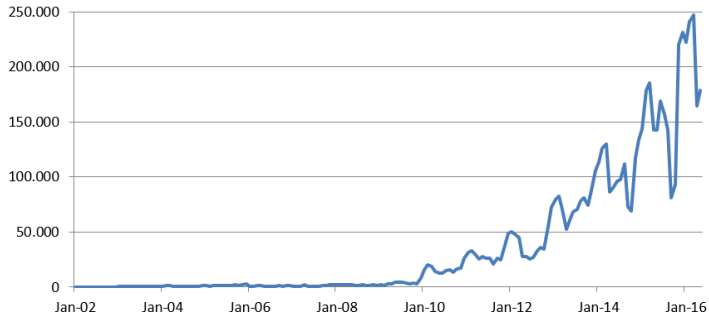

Figure 17. *BCV Monthly Average Excess Reserves (Bs. Millions), 2002-2016*
Source: Banco Central de Venezuela.

The next step in establishing the currency board would be to fix the exchange rate with the reserve currency, by which point the government must have ensured that foreign reserves for currency board notes and coins in circulation equal 100 percent. Fortunately, as Figures 18 and 19 show, Venezuela already meets this requirement, and is above the 110 percent ceiling at both the highest official exchange rate (DICOM) and the black market exchange rate. The ratio would probably decrease in the case that the bolívar gained back some value after the currency board announcement. However, as the black market ratio currently exceeds 800 percent, this might indicate that a lower exchange rate than the black market rate is suitable to adopt as the currency board fixed rate.

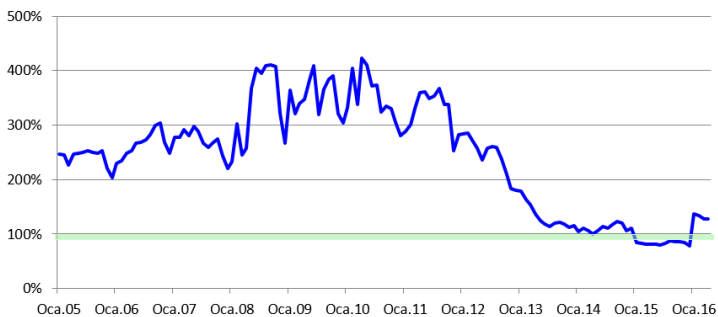

Figure 18. *USD Reserves to Monetary Base Ratio (%, Official Rates)*
Source: Banco Central de Venezuela, calculations by author.

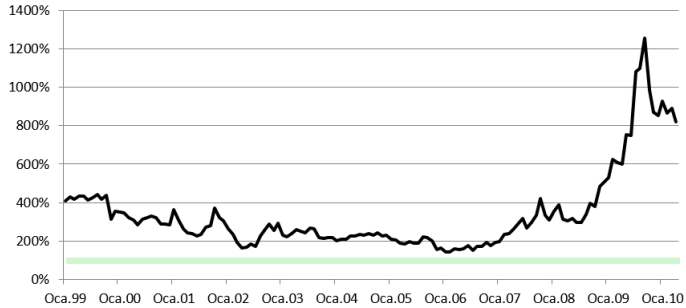

Figure 19. *USD Reserves to Monetary Base Ratio (%, Black Market Rates)*
Source: Banco Central de Venezuela, calculations by author.

The final step in the process would be to transfer the remaining assets and liabilities of the central bank to the currency board and open the currency board for business. By then, the currency board would have replaced the BCV as the issuer of domestic notes and coins, and would assume all remaining assets and liabilities of the central bank (Hanke & Schuler, 2015:48). Experience indicates that a currency board system could be established in as little as 30 days; the faster, the better.

Bolívar vs. Dollar

Some believe that the bolívar is already too far gone to be rescued. Venezuelan economist and author José Luis Cordeiro ([1998] 2016) even proclaims a "second death of Bolívar" in his book advocating dollarization, or as he calls it, the democratization of money.

There are several reasons why dollarization is a more adequate option than a currency board system in Venezuela. To begin with, there are fewer steps, less bureaucracy and very small costs involved in dollarizing an economy. Ecuador's dollarization cost around $800 million, a tiny fraction of the billions of dollars that have been smuggled through Venezuela's fraudulent exchange rate systems (Cordeiro, 2016: xvii). Additionally, the credibility of the currency would no longer be an issue, which would greatly reduce the country risk premium and interest rates, as currency risk would be

completely eliminated. Furthermore, dollarization would serve the interest of the Venezuelan people by privatizing foreign reserves and distributing them to the population, so that consumers would finally be able to fully take advantage of the perceived superiority of the dollar (Hanke, 1999: 407-8). Lastly, dollarization provides the same monetary austerity measures as a currency board, by preventing lender of last resort activities, irresponsible money printing and high inflation.

Venezuela has already begun considering dollarization as a way to salvage the economy. The government has taken steps in the auto industry, where it has recently reached a deal with Fiat Chrysler Automobiles NV, General Motors Co. and Toyota Motor Corp. by allowing them to sell output in dollars. Auto parts will also be paid for in dollars and assembly will take place in Venezuela. Production lines should resume in August.

The auto industry aside, the reality is that the entire nation is informally dollarized through the black market. No Venezuelan would prefer holding bolívares over dollars. However, the popular saying "wages climb up the stairs while prices go up in the elevator" describes the frustrations of earning a living in bolívares and spending in dollar prices (Cordeiro, 2016: 18).

Dollarization in Venezuela and lessons from Ecuador

Normally, dollarization can take one of two paths: unilateral dollarization, which can occur without a treaty; or a limited treaty with the U.S. government under which Venezuela could retain some of the seignorage it would otherwise lose from dollarization. The latter would allow Venezuelan banks to gain access to the Federal Reserve System as a source of liquidity (Hanke & Schuler, 1999: 412-3). In the interest of reforms taking effect rapidly, Venezuela would be better off choosing unilateral dollarization and forgoing seignorage. Furthermore, the absence of the U.S. Federal Reserve as a lender of last resort is in line with the objective of monetary discipline.

As soon as the government announces its decision to dollarize, the BCV can stop issuing bolívares at any time, and

simply call in all bolivar-denominated liabilities and give out the equivalent value in dollars (Hanke, 2003). The ratio of domestic currency liabilities to foreign reserves indicated on the BCV's April balance sheet suggests an appropriate exchange rate would be as low as 9.55 bolívares per dollar for these transactions (see accompanying spreadsheets), although other considerations, discussed below, suggest a more depreciated rate.

To discourage future governments from reintroducing the bolívar or any other domestic currency, the bolívar should be abolished as legal tender and the BCV's power to issue currency should be repealed. These are essential measures in Venezuela's case, given the remarkable history of economic and political manipulation.

More important, if Venezuela truly wishes for successful dollarization, it should look to Ecuador's experience. Ecuador is similar to Venezuela in many aspects; it is also a Latin American oil exporter, and adopted the Chavismo ideology under the leadership of Rafael Correa. Before dollarization, Ecuador's now extinct currency, the sucre, was subject to rapid depreciation just like the bolívar. The sucre traded at 6,825 per dollar at the end of 1998, and by the end of 1999 the sucre-dollar rate was 20,243. During the first week of January 2000, the sucre rate soared to 28,000 per dollar (Hanke, 2015: 4). Dollarization on January 9 at 25,000 sucres per dollar created immediate stability and a large positive confidence shock in Ecuador. As a simple comparison, Figure 20 shows the comparison between Ecuador and Venezuela's real GDP, converted into dollars, shortly before and since Ecuador's dollarization. The difference is staggering.

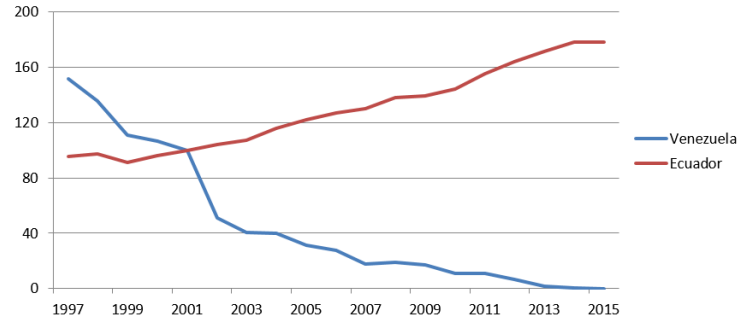

Figure 20. *Ecuador vs. Venezuela Normalized Real GDP Index (100 = 2001), 1997-2015*
Sources: DolarToday, Economist Intelligence Unit, InmueblesenCaracas.com.ve, and World Bank.
Calculations by Prof. Steve H. Hanke, The Johns Hopkins University.

In addition, Ecuador's inflation rate declined from a high of 96.09 percent in 2000 to an all-time low of 2.41 percent in 2005, and has been steady at single-digit figures ever since (see Figure 21). A similar rapid drop in inflation over a span of no more than five years could be achieved in Venezuela, if dollarization is implemented.

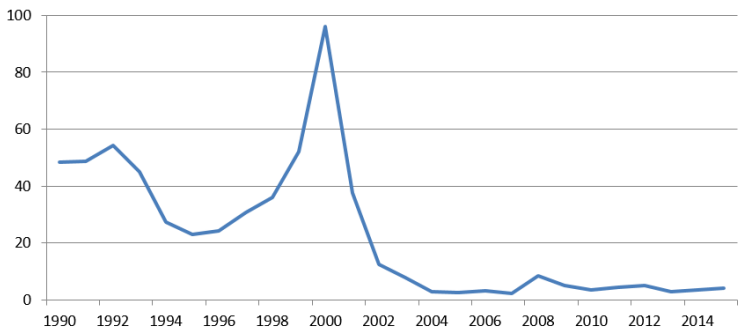

Figure 21. *Ecuador Inflation, Consumer Prices (Annual %), 1990-2015*
Source: International Monetary Fund, International Financial Statistics.

In addition, it is important to note that Ecuador deliberately chose an overvalued exchange rate of 25,000 per dollar, whereas 20,000 would have been feasible and possibly even 15,000. Other things equal, a rate of 20,000 per dollar would have resulted in a price level expressed in sucres that was only

80 percent of the actual price level once adjustment through inflation had occurred. Therefore, if we judge the price level in sucres to have caught up once inflation dropped to within 3 percentage points of the U.S. level, the total rise in prices between the announcement of dollarization and the price level catching up to the devaluation was 5 years, with inflation of 96, 38, 12, 8, and 3 percent respectively. The price level at the end of that period would be 1.96*1.38*1.12*1.03 = 3.12 times the pre-dollarization level. A crude estimate of the effect of an exchange rate of 20,000 is that inflation would have been only 80 percent (0.8) as much, giving inflation of approximately 77, 30, 10, and 6 percent, meaning that approximate inflation convergence with the U.S. would have occurred a year earlier, and the price level at the end of the period would have been only 2.68 times the pre-dollarization level.

Therefore, Venezuela should set its dollarization rate based on free market exchange rates, instead of choosing an overvalued rate in order to avoid an inflationary burst. Essentially, it is easier to adjust to a one-shot burst of inflation than to endure the depression that can occur if the exchange rate is too appreciated and have to rely on falling prices to equalize local purchasing power with purchasing power in the rest of the world.

Another issue is the adjustment of interest rates when converting from the high-inflation bolívar to the low-inflation dollar. Keeping interest rates the same in nominal terms would bankrupt borrowers, since they expect to pay back in depreciating bolívares and not stable dollars. What is needed is an interest rate conversion, or *desagio* as it has been called in some Latin American cases. In the case of Ecuador, the Ley del Desagio sanctioned in 2000 adjusted interest rates using the following formula:

$$NR = [CC * (1 + CR)] * 100$$

Where:

NR = New rate

CC = Conversion coefficient (0.659 for lending rates and 0.743 for deposit rates)

CR = Contract rate

Based on this, the lending rate was initially set at 16.82 percent and the deposit rate at 9.35 percent. A similar approach to desagio could be implemented in Venezuela, where a reference rate is picked and all other rates are adjusted in relation to it. For example, suppose that there is fairly free-market rate of 300 percent a year for certain loans in bolívares. Suppose the comparable rate in dollars for borrowers of the same quality (in the US or in a Latin American country that allows loans in dollars) is 5 percent. Then the interest rate conversion would be to divide all bolívar rates by 60, so 300/60 = 5. Other loans of 400 percent and 500 percent would become 400/60 and 500/60 in dollars. Alternatively, there could be another system such that a base rate is chosen and bolívar loans of certain classes are assessed as having an additional risk factor of X percent depending on the class, which is tacked onto the base rate. The details should not make a big difference overall, because the maturity of most loans is probably short and they will reset in dollars after dollarization. However, to avoid bankruptcies because of the details of the conversion, there should probably be some ceiling to the conversion interest rate, whereas new loans in dollars should face no interest rate ceiling. This is outlined in Art. 7 of Ecuador's Ley del Desagio, which states that existing loans at the time of dollarization could preserve the original contract rate, so long as it did not exceed the stipulated new lending rate, and the negotiated capital would be converted to dollars after a certain date at the predetermined sucre-to-dollar fixed rate.

Ecuador's state of affairs since dollarization has been far from perfect. Even though the rule of law has been embraced in the monetary sphere, it has been ignored elsewhere. The Banco Central del Ecuador continues to exist as an institution without a clear rationale, and the government has failed to make the most out of dollarization due to the lack of financial integration and reforms, continuing to overregulate the banking system. Not surprisingly, the 2014 Index of Economic Freedom categorized Ecuador as "mostly unfree," ranking 159 out of 178 countries (Hanke, 2015: 9). Therefore, Venezuela must learn from Ecuador's mistakes and accompany its monetary reform with the necessary economic reforms.

Economic reforms to complement monetary reform

Lifting Controls

Lifting currency controls is an essential precondition for establishing a currency board system, while with dollarization it ceases to be an issue at all. In contrast, lifting price controls is not a technical prerequisite for the enactment of either monetary reform. However, failure to do so would inevitably compromise the entire reform effort.

Under the Chavist economic policies, price controls have been a major source of the current inflationary and supply shortage problems. Controlled-price – or as the government calls them, "fair price" – goods are supplied by the state-run supermarket chain, Mercados de Alimentos C.A., commonly known as Mercal. This system was introduced as part of the 2003 anti-poverty Bolivarian Mission, Misión Mercal. Mercal's astonishingly low controlled prices have hardly been adjusted ever since to account for inflation. In 2013, the Superintendencia de Precios Justos was created with the passage of the Ley Orgánica de Precios Justos, with the purpose of standardizing and adjusting controlled prices throughout the country. Even with the slightly higher adjusted prices, a total of 12 billion bolívares were destined to food subsidies in 2013, 40 percent more than two years ago.

To this day, around 17 products are still selling at controlled prices that are 62 percent below market prices, and have not been revised since 2009. Such a high level of subsidy is clearly unsustainable and contributes to the vicious circle of extravagant government expenditure, inflation and shortages. Therefore, lifting price controls should be prioritized and implemented alongside monetary reforms.

Below is a list of Venezuela's original standardized controlled prices for basic food products after the ratification of the Ley Orgánica de Precios Justos, in comparison to estimates of black market (free market) prices of the same goods. Some of these prices have been adjusted since in order to reflect growing inflation. For additional prices, see the accompanying spreadsheets.

Table 1. *Original PVJusto (Fair Prices) List, January-June 2014*

Product	Bolívar (Bs.)	Black market price estimates (Bs.)
Sugar (1kg)	12.00	12,210.48
Coffee (1kg)	46.60	47,417.36
Chicken (1kg)	43.00	43,754.22
Rice (1kg)	9.50	9,666.63
Bottled water (1l)	12.59	12,810.83
Fruit jam (110g)	9.96	10,134.70
Milk (900ml)	18.00	18,315.72
Powdered milk (1kg)	70.00	71,227.80

Source: Superintendencia de Precios Justos.

Another clear demonstration of the failure of price controls to achieve their purpose can be seen in the price comparison of Venezuelan staple goods and services before and after the implementation of Chavist economic policies. The table below provides a clear contrast between the cost of living in the pre- and post-Chávez period, and highlights the remarkably inferior growth of the minimum wage relative to the price level.

Table 2. *The Venezuelan "hyperinflation"*

Item	Apr-74	Apr-98	Inflation 1974-1998	Apr-16	Inflation 1974-2016
Cheese arepa	1.00	800	799,00%	1,000,000	99,999,900%
Small refreshment	0.25	150	599,00%	250,000	99,999,900%
Small coffee	0.25	100	399,00%	250,000	99,999,900%
Cigarettes	1.00	500	499,00%	800,000	79,999,900%
Toronto	0.13	60	47,900%	100,000	79,999,900%
Small beer	1.00	300	29,900%	350,000	34,999,900%
Bus	0.25	100	39,900%	50,000	19,999,900%
Movie ticket	5.00	2,000	39,900%	800,000	15,999,900%
El Universal newspaper	0.75	200	26,567%	100,000	13,333,233%
Minimum wage	450.00	100,000	22122%	11,577,810	2572747%

Source: Cordeiro, José Luis ([1998] 2016). Translation by author.

On July 10, 2016, the Venezuelan government temporarily reopened the border with Colombia to allow Venezuelans to buy scarce basic goods in the neighboring country. The table below shows some current Venezuelan controlled prices in comparison to Colombian prices, as well as calculations of Venezuela's market prices in bolívares and dollars, which represent estimates of Venezuelan prices after lifting price controls and implementing a currency board or dollarization.

Table 3. *Venezuelan vs. Colombian Prices, July 2016*[4]

	Venezuela controlled prices (bolívares)	Colombia market prices (pesos)	Venezuela market prices (bolívares)	Colombia market prices (US dollars)	Venezuela market prices (US dollars)*
Corn flour (1kg)	190.00	2,700.00	1,080.00	0.91	15.98
Wheat flour (1kg)	390.00	2,200.00	880.00	0.75	13.02
White rice (1kg)	120.00	3,000.00	1,200.00	1.02	17.76
Sugar (1kg)	76.00	3,400.00	1,360.00	1.15	20.13
Soybean oil (1l)	58.00	5,500.00	2,200.00	1.86	32.56
Butter (500g)	318.30	2,000.00	800.00	0.68	11.84
Pasta (1kg)	15.00	2,600.00	1,040.00	0.88	15.39
Corn (1kg)	96.50	1,500.00	600.00	0.51	8.88
Beans (1kg)	200.00	2,700.00	1,080.00	0.91	15.98

Sources: Superintendencia de Precios Justos, Ministerio del Poder Popular para la Alimentación, El Nacional Web, XE Currency Converter.

In addition, the current black market rate is likely much more depreciated than the rate that would exist in a unified foreign exchange market without exchange controls. By lifting price controls and freeing the exchange rate at the same time, market forces will very likely lower the free floating rate from current black market levels to possibly as low as a rate of 1 dollar = 67.57 bolívares after a brief adjustment period (see accompanying spreadsheets). However, the rate implied by mechanically using dollar reserves to provide 100 percent backing for the currency seems too strong because the central bank holds some reserves that in a currency board or dollarized system would be held by individual persons or companies, especially PdVSA, rather than be centralized. Therefore, it is appropriate to predict that the new exchange rate would be somewhat above 67.57 bolívares per dollar.

This lower rate will contribute to create a stronger new currency if a currency board is implemented. In a currency board, there is only one fixed price in the system – the exchange rate. While this anchors inflation, all other prices should be free

[4] Prices calculated at the following exchange rates:
USD/VEF Official 07/24/16 = 10
USD/COP Official 07/24/16 = 2951.25
VEF/COP Black Market Jun-16 = 2.5
* Calculated using USD/VEF black market lower bound estimate of 1USD = 67.57VEF

and flexible, ensuring that all relative prices in the economy are true indicators of both absolute and relative values.

Furthermore, in order to accommodate to Venezuela's tradition of socialist policies, a middle ground can be reached whereby the government can still devote a limited amount of its budget towards subsidized goods. The government can then, for instance, allow everyone who has a government-issued electronic shopping card (the Tarjeta de Abastecimiento Seguro that was inaugurated in 2014 to register Mercal users and provide special discounts) to buy a certain amount of each product per month at the subsidized price, but impose no barriers on sales at market prices. This will both satisfy the government's leftist discourse and allow free market price adjustment.

Privatization

Next, as a measure to reduce the costs of goods and services and enhance Venezuela's competitiveness, state-owned enterprises should be privatized, particularly in the energy sector. The privatization of PdVSA would dramatically increase efficiency, productivity and minimize corruption. The enforcement of private property rights directly link the consequences of the use of private assets and their owners' wealth, thereby incentivizing private owners to monitor the behavior of private enterprise managers and employees, ensuring cost-effective production that meets public demands (Hanke, 1987: 976). Privatization of the oil sector should be comprehensive, including current producing oil fields, potential fields and all transportation, storage and refining operations. (Hanke, 2015: 13) Additionally, the aforementioned government-manipulated "joint ventures" with other Venezuelan oil firms should be dissolved in order to avoid an oligopoly. Increased revenues from privatization should be directed towards liquidating Venezuela's debt.

Since privatization can be a lengthy process, while PdVSA continues to operate as a state-owned enterprise, the additional oil revenues from raising gasoline prices from the current controlled prices to the cost of production would

generate a significant source of income to ameliorate the government's deficit. Currently, producing a gallon of gasoline in Venezuela costs roughly US$7.94, while one liter of gasoline retails at 6 bolívares, merely 60 U.S. cents at the official exchange rate and less than 1 cent at the black market rate. Despite an aggressive 6000 percent price increase in February 2016, Venezuela still has the cheapest fuel in the world, and this is a luxury that Venezuelans cannot afford.

Despite holding the world's largest oil reserves, 298 billion barrels, Venezuela's output has been declining in the past two years because of lower investment in its costly heavy crude reservoirs. Production was 2.37 million barrels a day in February, a drop of 90,000 barrels a day compared to its 2014 average, according to the International Energy Agency (see Figure 22).

Figure 22. *Venezuela Crude Oil Production (Thousands Barrels Per Day), 1973-2016*
Source: Energy Information Administration.

The government could be earning an additional US$5.67 per barrel of oil produced, in addition to the already elevated taxes that represent 37.9 percent of barrel cost (US$10.48). Even given the present lower output, the government could be earning US$13,608,000 more per day if gasoline prices were raised to production costs. This would contribute US$ 4,966,920,000 a year towards repaying Venezuelan debt, reducing taxes, or providing subsidies for the poorest Venezuelans (see Figures 5 and 6), and this amount will

potentially increase as PdVSA privatization occurs and as oil prices continue their gradual recovery.

Fiscal Transparency

Finally, monetary and fiscal reform must go hand in hand. The Venezuelan government should be subject to a fiscal reform in order to ensure transparency. This is easier said than done. Ideally, such a fiscal reform would require the government to publish a national set of accounts, which would include a balance sheet of its assets and liabilities and an accrual-based annual operating statement of income and expenses. These financial statements would be required to meet International Accounting Standards and they would be subject to an independent audit (Hanke, 2015: 11).

As mentioned previously, a big advantage of the currency board system is that it imposes fiscal discipline, by eradicating "lender of last resort" activities and central bank credit to the fiscal authorities and state-owned enterprises. This would put an end to the Venezuelan government's rampant fraud and expenditure.

Conclusion

The extensive evidence provided in this paper unravels the causes of Venezuela's current economic crisis, beginning a century ago with the increasing dependence on oil exports and prevalent corruption, to the present day collapse of the Bolivarian Revolution and the various economic failures of the populist socialist state. The monetary reforms of an orthodox currency board system and dollarization both represent efficient and feasible solutions for Venezuela. On the one hand, they address the problem of political intervention and inflation by imposing monetary discipline and rule-based monetary policy. On the other hand, they restore credibility and investor confidence by lowering exchange rate risk and interest rates. Finally, it is necessary to ensure that monetary reforms are accompanied by complementary structural reforms, in order to prevent the collapse of the newly established system. It is up to

Venezuela whether to let the bolívar perish, or perish with the bolívar.

El que manda debe oír aunque sean las más duras verdades y, después de oídas,
Debe aprovecharse de ellas para corregir los males que produzcan los errores.
Mis últimos votos son por la felicidad de la patria.
Si mi muerte contribuye para que cesen los partidos, y se consolide la unión,
Yo bajaré tranquilo al sepulcro.

He who leads must listen to even the hardest truths, and after listening,
He must right the wrongs that lead to errors.
My last vows are for my homeland's happiness.
If my death may help cease divisions and consolidate the union,
I will rest quietly in my grave.

Simón Bolívar

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6 Currency board monetary system: The case of British Honduras (1894-1976)

Preston ***Wessells***

Introduction

Prior to its current era of central banking, British Honduras (now Belize) operated a Board of Commissioners of Currency from 1894 to 1976 to control the issue of notes. Some narrative accounts of the period exist, the most notable being Dr. John Wyeth's book *Belizean Economic History: A History of the Belize Board of Commissioners of Currency (1894 to 1976)*. However, none present the statistics from the period in the machine-readable, high-frequency form necessary for quantitative analysis. Therefore, the novelty of this paper will come from statistical tests and analysis. We provide semiannual statistical data of the balance sheet, with additional data from Blue Books (colonial statistical reports), colonial annual reports, and statistical abstracts.

Several major external events, including World War I, World War II, and the devaluation of the pound sterling in 1949, resulted in significant changes to the Board. Furthermore, the last decade of the Board's operation had several changes as a result of an independence movement causing a desire for

more autonomy. The Board had a more eventful existence than most of its counterparts in other British colonies in the hemisphere.

Our main focus is determining the level of orthodoxy of British Honduras' Board of Commissioners of Currency using statistical tests. This paper does not provide commentary or analysis into other areas of the colony's monetary system. Further analysis of the monetary system should be aided by the statistical data provided in the accompanying spreadsheet.

Origins and works of the government note issue

Until the Board of Commissioners of Currency was established in 1894, the currency system in British Honduras was uncertain and chaotic. Exchanges took place using local export staples — logwood and mahogany in the earliest documented transactions (Wyeth, 1979: 15). Without a currency of its own, the territory switched frequently between the currencies of the neighboring countries. Britain's attempts to introduce U.K. silver after establishing the colony failed to gain popular favor. Immediately prior to the issue of the British Honduras dollar, the main currency in the colony was the silver Guatemalan peso (Wyeth, 1979: 15).

British Honduras finally took steps to regularize the money supply in 1894 with the issuance of its own currency. This change came when the colonial government established the Board of Commissioners of Currency and created the British Honduras dollar (B$) with a one-to-one exchange rate with the United States gold dollar (British Honduras Annual Report 1894: 6; Wyeth, 1979: 16). Local notes were issued in return for U.S. gold coin and the Commissioners of Currency were required to redeem the notes for silver or gold on demand.[1] Gold coins received for the issue of notes became the lone component of currency reserves. This structure meant that

[1] The silver coins paid by the Board had a value as metal substantially less than their face value, so there was no arbitrage opportunity between silver and gold.

there would always be around 100 percent backing of the notes in circulation. One-third of the reserves backing the notes in circulation were invested while the other two-thirds of reserves were required to remain in gold for convertibility (Ordinance No. 32 of 1894). This system created problems due to the limited amount of invested reserves, which yielded minimal revenue compared to what later became the typical currency board model. A ten percent depreciation reserve was created to cover the possible depreciation of the Note Guarantee Fund (Wyeth, 1979: 16). The goal of the Note Guarantee Fund, by rule, was to hold 110 percent of the value of the current issue. Local coins issued were separate from notes and were guaranteed directly by the general revenue of the colony rather than by the currency board (Wyeth, 1979: 17).

World War I prompted the first significant change to the Board when the presence of a German warship nearby put pressure on the government to move the valuable gold stock. British Honduras' gold stock was shipped to the United States in 1914 for safekeeping by the Royal Bank of Canada (the only bank in the colony). Ordinance No. 24 of 1914 was passed to temporarily suspend the convertibility of notes into gold (Wyeth, 1979: 17). When the war ended, the gold remained in the possession of the Royal Bank of Canada with interest paid under the stipulation that notes could be converted into gold within ten days (Wyeth, 1979: 17). Gold was rarely requested due to the acceptability of U.S. dollar notes in exchange for local notes, resulting in the unofficial end of the "classical" gold standard in British Honduras and its replacement by a kind of gold exchange standard.

Several significant changes to the Board occurred in the 1930s. The United Kingdom abandoned the gold standard in September 1931 and, as a direct result, the pound sterling depreciated against the U.S. and British Honduras dollars from $4.86 to $4.03. Fortunately, losses in the Board's reserve account were not devastatingly large because a large proportion of reserves was held in U.S. Treasury bonds at the time (Wyeth, 1979: 19). A formal legal abandonment of the gold standard in British Honduras came in 1937, but gold wasn't completely abandoned until 1939 (Wyeth, 1979: 20). Although

some reserves were required to remain liquid for redemption on demand, they were largely transferred into interest-earning investments. The Note Guarantee Fund was replaced with the Note Security Fund (NSF), and the law stipulated that funds could only be invested in sterling securities (Ordinance No. 1 of 1937).

The outbreak of World War II triggered a rising proportion of trade between British Honduras and Britain because of British demand for wartime supplies. To maintain a stricter degree of exchange control, an ordinance was passed in 1940 to operate a Special Sterling Account in London through the Royal Bank of Canada (Wyeth, 1979: 21). This account had no impact on the exchange rate with the U.S. dollar and the rate of exchange with sterling was allowed to fluctuate as usual. An excess of demand for sterling in exchange for British Honduras dollars resulted in the account operating in credit until 1949 (Wyeth, 1979: 21).

Dramatic change occurred in 1949 from a confluence of factors. The main problem was that the British Honduras dollar was caught between sterling as a trading currency and the U.S. dollar as the anchor currency. To prevent a loss of foreign reserves at the then overvalued exchange rate of sterling, Britain and countries linked to sterling, known as the sterling area, imposed exchange controls against outside currencies. Sterling exchange controls against the U.S. dollar were extended to the British Honduras dollar. Therefore, there were partial exchange controls between the British Honduras dollar and the currency to which it was anchored. This lack of full convertibility into U.S. dollars prevented the currency board from being fully automatic by adjusting to a trade deficit as it would have done in an orthodox currency board system (Wyeth, 1979: 25). Additionally, a severe drought caused crops to fail and the slump in the U.S. markets resulted in a decline in demand for British Honduras' main exports (Wyeth, 1979: 26).

The market value of British Honduras's reserves in the Note Security Fund fell dramatically in September 1949 when sterling was devalued against the U.S. dollar by about 31 percent (Wyeth, 1979: 26). All reserves in the Note Security

Fund were held in sterling securities, resulting in a decline in value of the reserve account by approximately B$280,000. Additionally, the Special Sterling Account fell in value by around B$500,000 and many other government accounts were held in sterling, bringing the estimated total losses to over B$1.5 million (Wyeth, 1979: 27). To put that in perspective, British Honduras only had B$837,000 notes in circulation at the time and its population was about 68,000. Side effects of the devaluation included a sharp decline in British investment in the colony and a decline in exports to the sterling area (Wyeth, 1979: 27), possibly as a result of events described in the next paragraph. However, most trade occurred with the dollar area. Devaluation of the British Honduras dollar against the U.S. dollar caused significant negative impacts on importers and local consumers. Trade with the United States was on the decline, but mostly due to the increased exchange controls and a slump in U.S. demand for timber rather than to any issues connected with the exchange rate (Wyeth, 1979: 28). Imports from the dollar area decreased from £1,545,000 to £893,000 and exports to the dollar area decreased from £1,039,000 to £532,000 from 1948 to 1949 (Statistical Abstract: 1952).

British Honduras Governor Sir Ronald Garvey was responsible for the decision to devalue the local currency. He continually denied that the government would take any actions for three months following the devaluation of the pound sterling in September 1949. Garvey's lack of action gave speculators time to cause an insurmountable deficit to the Special Sterling Account (Wyeth, 1979: 28). When the time came, the Legislative Assembly refused to pass the devaluation legislation, forcing the Governor to use his reserve powers[2] to devalue the currency on December 31, 1949 (Wyeth, 1979: 29). A nationalist movement called the "People's Committee" formed as a direct result on the negative effects of the devaluation on the income of most inhabitants of the colony (Wyeth, 1979: 30).

[2] Reserve powers enabled the governor to override the legislature under certain circumstances, but the implicit understanding was that use of those powers would be rare.

Sir Ronald's devaluation restored the value of the sterling reserves to more than 100 percent of notes in circulation and raised the British Honduras dollar value of the interest earned. However, the value of the government's Special Sterling Account in the Royal Bank of Canada accumulated losses of well over B$500,000 during the three months of uncertainty (Wyeth, 1979: 31). Speculators exchanged British Honduras dollars for pound sterling through the Special Sterling Account during the months between the sterling devaluation and the corresponding B$ devaluation. The account accumulated a deficit of B$79,000 worth of sterling in the London account due to speculators acquiring large quantities of the British currency. Furthermore, the British Honduras government owed the Royal Bank of Canada over B$500,000 because of the market value loss of the British Honduras dollars that the bank held when the currency was devalued (Wyeth, 1979: 30). Barclays Bank had also opened similar account in 1949 before the devaluation of sterling and experienced the same losses as the Special Sterling Account. The total cost the Board had to make up due to these two accounts totaled almost B$1 million; however, most of these losses were paid for by the Bank of England and some of the rest by the British government (Wyeth, 1979: 31).

British Honduras' devaluation crisis resulted in the end of the link to the U.S. dollar. The currency was instead fixed to the pound sterling at a rate of B$4 to £1 (British Honduras Annual Report, 1949: 18).

As was the case with other British colonial currency boards, the British Honduras Board was allowed to hold significant amounts of local assets beginning in the 1950s. In 1958, a fiduciary issue of B$350,000 was authorized; however, the Board did not actually purchase government bonds until 1967 (Ordinance No. 24 of 1958; Ordinance No. 6 of 1965). Coins were brought under control of the Board in 1965, which placed an increased burden of reserve backing on the Currency Fund (previously the Note Security Fund) (Wyeth, 1979: 54 n. 6). The B$500,000 worth of domestic assets purchased in 1967 was approximately equal to the burden caused by the addition of coinage. (The government apparently did not transfer any

assets to the Board corresponding to its new liability for coins.) In 1970, an additional B$500,000 of local bonds were purchased, bringing the total value to B$1 million (Wyeth, 1979: 37). These fiduciary issues were an attempt to reduce the cost of the currency reserves (Wyeth, 1979: 38).[3]

Several major changes came in the 1970s before the Board was replaced at the end of 1976. In 1972, British Honduras' government was given authority to change the exchange rate with sterling after consulting with the International Monetary Fund and the Board (Wyeth, 1979: 36). Also in that year, the pound sterling began to float against the U.S. dollar in June as part of the breakdown of the Bretton Woods system of pegged exchange rates, which had been established in 1945. In anticipation of its independence from Britain, British Honduras was renamed Belize in 1973 and the currency became the Belizean dollar. Fluctuations in exchange rates prompted an ordinance in 1975 that allowed Belize's currency to be linked to the U.S. dollar, Special Drawing Rights of the IMF, or gold (Wyeth, 1979: 36). The anchor was shifted to the U.S. dollar in May 1976 at a rate of B$2 to US$1 due to a continuing decline of sterling against the U.S. dollar (Wyeth, 1979: 36). Ultimately, the Board of Commissioners of Currency was replaced at the end of 1976 in favor of a Monetary Authority (Wyeth, 1979: 36).

To what extent was the board of commissioners of currency a currency board?

An orthodox currency board's key characteristics are a fixed exchange rate with an anchor currency; unlimited convertibility between its notes and coins and the currency to

[3] The cost of holding foreign reserves rather than local assets is the difference between the usually higher interest rate that local assets pay and the usually lower interest rate available on safe foreign assets. Local assets are usually riskier and less liquid than safe foreign assets, though—a point often neglected in the debate about the cost of 100 percent foreign reserves that occurred among economists from the late 1940s to the early 1960s (Schuler 1992: 113-116; 121-123).

which it is fixed; and at least 100 percent net foreign reserves backing the monetary base (Hanke, 2002; Imam, 2010). The primary function of a currency board is to supply a stable, convertible currency that facilitates market exchange. To what extent did the Board of Commissioners of Currency of British Honduras operate with these characteristics during its operation from 1894 to 1976?

At the original issue of British Honduras dollars, the notes, but not coins (which were not then issued by the Board), were fully backed by gold and external financial assets. Only one-third of the reserves could be invested; the rest were kept in gold for convertibility. British Honduras' use of gold rather than a foreign currency as the anchor was not uncommon before the 1930s but is not what people today think of as typical for a currency board. It did not have a large effect on the key characteristics of the operations of the Board. An ordinance was passed in 1937 that formally ended the "classical" gold standard in British Honduras, although gold was essentially out of use as early as 1914.

A major deviation from currency board orthodoxy occurred in 1949 when exchange controls and regulation of trade with the United States were implemented to reduce the strain on the reserves. The British Honduras dollar no longer had unlimited convertibility with the U.S. dollar, its anchor currency. Furthermore, the devaluation of the pound sterling during 1949 resulted in a major devaluation of the Board's reserves due to the stipulation that the Note Security Fund was required to be invested in sterling securities. This caused a massive decline in the net foreign reserves relative to the monetary base. Ultimately, the Board was forced to devalue the British Honduras dollar relative to the U.S. dollar and changed its anchor currency to the pound sterling. A devaluation was necessary to bring the reserves in line with the notes in circulation, but the three-month period of uncertainty caused lasting damage.

Other deviations from orthodoxy occurred, most notably in the last decade of the currency board's operation. British Honduras changed significantly from 1965 to 1976 as the colony pushed for more independence and autonomy from Britain.

This movement included direct legislative changes to the Board of Commissioners of Currency. A timeline of important events and legislation relating to the currency board can be found in the Appendix.

The data and our tests

We digitized semiannual balance sheet data on the Board of Commissioners of Currency from 1894 to 1976. The main source for our data was the British Honduras *Government Gazette*. Other data came from the British Honduras *Blue Book* (annual colonial statistical report), the colonial annual report (aimed mainly at a British audience), and *Statistical Abstracts* for the British colonies. We performed tests on the balance sheet items of the Board of Commissioners of Currency. We could not find data for some scattered years and for three long periods. The missing data make it difficult to determine the level of orthodoxy of the currency board for its entire 82-year operation.

Test One: Domestic Assets, Foreign Assets, and the Monetary Base

We first measured net foreign assets as a share of the monetary base, in Figure 1. An orthodox currency board should operate with net foreign assets typically between 100 and 110 percent. Figure 1 only shows the available data and omits gaps where data was unavailable. There are several long periods where data on the assets of the Board were unavailable, which makes analysis of the entire 82 years of operation impossible. We provide the "discrete" version showing gaps in the data in the accompanying spreadsheet workbook.

Despite large gaps in the data, it is apparent in Figure 1 (next page) that the British Honduras Board of Commissioners of Currency operated at or above 100 percent for most of its existence. From 1898 to 1914, the ratio hovered around 100 percent. It was during this period that the Board operated on a gold standard. Clearly, the Board operated in a disciplined manner during this time leading up to World War I. The ratio fluctuated more after 1914, likely due to the unofficial end of

the gold standard causing changes in the operation of the Board. Some of the large spikes before 1949 are explained by fluctuations of the sterling against the U.S. dollar, to which the British Honduras dollar was fixed at the time. There were several years when the ratio dropped below 100 percent for unexplained reasons. The biggest drop occurred in 1961, when reserves fell to around 75 percent of the notes in circulation. Unfortunately, there are limited data for this multi-year fall below 100 percent. However, the reserves returned to almost 110 percent by 1964 and never fell below the orthodox level for the remainder of the currency board's existence.

In an orthodox currency board, net domestic assets of monetary composition should be zero or close to it. Figure 2 shows that the British Honduras Board of Commissioners of Currency operated with zero percent domestic assets for most of its operation. Only in the last ten years before the currency board was abandoned did it begin investing domestically. However, the investment was capped at B$1 million and was a reaction to the Board taking over coins in circulation from the government. Although adding coins to the reserve backing brought the British Honduras currency board in line with orthodox currency boards, the use of a substantial percentage of domestic assets pushed it further into the realm of unorthodoxy during this period.

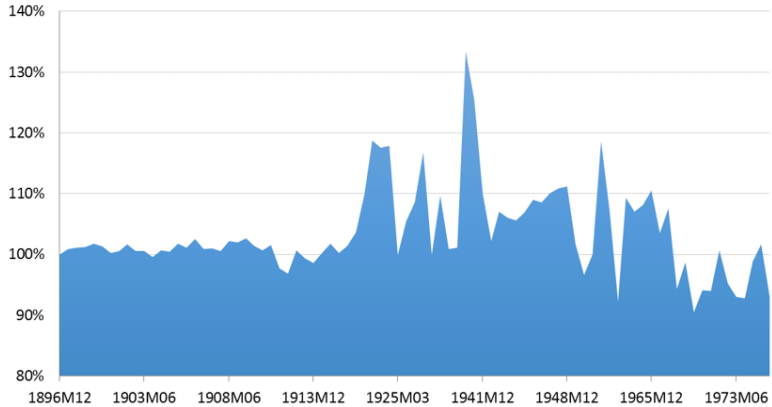

Figure 1. *Foreign assets as a percentage of the monetary base*
Main Sources: British Honduras Government Gazette; calculations.

Figure 2. *Domestic assets as a percentage of monetary base (continuous)*
Main Sources: British Honduras Government Gazette; calculations.

Test Two: Reserve Pass-Through

As we know from the legislative history, British Honduras' currency board was not the most orthodox. However, our first test showed that the Board operated in a mainly orthodox manner in terms of reserves as a percentage of the monetary base. However, the first test was only one of several crucial tests to determine orthodoxy. Our second test measures year-over-year change in the monetary base divided by year-over-year

change in net reserves. An orthodox currency board should operate at a rate "close to 100 percent" but more likely "within a range of 80 to 120 percent" (Hanke, 2008: 280). Ideally, if net foreign reserves rises (or falls) by a certain amount, the monetary base should rise (or fall) by the same amount (Hanke, 2008). This would result in a reserve pass-through of 100 percent.

Unfortunately, there are many large and small gaps in the data due to unavailability. Figure 3A in the accompanying spreadsheet provides the "discrete" version of the reserve pass-through, showing where gaps exist in the data. The major periods of missing data are 1914 to 1921, 1924 to 1939, and 1948 to 1964. Additionally, the first year after each gap in data is not shown because of the use of the year-over-year calculation. Despite the large gaps, the data that is available provides an adequate view into the operation of the currency board.

Figure 3 displays reserve pass-through for British Honduras in years with data availability. The data range from just over 500 percent to around negative 60 percent. Aside from a spike to over 400 percent in 1901, the Board operated with reserve pass-through levels around 100 percent until 1911. This orthodox reserve pass-through is consistent with the results for this early period from the first test. After this period, the currency board of British Honduras operated with a much more sporadic reserve pass-through ratio. Large positive spikes occurred in 1912, 1941, and 1973. The only time the currency board had a negative reserve pass-through was in 1940. There was a large depreciation of sterling against the dollar in 1939, which is a possible explanation for the decline in the value of reserves while the monetary base increased (Wyeth, 1979: 19). The limited available data from the 1960s show a reserve pass-through close to the orthodox level. Ultimately, the British Honduras Board of Commissioners of Currency appears orthodox in its early years, but then fluctuated between high and low reserve pass-through ratios for many of the remaining years. The lack of consistent data for many long periods of time makes a conclusion about the level of orthodoxy by this measure difficult; however, it is apparent that the Board failed to hold the ratio around 100 percent after its early years.

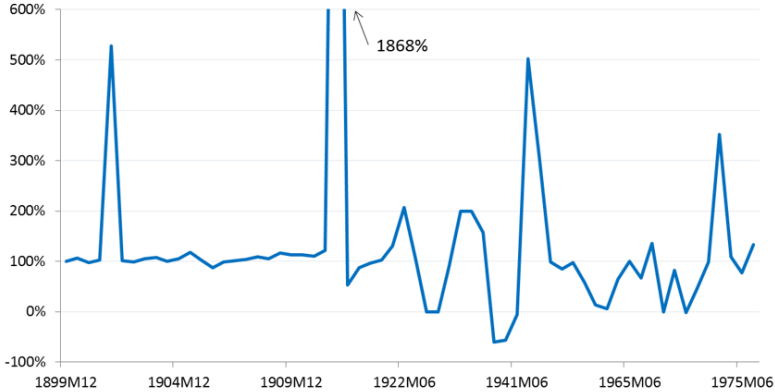

Figure 3. *Reserve pass-through (%) (100%=currency board orthodoxy) (continuous)*
Main Sources: British Honduras Government Gazette; calculations.

Test Three: Changes in Monetary Base and Net Foreign Assets

Our third test measures annual changes in the monetary base and changes in net foreign assets. When net foreign reserves rise (or fall) by a certain amount, the monetary base should also rise (or fall) by that same amount (Hanke, 2008). Therefore, the two lines should be identical in the simplest case of an orthodox currency board. However, in practice the lines can deviate to some extent even with an orthodox currency board because of factors such as timing of income and expenditures, capital gains or losses, and other managerial or accounting practices.

Figure 4 measures annual changes in the monetary base and changes in net foreign assets. Figure 4 is continuous and only shows the available data. We provide the discrete version, Figure 4A, with the missing data in the accompanying spreadsheet workbook. The first year after gaps in data is not shown because of the use of the year-over-year calculation.

Figure 4 shows a tight link between the annual change of the monetary base and the annual change of reserves. Several small deviations exist; the most notable occurred between 1971 and 1972. The two lines follow each other closely for the rest of the years with data availability. The lines match closely even when

the year-over-year change fluctuates dramatically in the last ten years of the currency board's existence. The change of the reserves follows the change of the notes in circulation closely even during the years with a large amount of change. Furthermore, the board shows a strong correlation of 0.96.

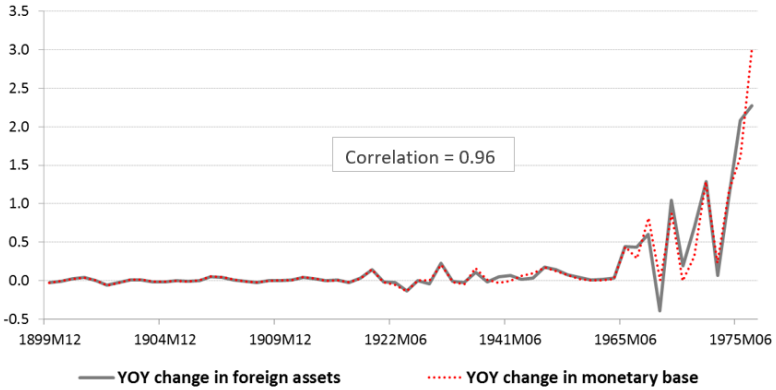

Figure 4. *Changes in monetary base and foreign assets (continuous) (million B$)*
Main Sources: British Honduras Government Gazette; calculations.

Despite small deviations, the British Honduras Board of Commissioners of Currency appears to have operated as an orthodox currency board according to this test. It is impossible to know what occurred during the extensive gaps in data. However, the strength of the link in this test during the years of available data is enough to conclude that the currency board operated in an orthodox manner for most of its existence. The minor deviations are likely due to fluctuations in the exchange rate. For example, a small deviation is visible in 1940, which can be explained by the devaluation of sterling against the dollar in 1939.

Interestingly, the British Honduras currency board strayed significantly from orthodoxy in the reserve pass-through, but appears orthodox in Figure 4. This can be explained by the scale of Figure 4 and the nature of the test for Figure 3. In years with small changes in either the monetary base or the reserves, the reserve pass-through could show a large percentage difference when, in actuality, the difference was still only a few thousand

dollars. Therefore, I believe this test is a more accurate view into the level of orthodoxy of the currency board as it is not prone to abnormal spikes due to relatively tiny differences in assets and liabilities.

Conclusion

Data analysis and the legal framework of the British Honduras Board of Commissioners of Currency result in somewhat conflicting determinations of the level of currency board orthodoxy. In legal terms, the currency board had unorthodox laws. British Honduras' currency board operated entirely on the gold standard until World War I began in 1914. Despite being fixed to the U.S. dollar, the Board restricted convertibility with the U.S. dollar by imposing exchange controls in 1949. After an ordinance was passed in 1957, the Board acquired B$500,000 of domestic assets in 1965, coinciding with a like amount of additional liabilities in the form of the coin issue, which it took over from the government. It purchased an additional B$500,000 worth of domestic assets in 1970 to bring the total to B$1 million, roughly equivalent to 18 percent of currency in circulation. An ordinance was passed in 1972 that allowed the government to change the exchange rate with sterling. Furthermore, the anchor currency changed to the U.S. dollar in 1976 in a reversion back to its original anchor.

The legal framework suggests that British Honduras' currency board was at times orthodox and at other times unorthodox. The statistical tests provide more insight into the details. All three of the tests support the conclusion that the early years of operation were orthodox. Net assets of the monetary base held steady around 100 percent or above for the years until the outbreak of World War I. The reserve pass-through showed little deviation between the annual year-over-year change in the monetary base and reserves. Finally, our last test showed a strong link between the change in the monetary base and net foreign assets. Therefore, the British Honduras was orthodox until 1914. Unfortunately, the data for the rest of the decade until the 1920s is missing.

In the currency board's final decade, it was decidedly unorthodox for numerous reasons. Domestic assets made up a sizeable portion of the reserves. The reserve pass-through ratio spiked during this time and a small, but larger than normal, deviation occurred in the changes in monetary base and net foreign assets. Passing legislation to allow the change of the exchange rate was a major deviation from orthodoxy. So was changing the anchor currency, though perhaps here we should make greater allowances, because when the currency board was established the underlying assumption, generally validated by experience, was that exchange rates among the major international currencies would be quite stable, hence the particular choice of anchor currency was not as important as it became once that assumption no longer held.

After 1914, the British Honduras currency board performed marginally worse in the orthodoxy tests. Several large spikes and dips occurred in net foreign assets as a percent of currency in circulation, but the currency board remained in the 100 to 110 percent range for most of the years with available data. The currency board fluctuated in the reserve pass-through ratio for the years with available data. The changes in the monetary base and net foreign assets followed closely with only small deviations. It is difficult to determine the level of orthodoxy for the currency board after its early years due to large gaps in data. However, it does appear from the tests that the Board operated in an orthodox manner for most of its existence.

Although this study gathered and digitized data from 1894 to 1976, there are several years when data are incomplete. The gaps may not affect the significance of the statistical tests, but possible future studies may want to gather the missing data and hence confirm the reliability of the current study.

Postscript: Companion Spreadsheet Workbook and Source Documents

The companion spreadsheet workbook to this paper contains the underlying data, calculations, and graphs. It shows both the graphs in the paper, which omit periods for which data are missing, and graphs that show where the gaps in the data lie. The workbook also contains some data not used in the paper. Data come from the *Government Gazette,* the Blue Books, and the annual reports of British Honduras published in London. For data of the currency board, preference was given to figures published in the *Government Gazette,* which were the most detailed. Gaps were filled with figures from the Blue Books and the annual reports, where available. The main source of publications was the Library of Congress. It should be possible to fill many of the gaps in data by locating the missing issues of the relevant publications in libraries in the United Kingdom or Belize, which it was not possible to consult for this paper.

Appendix

Appendix. British Honduras Currency and Legislation, 1894-1976

Here, we provide a brief discussion of the legal framework of the British Honduras currency and legislation that related to the Board of Commissioners of Currency (see also Krus & Schuler 2014: 44-48).

- 1894: Board of Commissioners of Currency established by Ordinance No. 32
    - British Honduras dollar fixed to United States dollar: B$1 to US$1
    - Board controlled the issue of notes and rules; coins not included
    - Investments in sterling securities required a Depreciation Fund to cover fluctuations in the value of the reserves
- 1903: The Bank of British Honduras became the first commercial bank in the colony
- 1912: The Royal Bank of Canada purchased the Bank of British Honduras
- 1914: World War I gold convertibility informally ceased due to the movement of gold to the United States for safekeeping by the Royal Bank of Canada
- 1930s: U.S. dollar notes were used in British Honduras in unknown quantities
- 1937: Removed gold backing in reserves with Ordinance No. 2 of 1937
    - 1939: Finally excluded gold backing
- 1937: Ordinance No. 1: Note Security Fund replaced the Note Guarantee Fund
- 1940: Special Sterling Account in London operated by the Royal Bank of Canada to establish full convertibility between British Honduras dollars and sterling (still pegged to U.S. dollar, so the exchange rate with sterling fluctuated)
- 1949: Exchange controls established with U.S. dollar limiting full convertibility due to a strain on reserves
- 1949: Sterling devalued against U.S. dollar by 31 percent on September 18
    - Total fall in value of government accounts: B$1.5 million
    - Speculators began speculating against the British Honduras dollar
    - British Honduras broke link with U.S. dollar and devalued the British Honduras dollar on December 31
    - Delay and devaluation cost the value of the Special Sterling Account; speculators successful due to full convertibility with sterling (almost B$1 million lost)
- 1950: Switched to sterling as anchor currency at B$4 to £1

- 1958: Fiduciary issue of B$350,000 authorized
- 1965: Note Security Fund becomes the Currency Fund; coins are added to notes for reserve backing by the Board
- 1965: Maximum value of fiduciary issue increased to B$1 million
- 1967: Purchased domestic bonds worth B$500,000
- 1970: Total of domestic bonds increased to B$1 million with purchase worth B$500,000
- 1972: British Honduras becomes Belize; government granted authority to alter the rate of exchange with sterling (which itself began to float against the U.S. dollar)
- 1975: Ordinance allowed link with sterling to be cut
- 1976: Fixed to U.S. dollar again at rate of B$2 to US$1
- 1977: Board of Commissioners of Currency replaced by Monetary Authority

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7 Did Argentina have a currency board in the mid 1880s?

Adria *Haimann*

Introduction

My chapter was part of a larger project to determine how currency board monetary systems have performed. The goal was to find information about the note issue of Argentina's Banco de la Provincia in the mid 1800s in order to determine if Argentina had a currency board system. I also tried to find answers to the questions of why the note issue arrangement was established, how it worked organizationally and why it was replaced.

The majority of the information I found came from the book *El Banco de la Provincia* by Osvaldo Garrigos. Other accounts of this period include *Straining at the Anchor: The Argentine Currency Board and the Search for Macroeconomic Stability* by Gerardo della Paolera and Alan Taylor and *La economía argentina en el largo plazo* by Roberto Cortés Conde, but they are less detailed in their descriptions of the history of the Banco de la Provincia.

Description of findings

Why was the note issue arrangement established?

The Banco de Buenos Aires was created in 1822 in an effort to stabilize the local economy wrecked by the Argentine War of Independence against Spain. The newly founded institution became known as the Banco de Descuentos (Discount Bank) because of its role as a source of credit to the local banks in the mainly rural province of Buenos Aires. Shareholders in the bank included local landowners, professionals, military, government officials and Spanish, German, French and British nationals. In 1826, the bank was reorganized and became known as the Bank of the United Provinces of the Rio de la Plata. This newly defined institution had a role as a national bank because the federal government acquired a stake. The first national mint was later opened at the bank as an annex. In 1854, after some political conflict regarding the role of the bank, the bank was transformed into the Banco de la Provincia (Bank of the Province of Buenos Aires), which retained its function as a national and provincial mint. From the mid 1860s to the 1870s the Banco de la Provincia held a monopoly in note issuing; however, citizens were able to make deposits at smaller local banks. The Banco de la Provincia was located in La Plata, the capital city of the Province of Buenos Aires.

In the late 1850s, Argentina had great financial needs due to the aftermath of the Platine War. Also known as the War against Oribe and Rosas, the Platine War lasted from August 1851 to Feburary 1852 and was fought between the Argentine Confederacy and an alliance consisting of the Empire of Brazil, Uruguay and the Argentine provinces of Entre Ríos and Corrientes. The war was between Argentina and Brazil for influence over Uruguay and Paraguay, and hegemony over the regions bordering the Río de la Plata (River Plate). The Platine War increased the economy's financial needs because it damaged sources of income of trade, industry and development of credit. In response to the economic problems, the national Argentinan government ordered that the public treasury print 200 million pesos in paper money. On December 31, 1854 the amount of money the treasury had issued was 210,247,636

pesos. Six years later on December 31, 1861, it was 378,717,656 pesos (Garrigos, 1873, 124).

The most crucial laws regarding the issuance of paper currency were those in 1859 and 1861, which ordered for 160 million pesos to be printed. The intention of these laws was to finance government budget deficits. Furthermore, these laws created additional *derechos de importación y exportación*, literally "rights of importation and exportation," but more accurately rendered as customs duties required to be paid in specific kinds of currency. A considerable mass of paper money was emitted by the state and for the state, creating an oversupply of currency that led to a depreciation of the currency against gold and silver. Before this law inflation was relatively stable however after the law was passed inflation levels rose.

Before these issues occurred, paper money was accounted for separately from gold and silver in business dealings. The government was not positive how to defend the price of pesos for gold and eventually agreed upon 361 pesos per ounce of gold (125). By 1863, one ounce of gold was worth 450 paper pesos (Olarra Jiménez 1968: 27, 30). Olarra Jimenez (1968: 181-2) shows average annual exchange rates for this period and beyond.

During the period of 1854 through 1861, financial disorder occurred, leading to widespread bankruptcy. Argentines were worried about paper money being detrimental and paralyzing business and progress of the country and the Banco de la Provincia. There was a huge interest burden that led to a massive economic weakening. Public dissatisfaction led to an eventual overthrow of the government by a rival democratic faction that came into power on March 5, 1854.

The overthrow of the government produced panic. As a result, gold-denominated deposits increased relative to paper-denominated deposits. The Banco de la Provincia needed money to be able to pay withdrawals from gold deposits and was therefore obligated to buy metal at unfavorably high prices, suffering a loss of reserves. Furthermore, this action was harmful to the paper currency. In order to address this problem the Banco de la Provincia wanted to determine how

deposits of metal affected the value of paper. More specifically, the bank was looking to find out if deposits of metal were good or bad for the value of paper money and if it was convenient to limit the quantity of paper money (Garrigos, 1873, 127).

The director of the bank claimed that deposits of metal were helpful to paper money. He explained that expansion of paper money produced benefits that increase employment and activate capital instead of just sitting in the bank, something common for the time because citizens possessed a saver's mentality. He proposed to expand the use of paper money in order to allow the state a means of earning its income. (Garrigos, 1873, 128-129).

His proposal led to the Decree of March 10, 1862 (Garrigos, 1873, 129), which stated that purchases carried out by public offices must be in paper money. In cases where it was necessary, public offices could fix the price of paper money in metal, but upon expiry they must have an equivalent quantity in paper money. Written contracts that covered foreign commerce and spending must be converted to paper money when possible. The Treasury, and an association of leading merchants, created demand for paper money by using it in their transactions, giving the paper currency some credibility and stability.

Until this point, the custom of businesses was payment in gold or silver coins. With the new decree, businesses bought raw materials in paper money and paid wages in paper money; however, they still sold their products in exchange for metal. This led to the disadvantage of double monetary exchange. The association of merchants wished to conduct exchange solely in paper money, but a compromise was necessary between sellers and buyers in order for this to be possible. In order to achieve this goal, on March 29, 1862 an initiative was created stating that beginning on April 1, 1862 the branch of commerce (Bolsa de Comercio) of the Stock Exchange would only buy using paper money. During this time, the Buenos Aires stock exchange handled stocks and additional commodities, including mortgages.

Due to the religious nature of the populace, great care was placed on satisfying laws of repayment. This led to a popular

desire to see excess currency disappear. People did not want the use of metal to be the only way to stop fluctuations in the exchange rate and credit markets. Instead, they wished to improve the quality of the paper currency and to re-establish equilibrium between paper money and gold or silver coins. This was a radical idea for the time, because it emphasized the power of the state in stabilizing the value of the currency as opposed to the conventional idea that equated stability with gold or silver coinage. Thus, there was a need to inspire confidence in loans from the state and the state's credit. Furthermore, the government needed to dissipate the fear that new issues of currency were bad for the economy. Many believed there was a need for a change in the political institutions of the country, which they considered to have limited growth of the population, commerce and industry and to have been harmful to public and private wealth (Garrigos, 1873, 133).

How did the note issue arrangement work organizationally?

The Public Treasury needed the Banco de la Provincia as a powerful instrument to reconstruct the economy. Commercial relations with the national government considerably widened the Bank's operations and multiplied its utility. This gave credit to paper money and was the cause and occasion for the Nation's loans (Garrigos, 1873, 137). Also, the Banco de la Provincia had the authority to issue bank notes. These notes were from Buenos Aires and were acceptable in the entire republic. The re-establishment of peace throughout the country in the early 1860s allowed the bank to extend its lending and deposit-taking business, and gain public confidence. This showed that there was an overall benefit of the Bank having more freedom to perform services to improve the well-being of the country.

The primary concern of the Banco de la Provincia was to improve the condition of the circulating medium (Garrigos, 1873, 138). The Bank wanted to avoid sharp oscillations of the supply of paper money, which had occurred in the past, and thus needed to back the paper money with metal to have a

guarantee of its value. To achieve metal backing, the plan was to hire an outside agency to re-establish the balance paper money and coins. In 1863 credit was opened to the bank with the government's guarantee. Interest rates and repayments were recovered regardless of the effect on the national income affected by the repayment of emissions (Garrigos, 1873, 139).

In 1863, the Bank's directors decided to establish what was in effect a dual currency system. This system stated that if a person deposited gold they would be repaid in gold. If the deposit was in paper money, they would be repaid in paper money. If gold was borrowed from the bank then the repayment had to be in gold, not paper money. If the deposit was made using foreign currency, meaning currency convertible into gold at a pegged rate, then the bank would keep the amount in pesos fuertes, a gold-denominated currency.

The Law of November 3, 1863 guaranteed the value of paper money. One peso fuerte ("strong peso") was equivalent to twenty-five paper pesos (Garrigos, 1873, 142). There was a need for a fixed financial instrument and therefore the benefit to trade and security that this law brought outweighed the harm of potential instability. The Banco de la Provincia was the only bank in Argentina allowed to issue these bank notes. This was because the government thought it was dangerous to let other banks issue notes that could add to the supply of those issued by the Banco de la Provincia.

Other banks wished to operate in a monetary system where the currency had a rigid exchange rate. Thus, the Banco de la Provincia wanted to remove inconvertible paper money from the economy and replace it with the new paper money. The directors of the bank wanted to reassure the public by guaranteeing constant convertibility (Garrigos, 1873, 145). Laws of May 5, 1865 and Oct 10, 1865 helped with the fixation, stability and establishment of the value of paper money.

The Law of January 3, 1867 stated that the Banco de La Provincia was authorized to return 25 paper pesos for one peso fuerte or one peso fuerte for 25 paper pesos to whoever asked. The Bank would give paper money to the customer in exchange for gold received.

The Office of Exchange was established, as a separate part of the Banco de la Provincia, to indicate that currency exchange was separate from other transactions performed by the bank. The Office of Exchange kept a separate balance sheet from the Banco de la Provincia. Gold was still accepted in the economy; however, people liked to exchange it for paper money because of the convenience of paper money. It is important to note that the Office of Exchange was not creating paper money; it was only exchanging paper money with the equivalent gold value. In 1872, 15,413,202.1 ounces of gold was stored in the Office of Exchange, indicating a prosperous seven years and an increase in reserves (Garrigos, 1873, 150). This economic prosperity was due to better commercial customs, improvement of credit and expanse economic development. The capital of the bank, which included gold and paper components, rose to a sum of 6,778,622.1 pesos fuertes and 39,374,110 paper pesos. One of the main reasons for the increase in the capital of the bank was due to the sales of land. Under the law of December 1864 the sales of land were used to increase the capital of the Banco de la Provincia (Garrigos, 1873, 150).

A crucial aspect of the law regarding the bank note issue arrangement was that the bills created by the Banco de la Provincia must be accepted in all regions of Argentina. From 1866 to 1869, the amount of bills issued by the Banco de la Provincia was limited to the amount of 4,000 pesos fuertes per year because of the Law of Oct 22, 1866 (Garrigos, 1873, 151). In 1870, the limit was widened to 6,000 pesos per year and thus 5,900.58 and 5,712.42 notes were issues in the years 1871 and 1872 respectively (Garrigos, 1873, 152).

During the early 1870s the public was generally at ease with the actions of the Banco de la Provincia. Bills emitted by the Office of Exchange had a constant base and were guaranteed conversion into gold. Furthermore, the public was content with the fact that the Banco de la Provincia had a yearly limit on the emission of bills. Paper money was slowly introduced into everyday business transactions. Although some people feared depreciation of the money, it did not occur early on and people actually preferred the paper money to coins. Thus, during this period of time the bank had considerable power to

help commerce and industry. It was a time of prosperity and with the resources of the bank, train tracks, factories, theaters and public works offices were built. As this was occurring commerce was still widening. Aside from building up the economy, the bank continued to focus on maintaining low interest rates to avoid political or commercial crisis.

Why was the note issue system replaced?

In 1873, economic troubles arose that exhausted the resources of the Banco de la Provincia. Some of Argentina's economic problems were attributable to the worldwide trend of economic problems of 1873, including a panic in Austria, tight financial market conditions leading to high interest rates in London, the leading center for "emerging market" finance at the time, and a financial panic in the United States in October. One important problem in Argentina was the loss of value of mortgage securities. This was because of disorderly speculation in land, which led to under-the-table cash transaction that, contemporary observers thought, led to cash shortages and a consequent elevation of interest rates (Garrigos, 1873, 158). Furthermore, unfavorable prices for Argentinean products in consumer markets led to stagnation in the market, forcing the Banco de la Provincia to pay off a major part of imports with their gold resources. Also, there was a sudden commercial disruption in Uruguay that also caused an outflow of gold. The quantity of gold in the Office of Exchange dropped by more than 4,000 pesos (Garrigos, 1873, 158).

It was becoming clear that the resources of the Banco de la Provincia were far from inexhaustible and that the Bank was limited by its credit. Furthermore, the Bank could not passively escape the course of the financial events that occurred and needed to moderate its actions in precaution of contingencies that could seriously compromise its status. Thus began a debate over the operation of the Banco de la Provincia. A new charter provision of organization was created to eliminate the aspects of the current regime that disrupted credit. An attempt was made to create laws that prevented reckless discretionary

acts by the Bank.

The primary goal was to answer the altered credit problem. In the early to mid 1870s it was known that there was a defect in the execution of the law of 1864 (regarding the conversion of money), which the directorate of the bank did not recognize at the time. The defect was related to the conversion to paper money and since it was improperly carried out for several years, problems with the Banco de la Provincia arose. A lot of debt accumulated due to the new western railroad as well as from provincial governments. Ultimately, there was a fundamental problem with the inability to convert the paper money and immobilization of deposits and repayments, which did not work as smoothly as anticipated. The Bank had 3,529,411 pesos fuertes and owed roughly 7,000,000 pesos fuertes (Garrigos, 1873, 160). To make matters worse, a significant quantity of the Bank's assets was in mortgages, which were illiquid. The quantity of money that the Bank needed to move was significantly less than the amount of money to which they had access.

In order to prevent a bank failure and public outcry, the Banco de la Provincia was well aware that they needed to honor their debts. The administration of the Banco de la Provincia worked hard to maintain public calm by limiting the means of taking out a principal part of the Bank's resources meaning that they restricted the ability of depositors to withdraw deposits. A transformation to the system of the Banco de la Provincia was necessary but they did not want to hike interest rates, curtail loans nor damage the state of credit.

Unfortunately, legislators could not resolve the Bank's problems without abandoning the existing constitution of the Bank. In 1876 the Office of Exchange was closed because people were exchanging paper pesos for gold in quantities too large for the Bank to sustain itself. A new bank system was established that eliminated the bank note system that existed from 1867 – 1876.

Was the note issue arrangement a currency board?

The aspect of the note-issue arrangement which shows

evidence that this system was not a currency board is the fact that a currency board cannot make independent monetary policy nor can the government print unbacked money. During the period 1867-1872 the Banco de la Provincia was printing paper money equal to 4,000 to 6,000 gold pesos per year without acquiring 4,000 to 6,000 gold pesos for the reserves. This quantity was a very small proportion of the bank's overall assets and liabilities yet it was still an action that an orthodox currency board would not carry out. For the most part, the Banco de la Provincia and the Office of Exchange only exchanged coins and gold for paper money; however, small amounts of unbacked paper money were created over that five-year period. Many books have been written about Argentina's financial history and the existence of currency boards, yet many sources have failed to address the details of the operations of an orthodox currency board. An analysis of this shortcoming is explained in Professor Hanke's (2003) book review of *Straining at the Anchor: The Argentine Currency Board and the Search for Macroeconomic Stability* by della Paolera and Taylor. Hanke explains that the book lacks a thorough explanation of how orthodox currency boards operate and therefore readers are left unclear as to how deviations from orthodox currency boards can cause currency boards to malfunction (Hanke, 2003). This idea can be applied to the note issue of the Banco de la Provincia, which certainly did not act as an orthodox currency board, and thus, malfunctioned in 1872.

Note about statistical information

The sources used for this working paper had little statistical information, but an appendix with a balance sheet of the Banco de la Provincia in 1872 is included.

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