Monetary Policy and Currency Boards

Latin America and Caribbean Countries Examples Vol.1

Steve Hanke
Bilal Kargı
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. Mr. Chairman, thank you for this opportunity to express my views on "Venezuela's Tragic Meltdown." A great deal of the commentary on the topic is polemical, and more-or-less political and ideological self-justifications of one sort or another. In consequence, the discourse is often confused and confusing. In an attempt to bring some clarity to the topic, I will focus on the one necessary condition that must be satisfied before the Venezuelan economy can be turned around. Inflation must be stopped before stability can be established. Stability might not be everything, but everything is nothing without stability.

Ch 2. This chapter describes the methodology and presents the results of a Datincorp survey on Venezuela's economic crisis. The survey was carried out in March 2017. A majority of Venezuelans do not trust the Central Bank of Venezuela, and believe that immediate change is necessary. A majority of Venezuelans also indicate that the implementation of dollarization or an orthodox currency board are not only the most desirable solutions in theory, but are also highly supported by Venezuelan public opinion.

Ch 3. For many reasons, dollarization is an efficient and realistic option for this country. Yet, in order to last, it must be able to withstand banking panics without the assistance of a conventional lender of last resort and the lobby of protected industries to revoke dollarization. To this end, we advance a model of commercial banking close to that of Panama, under foreign law, and argue for free trade agreements with superpowers to smooth out real-exchange rate fluctuations.

Ch 4. We describe the history of Jamaica's Currency Board system, which existed from 1920 to 1961; test how orthodox the currency board was; and compare some features of the currency board and the Jamaican economy during the currency board period to the Bank of Jamaica and to the Jamaican economy under central banking.

Ch 5. The following chapter is an analysis of Chile's pension reform from 1980 to today, in 2019. In this chapter, the authors analyze the structure, implementation, and transition process of the reform, while also highlighting strengths and identifying weaknesses that can be improved upon. This information can be used to assist Chile in its current pension reform, as well as be used as a potential model for future countries looking to overhaul their pension system.

Ch 6. The currencies of Caribbean countries have now outlived their usefulness, and have become a liability. They were devised at a time when most payments were made using notes and coin, issued in distant metropolitan centres. Scarcity of the means of payment was a severe hindrance to commerce. In response currency boards were set up, to issue local currency as needed in the colonies. The system worked well because the local currency issue was backed by an equivalent value of sterling, in a global system of fixed exchange rates. In contrast, nowadays payments are made mostly by electronic communication, credit and debit cards, cheques and drafts, with settlement over digitized bank accounts. In today's world an own currency has become a liability for small economies, limiting access to international goods and services, exposing residents to risks of currency devaluation and inflation, eroding the value of domestic savings, increasing economic inequalities, providing a tool for unproductive government

spending, and diverting attention from the need to increase productivity and enhance international competitiveness.

Ch 7. We provide the first spreadsheet data series and legislative history of note issue by the Commissioners of Currency, in Trinidad, and the Board of Commissioners of Currency, in Barbados. The paper assesses how orthodox the operations of these two currency boards were, analyzing both the legislation and statistics from their balance sheets. The two boards' operations are compared in their structure and level of orthodoxy. There is also some limited discussion of the effects of the boards on the colonies' economies. The chapter makes the various balance sheet data available in machine-readable form for the first time, in a companion spreadsheet workbook.

Ch 8. This chapter seeks to answer whether the replacement of the Bahamas currency board by a central bank was a rational decision given the subsequent economic performance climate of the central bank and the Bahamian economy. The chapter describes the currency board's establishment; its switch from the pound sterling to the U.S. dollar as the anchor currency; and its replacement by a proto-central bank soon succeeded by the Central Bank of the Bahamas, which continues in existence today. Statements of the currency board from the Bahamas Gazette as well as other sources will help analyze the aforementioned periods and illustrate the effects each transition had on the economy. The chapter will examine the later years of the currency board and test whether it behaved in an orthodox or unorthodox manner as well as exploring its relation to government finance.

S. Hanke & B. Kargı
Baltimore & Istanbul
November 15, 2022

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1 Venezuela's tragic meltdown

Steve *Hanke*

Introduction

Venezuela's economy, today, resembles that of the former Soviet Union before it collapsed. Venezuela has the largest proven oil reserves in the world, and not surprisingly produces one major product, oil. Oil production is carried out by a state-owned oil company, Petróleos de Venezuela, S.A. (PDVSA). PDVSA is so poorly run and its proven oil reserves are exploited so slowly as to render the value of its reserves worthless (Hanke, 2017). Venezuela's economy is also burdened by socialist-interventionist structure (Hanke & Yin, 2017). In consequence, economic life is heavily politicized and very uncertain.

Venezuela's economy is collapsing. This is the result of years of socialism, incompetence, and corruption, among other things. An important element that mirrors the economy's collapse is Venezuela's currency, the bolivar. It is not trustworthy. Venezuela's exchange rate regime provides no discipline. It only produces instability and poverty. Currently, Venezuela is experiencing one of the highest inflation rates in the world: 150% per year.

I observed much of Venezuela's economic dysfunction first-hand during the 1995-96 period, when I acted as President Rafael Caldera's adviser (Hanke, 2016). For an excellent analysis of the state of economic dysfunction in Venezuela during the pre-Chavez years, there is no better read than Moises Naim's book: *Paper Tigers & Minotaurs: The Politics of Venezuela's Economic Reforms* (Naim, 1993).

In 1999, Hugo Chavez was installed as president. It was then that the socialist seeds of Venezuela's meltdown started to be planted. As the seeds sprouted, Venezuela began to enter what has become a death spiral. For a most edifying read—one that gives a real feel for the bizarre state of economic affairs in Venezuela—I recommend Raul Gallegos' book: *Crude Nation: How Oil Riches Ruined Venezuela* (Gallegos, 2016).

To put Venezuela on a sound, sustained economic path will require massive economic reforms. Sound economics require sound institutions, even in oil-rich countries (Kaznacheev, 2017). Venezuela, like the former Soviet Union, has none. So, the task ahead will be great. But, as we learned in the communist countries of the former Soviet Union, inflation had to be snuffed out and economic stability established before successful economic reforms could be introduced.

On Venezuela's systemic inflation

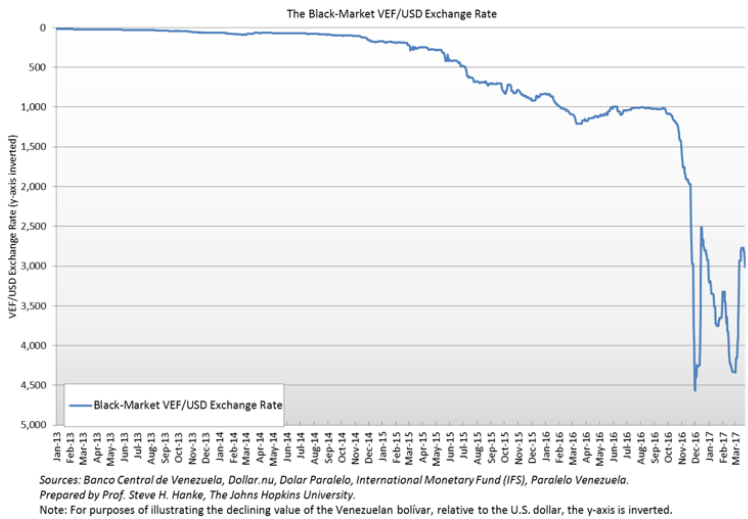
Venezuela suffered from an unstable currency and elevated inflation rates before the arrival of President Hugo Chavez, but with his ascendancy, fiscal and monetary discipline further deteriorated and inflation ratcheted up. By the time President Nicolas Maduro arrived in early 2013, inflation was in triple digits and rising.

With the acceleration of inflation, the Banco Central de Venezuela (BCV) became an unreliable source of inflation data. Indeed, from December 2014 until January 2016, the BCV did not report inflation statistics. To remedy this problem, the Johns Hopkins-Cato Institute Troubled Currencies Project, which I direct, began to measure inflation in 2013.

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 (Hanke & Bushnell, 2016).

Venezuela employs a multiple exchange-rate regime, coupled with exchange controls. 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. 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 plunged, and with that, PPP suggests that Venezuela has experienced a dramatic inflation surge. And it has.



Sources: Banco Central de Venezuela, Dollar.nu, Dolar Paralelo, International Monetary Fund (IFS), Paralelo Venezuela.
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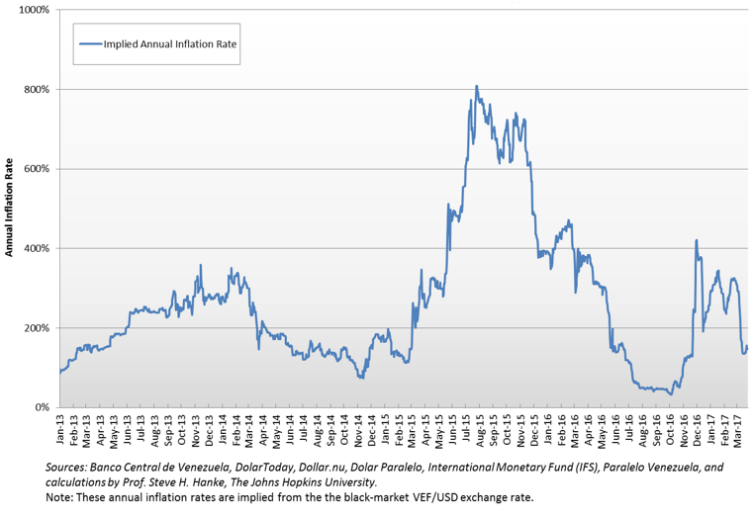
Note: For purposes of illustrating the declining value of the Venezuelan bolívar, relative to the U.S. dollar, the y-axis is inverted.

Figure 1. *The fall in the value of the Venezuelan Bolivar*

We compute the implied annual inflation rate on a daily basis by using PPP to translate changes in the VEF/USD exchange rate into an annua; inflation rate (Hanke & Bushnell, 2016). The chart below shows the course of that annual rate, which peaked at 800% (yr/yr) in the summer of 2015.



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 2. *Venezuela'a annual inflation rates*

It is worth mentioning that a bit later, in December 2016, Venezuela's inflation became the 57th official, verified episode of hyperinflation and was added to the Hanke-Krus *World Hyperinflation Table*, which is contained in the authoritative *Routledge Handbook of Major Events in Economic History* (2013).

An episode of hyperinflation occurs when the monthly inflation rate exceeds 50% for 30 consecutive days. Venezuela's monthly inflation rate exceeded 50% on November 3, 2016 and remained above 50% until December 14, 2016. The peak monthly inflation rate was 221%, which is relatively low in the context of hyperinflations (Hanke & Bushnell, 2016). Venezuela's hyperinflation episode is the 8th to occur in Latin America. Previous episodes in this region are: Argentina (1989), Bolivia (1984), Brazil (1989), Chile (1973), Nicaragua (1986), and Peru (1988 and 1990).

On how to stop inflation and establish stability

There are two proven ways to stop "high" inflations and establish stability. A country can install a currency board system in which its local currency becomes a clone of a reliable anchor currency. Alternatively, a country can abandon its local currency and adopt a reliable foreign currency (read: it can "dollarize"). I designed and implemented both currency board and "dollarized" systems in Latin America, the Baltics, and the Balkans (Hanke, 2016; Santos, 2015). I can attest to the fact that these currency reforms always work to stop inflation in its tracks and establish the stable conditions necessary to carry out economic reforms.

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 equal to 100%, or slightly more, 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 from the difference between the interest it earns on its reserve assets and the expense of maintaining its liabilities (Hanke & Schuler, 2015).

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. In consequence, the quantity of domestic currency in circulation is determined solely by market forces, namely the demand for domestic currency.

Several features of currency boards merit further elaboration. A currency board's balance sheet only contains foreign assets, which are set at a required level (or a tight

range). If domestic assets are on the balance sheet, they are frozen. In consequence, a currency board cannot engage in the sterilization of foreign currency inflows or neutralization of outflows.

A second currency board feature that warrants attention is its inability to issue credit. A currency board cannot act as a lender of last resort or extend credit to the banking system. It also cannot make loans to the fiscal authorities and state-owned enterprises. In consequence, a currency board imposes a hard budget constraint and discipline on the economy.

A currency board requires no preconditions for monetary reform and can be installed rapidly. Government finances, state-owned enterprises, and trade need not be already reformed for a currency board to begin to issue currency.

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

No modern currency board has failed to maintain convertibility at their fixed exchange rate. Indeed, currency boards have an excellent record of maintaining their promised exchange rates, unlike central banks, and this includes Keynes' Russian currency board in Archangel. The so-called British ruble never deviated from its fixed exchange rate with the British pound. The board continued to redeem rubles for pounds in London until 1920, well after the civil war had concluded (Hanke & Schuler, 1991).

It is important to stress, particularly at these hearings, that the currency board idea became engulfed in controversy, thanks to Argentina. What Argentina termed "Convertibility" was introduced in April 1991 to stop inflation, which it did. The system had certain features of a currency board: a fixed exchange rate, full convertibility, and a minimum reserve cover for the peso of 100% of its anchor currency, the U.S. dollar. However, it had two major features which disqualified it from being an orthodox currency board. It had no ceiling on the amount of foreign assets held at the central bank relative to the central bank's monetary liabilities. So, the central bank could

engage in sterilization and neutralization activities, which it did. In addition, it could hold and alter the level of domestic assets on its balance sheet. So, Argentina's monetary authority could engage in discretionary monetary policy, and it did so aggressively.

Because of these flaws, I penned an article which appeared in the Wall Street Journal shortly after the introduction of Convertibility. In that article, I concluded that, unless Argentina adopted orthodoxy and amended the Convertibility law, the system would eventually collapse (Hanke, 1991).

Since Argentina's Convertibility System allowed for both monetary and exchange rate policies, it was not a currency board (Hanke, 2008). Most economists fail to recognize this fact. Indeed, a scholarly survey of 100 leading economists who commented on the Convertibility System found that almost 97% incorrectly identified it as a currency board system (Schuler, 2005). In short, those that use the collapse of Argentina's Convertibility System to argue against currency boards are using a bogus argument. Indeed, they literally don't know what they are talking about.

The second proven alternative to stop "high" inflations and establish stability is "dollarization". It occurs when residents of a country use a foreign currency instead of the country's domestic currency. The term "dollarization" is used generically and covers all cases in which a foreign currency is used by local residents. Even though other foreign currencies, such as the euro and Swiss franc, are sometimes used instead of local currencies, it is the U.S. dollar that dominates. Hence, the use of the term "dollarization." At present, 33 countries are dollarized.

Countries that are officially dollarized produce lower, less variable inflation rates and higher, more stable economic growth rates than comparable countries with central banks that issue domestic currencies. Dollarization is, therefore, desirable. The accompanying chart shows the normalized values of real GDP in terms of U.S. dollars between 2001 (index value = 100) and 2016 for nine Latin American countries. Three – Panama, Ecuador, and El Salvador – are officially dollarized, while Peru is semiofficially dollarized. In the three officially

dollarized countries, real GDP growth has been more stable and generally superior to growth in the countries that issue their own domestic currencies. While Peru's growth has only been surpassed by Panama's, it is less stable than growth in the three officially dollarized countries. The sharp changes in terms of trade, which were associated with the commodity cycle, affected the volatility of real GDP measured in U.S. dollar terms much more in the countries that issued their own domestic currencies than it did in those that were officially dollarized.

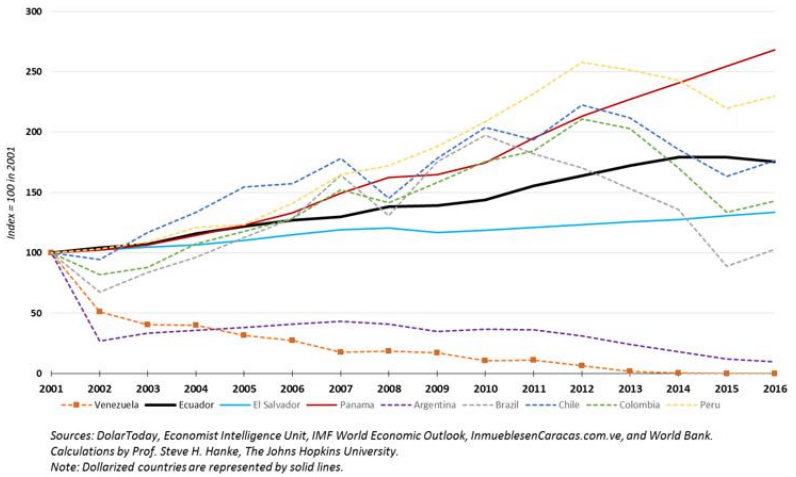


Figure 3. *Dollarized vs. Undollarized Latin American Countries: Real GDP in USD at current prices (2001-2016)*

A US policy response to Venezuela's meltdown?

The meltdown of Venezuela's economy is tragic and of Venezuela's own making. What to do? The U.S. government should avoid meddling directly in Venezuela's affairs. Forget the regime change mantra that has long been popular in certain circles within Washington, D.C. Proactive U.S. regime change policies have a long record of ending badly (Kinzer, 2013; Hanke & Hanke, 2011).

So, should the U.S. adopt a "do nothing" policy towards Venezuela? No. The U.S. has international obligations. For example, the U.S. is a member of the Organisation of American States and the United Nations. These organizations, and others, provide an avenue for the U.S. to be engaged in the Venezuelan meltdown.

In addition, specific actions to address Venezuela's immediate inflation problem can be taken. These actions could encourage either the establishment of a currency board system or the adoption of dollarization. For example, in 1992, I worked with the leader of the U.S. Senate, Bob Dole, and Senators Steve Symms and Phil Gramm to draft U.S. legislation that would allow countries to use part of the U.S.'s quota contribution to the IMF for the establishment of currency boards. This legislation, (HR-5368, Law no. 102-391), was signed into law on October 6, 1992.

As for dollarization, it also has a U.S.-friendly history. For example, Senator Connie Mack worked tirelessly to promote dollarization and sound-money policies when he chaired the Joint Economic Committee of Congress (Schuler, 2000; Schuler & Stein, 2000).

It is gestures such as these that will provide the political opposition the courage to propose the only proven solutions to Venezuela's inflation problem—solutions that would immediately stop Venezuela's meltdown. It is encouraging that a recent survey in Venezuela concluded that the public supports both currency boards (59% approve) and dollarization (62% approve). Even a large portion of those who support the current government don't support the central bank (50%) and want change, with 43% favoring a currency board and 31% favoring dollarization (DatinCorp, 2017).

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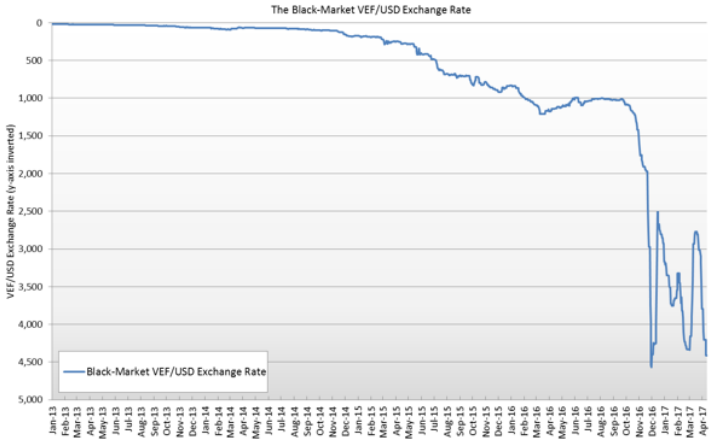
2 A survey of Venezuelan public opinion on the replacement of the Bolivar with either the U.S. dollar or the central bank of Venezuela with a currency board

Steve H. ***Hanke*** & María Belén ***Wu***

Introduction

With the arrival of President Hugo Chávez in 1999, Venezuela embraced Chavismo, a form of Andean socialism. In 2013, Chávez met the Grim Reaper, and Nicolás Maduro assumed Chávez's mantle.

The Grim Reaper has also taken its scythe to the Venezuelan bolivar. The death of the bolivar is depicted in the following chart. A bolivar is worthless.



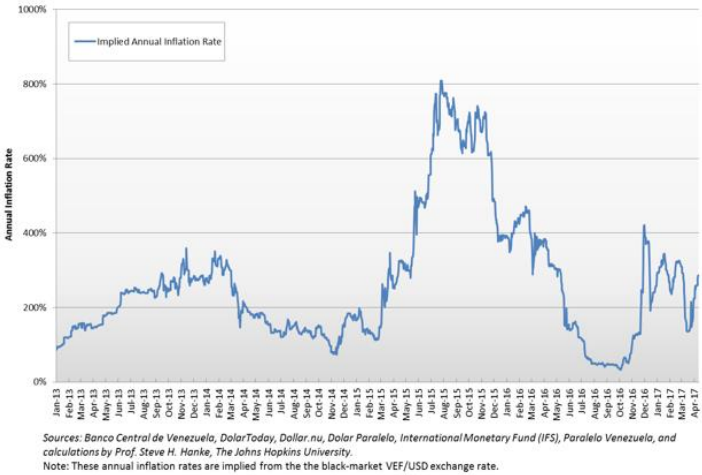
Sources: Banco Central de Venezuela, Dollar.nu, Dolar Paralelo, International Monetary Fund (IFS), Paralelo Venezuela.
Prepared by Prof. Steve H. Hanke, The Johns Hopkins University.
Note: For purposes of illustrating the declining value of the Venezuelan bolivar, relative to the U.S. dollar, the y-axis is inverted.

Figure 1. *The fall in the value of the Venezuelan Bolivar*

With the collapse of a currency comes inflation. By the time President Nicolás Maduro arrived, inflation was in triple digits and rising.

As inflation accelerated, the Banco Central de Venezuela (BCV) became an unreliable source of inflation data. Indeed, from December 2014 until January 2016, the BCV did not report inflation statistics. To remedy this problem, the Johns Hopkins-Cato Institute Troubled Currencies Project, which I direct, began to measure inflation in 2013.

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 black market data are available, changes in the black market exchange rate can be reliably transformed into accurate estimates of countrywide inflation rates. Using the economic principle of Purchasing Power Parity (PPP), I compute the implied annual inflation rate each day by translating changes in the VEF/USD exchange rate into annual inflation rates. The chart below shows the course of that annual rate, which peaked at 800% (yr/yr) in the summer of 2015. As of April 30, 2016, Venezuela's annual inflation rate is 280%, one of the highest inflation rates in the world (see the chart below).



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 2. *Venezuela's annual inflation rates*

Historically, policymakers have attempted to tackle the question of how to stop inflation, especially hyperinflation, with little to no success. Inflation is inherently destabilizing for not only a country's economy, but as Venezuela's case demonstrates, it incites endless social and political unrest. Stability might not be everything, but everything is nothing without stability. So, what steps can be taken to restore economic stability in Venezuela?

Dollarization

One sure-fire way to stop Venezuela's death spiral is to dump the bolivar and adopt the greenback. This is called "dollarization." It is a proven elixir. I (Hanke) know because I operated as a State Counselor in Montenegro when it dumped the worthless Yugoslav dinar in 1999 and replaced it with the Deutsche mark. I also watched the successful dollarization of Ecuador in 2001, when I was operating as an adviser to the Minister of Economy and Finance.

Officially dollarized countries produce lower, less variable inflation rates and higher, more stable economic growth rates than comparable countries with central banks that issue domestic currencies. Dollarization is, therefore, desirable. The

chart below shows the normalized values of real GDP in terms of U.S. dollars between 2001 (index value = 100) and 2016 for nine Latin American countries. Three – Panama, Ecuador, and El Salvador – are officially dollarized, while Peru is semi-officially dollarized (read: both the Peruvian sol and USD are legal tender). In the three officially dollarized countries, real GDP growth has been more stable than and generally superior to growth in the countries that issue their own domestic currencies.

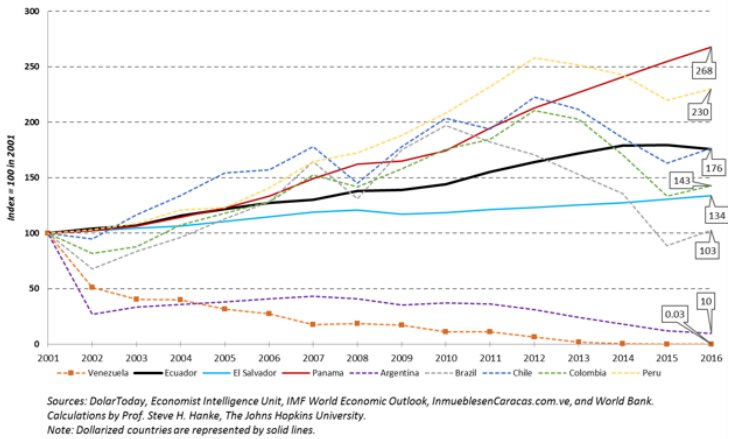


Figure 3. *Dollarized vs. undollarized Latin America countries: Real GDP in USD at current prices (2001-2016)*

So, not all the news from Venezuela is grim. After all, there is a tried and true way to stabilize the economy, which is a necessary condition required before the massive task of life-giving reforms can begin. Dollarization would stabilize the economy, but it is not the only solution.

Currency board

A second sure-fire method to stop Venezuela's death spiral would be to adopt a currency board system. In such a system, the bolivar would become a clone of a reliable anchor currency, such as the U.S. dollar.

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. The reserve levels (both floors and ceilings) are set by law and are equal to 100%, or slightly more, of its monetary liabilities. A currency board generates profits from the difference between the interest it earns on its reserve assets and the expense of maintaining its liabilities.

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A currency board cannot issue credit. It cannot act as a lender of last resort or extend credit to the banking system. It also cannot make loans to the fiscal authorities and state-owned enterprises. In consequence, a currency board imposes a hard budget constraint and discipline on the economy.

A currency board requires no preconditions for monetary reform and can be installed rapidly. Government finances, state-owned enterprises, and trade need not be already reformed for a currency board to begin to issue currency.

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

It is important to mention that, because of Argentina, the currency board idea became engulfed in controversy. What Argentina termed "Convertibility" was introduced in April 1991 to stop inflation, which it did. The system had certain features of a currency board: a fixed exchange rate, full convertibility, and a minimum reserve cover for the peso of 100% of its anchor currency, the U.S. dollar. However, it had two major features which disqualified it from being an orthodox currency board. It had no ceiling on the amount of foreign assets held at the central bank relative to the central bank's monetary liabilities. So, the central bank could engage in sterilization and neutralization activities, which it did. In addition, it could hold

and alter the level of domestic assets on its balance sheet. So, Argentina's monetary authority could engage in discretionary monetary policy, and it did so aggressively.

Because of these flaws, I penned an article which appeared in the October 25, 1991 edition of the *Wall Street Journal*. I concluded that, unless Argentina embraced orthodoxy and amended the Convertibility Law, the system would eventually collapse, which it did in 2002.

The collapse of Convertibility spawned a cottage industry of currency board critiques. But, since Argentina's Convertibility System allowed for both monetary and exchange rate policies, it was not a currency board – something most economists fail to recognize. Indeed, a scholarly survey of almost 100 leading economists who commented on the Convertibility System found that almost 97% incorrectly identified it as a currency board system. So, those that used the collapse of Argentina's Convertibility System to argue against currency boards literally didn't know what they were talking about.

On the importance of public opinion

Many great thinkers have realized the importance of public opinion. For example, Voltaire won his famous Calas case by winning over the "court of public opinion." And it was Voltaire who concluded that the Crusades and the use of Islam (read: religious prejudice and intolerance) were the result of the changing winds of public opinion.

Ludwig von Mises, in his treatise, *Human Action*, had this to say about public opinion:

But it is different in the field of social organization and economic policies. Here the best theories are useless if not supported by a majority of the people. They cannot work if not accepted by a majority of the people. Whatever the system of government may be, there cannot be any question of ruling a nation lastingly on the ground of doctrines at variance with public opinion. In the end the philosophy of the majority prevails. In the long run there cannot be any such thing as an unpopular system of government. The difference between democracy and despotism does not affect the final outcome. It

refers only to the method by which the adjustment of the system of government to the ideology held by public opinion is brought about. Unpopular autocrats can only be dethroned by revolutionary upheavals, while unpopular democratic rulers are peacefully ousted in the next election.

The supremacy of public opinion determines not only the singular role that economics occupies in the complex of thought and knowledge. It determines the whole process of human history.

The customary discussions concerning the role the individual plays in history miss the point. Everything that is thought, done and accomplished is a performance of individuals. New ideas and innovations are always an achievement of uncommon men. But these great men cannot succeed in adjusting social conditions to their plans if they do not convince public opinion (pp.863-864).

Thus, we turn to Datincorp's new survey to understand public opinion in Venezuela under the Socialist 'stewardship' of Maduro.

The survey

a. Objective and Methodology

The general objective of the Datincorp Survey was to obtain a reliable diagnosis of Currency and Country Expectations of the Bolivarian Republic of Venezuela, disaggregated by demographic indicators.

The methodology of the study comprised the following stages:

1. Preparatory Stage: Decisions were made regarding the construct that was measured, its definition and form of measurement, as well as the development and revision of the constructed reagents.
2. Design Stage: At this stage the sample and the field work were designed. The instrument was validated before its application with a pilot sample in the field.
3. Fieldwork Stage: At this stage the instrument was used within the conditions in which it was constructed. The instrument was applied to pre-selected interviewees directly in

their homes, according to procedures established in the methodology.

4. Results Analysis Stage: Once the field data was collected, it was reviewed and transcribed into the database, yielding the results. Statistical analysis was then generated.

5. Logical Analysis Stage: This is the final phase of the study. Logical analysis is the logical and flat interpretation of the results of the research.

The study's universe consisted of all the electors of the Bolivarian Republic of Venezuela, older than 18 years of age, living in Venezuela. The geographic coverage of the study comprised the major urban domains and some smaller urban domains of the mentioned political-administrative areas.

Study Sample Design:

1. The sample was designed under the four-stage probabilistic method (starting with the selection of urban areas, then the selection of blocks and streets, the selection of the dwellings, and finally the selection of the interviewees), taking into account the disaggregation proposed in the coverage.

2. Sample size: The overall "n" and final size of the sample was 1,200 voters interviewed, with a maximum expected sample error of (+/-) 2.8%, and with a confidence level of 95%.

3. Sample framework: The sample frame of the study is formed by the number of voters that exists in the geographic area under study.

Field Strategy:

- The persons preselected strictly in their homes were interviewed, classifying them by Type of Housing, Age and Sex.
- Supervision was 100% in the field.

Results Analysis:

- Revision: All of the fieldwork was carefully supervised, and each one of the questionnaires meticulously revised, to guarantee the quality of the data.
- Processing: The answers of the interviewees were transcribed to a database that was processed by an electronic statistical package, which permitted the analysis of the voters' opinions.

- Statistical Analysis: Once all the data was transcribed, results were statistically analyzed according to the total number of voters in Venezuela and the information was disaggregated by demographics, crosses of variables by political party, and any other variable required by the client and their advisors.

b. Results of the Survey

The original Spanish survey questions as well as their English translation are included in the Appendix.

The following charts describe the major findings of the survey. These are broken down by political view (Chavista or opposition). The first two charts represent the respondents' views on the potential dollarization or installation of a currency board in Venezuela.

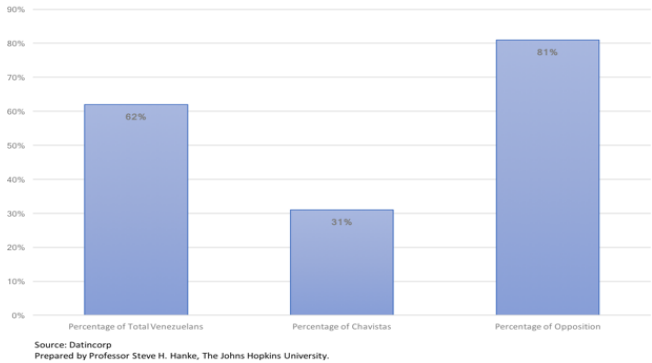

Figure 4. *Those favoring dollarization*

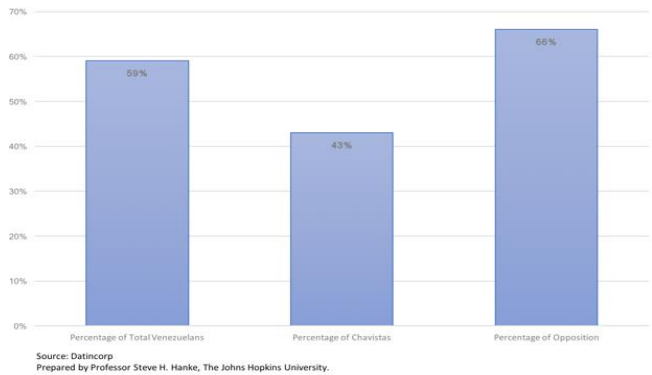

Figure 5. *Those favoring a currency board*

As shown in the charts above, the study revealed that 62% of Venezuelans are in favor of a dollarized economy. From the total number of respondents, 31% of Chavistas and 81% of the opposition are in favor. Similarly, 59% of Venezuelans are in favor of installing an orthodox currency board in Venezuela. From the total number of respondents, 43% of Chavistas and 66% of the opposition are in favor.

Additionally, the survey also revealed that out of the mere 21% who believe the Central Bank of Venezuela is helping the Venezuelan economy, only 50% of Chavistas and 8% of the opposition believe that the Central Bank of Venezuela is doing a good job at maintaining the purchasing power of the bolivar.

The charts below show the percentage of Venezuelans that believe inflation in 2017 will be higher than in past years, as well as Venezuelans' opinions on whether the general social, economic, and political climate will worsen or improve in the next months to years in Venezuela.

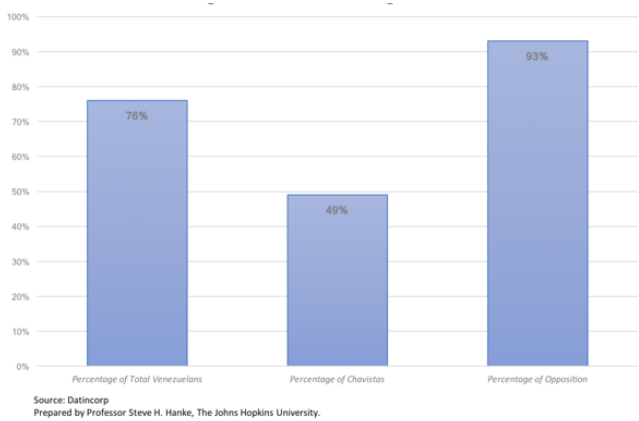

Figure 6. *Those believing inflation in 2017 will be higher than in past years*

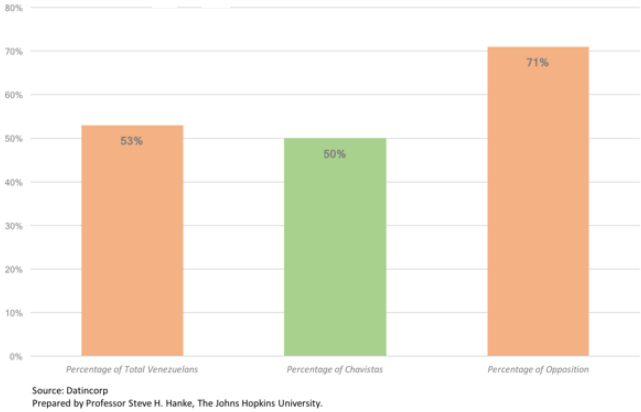

Figure 7. *Those who believe that the general social, economic, and political climate will worsen (orange) or improve (green) in the next months to years in Venezuela*

The answers to the survey are striking. While the Chavistas distrust the Central Bank, they are unwilling to put the bolivar to death. In consequence, they favor the replacement of the Central Bank with a currency board system, rather than dollarization (43% vs. 31%). At the same time, the study found that 67% of Chavistas claim they would like to continue using bolivars for their daily transactions in the near future. In fact, 49% of Chavistas think that the bolivar should have the same value as the dollar – and yet they reject dollarization.

Furthermore, it is noteworthy that a significant portion of interviewees answered "don't know/don't have an opinion" in the question regarding potential dollarization or a currency board. Hence, it is relevant and necessary to educate the Venezuelan public on these two alternative monetary systems and their benefits. For this purpose, we have created a table, which is attached as a concluding Annex. It summarizes the benefits of dollarization in orthodox currency boards.

Lastly, the study found that 65% of Venezuelans do not convert prices from bolivars to dollars when buying goods. This was an unexpected result, as we would have expected the answer to be majority "yes", due to the predominance of the black market as a gateway to obtain scarce goods.

Conclusion

The big takeaways from the Datincorp survey are: 79% of Venezuelans do not trust the Central Bank of Venezuela, 62% favor abandoning the bolivar and replacing it with the U.S. dollar, and 59% support doing away with the Central Bank, replacing it with a currency board. Public opinion firmly supports a major change in Venezuela's currency regime.

Appendix

Survey Questions – English Version

VARIABLE: THE CURRENCY BOARD OR DOLLARIZATION OF THE VENEZUELAN ECONOMY

1. In what currency would you prefer to receive your income?
   a. Bolivars
   b. Dollars
   c. Another currency
   d. Don't know/Don't have an opinion
2. Currently, what currency do you use most frequently for daily transactions?
   a. Bolivars
   b. Dollars
   c. Other
3. Currently, in what currency do you hold savings, if applicable?
   a. Bolivars
   b. Dollars
   c. Other
4. One year ago, what currency did you use most frequently for daily transactions?
   a. Bolivars
   b. Dollars
   c. Other
5. One year ago, in what currency did you hold savings, if applicable?
   a. Bolivars
   b. Dollars
   c. Other
6. In the near future, what currency do you expect to use most frequently for daily transactions?
   a. Bolivars
   b. Dollars
   c. Other
7. In the near future, in what currency do you expect to hold savings, if applicable?
   a. Bolivars
   b. Dollars
   c. Other
8. If you had the economic and financial ability to save, what would you choose to do?
   a. You would spend all your money on anything
   b. You would buy real estate
   c. You would buy a car
   d. You would save in bolivars
   e. You would buy dollars
   f. You would buy gold
   g. Other option. Which one? _____

h. Don't know/Don't have an opinion

9. Would you support a government decision to discontinue bolivars and introduce new banknotes guaranteed to have the same value as the dollar?
   a. Yes
   b. No
   c. Don't know/Don't have an opinion
10. Would you support a government decision in which they turn the dollar into Venezuela's national currency?
   a. Yes
   b. No
   c. Don't know/Don't have an opinion
11. Do you trust the Central Bank of Venezuela to maintain the purchasing power of bolivars?
   a. Yes
   b. No
   c. Don't know/Don't have an opinion
12. Today, when you are buying things, do you tend to convert from the price in bolivars to dollars when it concerns:
   a. Yes, for common purchases such as day-to-day shopping
   b. Yes, for exceptional purchases such as the purchase of a car or a house
   c. No, not at all
   d. It depends (spontaneous)
   e. You don't remember the value of the previous currency (spontaneous)
   f. Don't know
13. What is your expectation regarding the inflation rate this year? Compared to last year, will it be:
   a. Higher
   b. Lower
   c. The same
   d. Don't know

I. Survey Questions – Spanish Version

VARIABLE: LA CAJA DE CONVERSIÓN O LA DOLARIZACIÓN DE LA ECONOMÍA VENEZOLANA

1. ¿En qué moneda prefiere recibir sus ingresos? ¿En bolívares o en dólares?
   a. Bolívares
   b. Dólares
   c. Otra moneda (No mencionar)
   d. No sabe / No opina (No mencionar)

2. Hoy en día, qué moneda utiliza usted más frecuentemente para realizar transacciones diarias?

a. Bolívares
b. Dólares
c. Otra moneda

3. Hoy en día, en qué moneda conserva sus ahorros? (Si es aplicable)
a. Bolívares
b. Dólares
c. Otra moneda (No mencionar)
d. No sabe / No opina (No mencionar)

4. Hace un año, qué moneda solía utilizar usted más frecuentemente para realizar transacciones diarias?
a. Bolívares
b. Dólares
c. Otra moneda

5. Hace un año, en qué moneda solía conservar sus ahorros? (Si es aplicable)
a. Bolívares
b. Dólares
c. Otra moneda

6. En el futuro cercano, qué moneda espera utilizar usted más frecuentemente para realizar transacciones diarias?
a. Bolívares
b. Dólares
c. Otra moneda

7. En el futuro cercano, en qué moneda espera conservar sus ahorros? (Si es aplicable)
a. Bolívares
b. Dólares
c. Otra moneda

8. En caso que usted tuviese posibilidades económicas y financieras para ahorrar ¿qué escogería hacer?
a. Se gastaría todo el dinero en lo que sea
b. Compraría propiedades inmobiliarias
c. Compraría un carro
d. Lo ahorraría en bolívares
e. Compraría dólares
f. Compraría oro
g. Otra opción ¿Cuál? _____
h. No sabe / No opina (No mencionar)

9. ¿Apoyaría una decisión del gobierno que reemplace el bolivar por una nueva moneda que tenga garantizado el mismo valor que el dólar?
a. Sí
b. No
c. No sabe / No opina (No mencionar)

10. ¿Apoyaría una decisión del gobierno que convierta al dólar en la moneda nacional de Venezuela?
a. Sí
b. No

c. No sabe / No opina (No mencionar)

11. ¿Confía usted en el Banco Central de Venezuela para mantener el poder de adquisición del bolívar?

a. Sí
b. No
c. No sabe / No opina (No mencionar)

12. ¿Hoy en día, cuando usted va de compras, tiende a convertir el precio en bolívares al precio en dólares cuando se trata de…?

a. Sí, para compras comunes como ir al supermercado
b. Sí, para compras excepcionales como la compra de un automóvil o una casa
c. No, en ninguna circunstancia
d. Depende
e. Usted no conoce el valor en dólares
f. No sabe

13. ¿Cuál es su expectativa para a la tasa de inflación del 2017? Comparado al año pasado, usted espera que sea…

a. Más alta
b. Más baja
c. La misma tasa obtenida en 2016
d. No sabe

3 A plan for dollarizing Argentina

Jorge C. ***Avila***

Introduction

The history of Argentina's monetary and macroeconomic instability is long and known by all; its efficiency cost defies imagination (Ávila, 2011). Instability was high in 1975 (fiscal and balance-of-payments crisis), higher in 1989/90 (hyperinflation), and even higher in 2001/02 (banking panic and debt default). The sharp run from Central Bank peso notes towards the dollar in 2018 is a piece of evidence that Argentina keeps being a de-facto dollarized country.

In the 70s anti-inflationary policies hinged on fixing the foreign-exchange rate through administrative decisions taken by the Minister of Finance. In the face of growing loss of credibility, in the 80s anti-inflationary policies started to demand explicit backing of the President of the Nation. In the 90s Convertibility required passing a law by Congress. Nowadays a credible peso fixing would require dollarizing the country. Dollarization is defined as the unilateral substitution of reserve money (US dollar, Euro) for the national currency.

This is an odd country. On the one hand, it works under a currency substitution system;[1] on the other, its economy is ruled by the country-risk premium. Its Central Bank cannot issue reserve money and its Government cannot issue bonds AAA. So it does not have the necessary tools to carry counter-cyclical fiscal and monetary policies out. Argentina lacks credit in the broadest sense; it is a zero-trust country.

Dollarization has become a real alternative because it is basically irreversible, because the cost of seigniorage is only a fraction of the benefit the country forgoes by keeping the peso, because an independent monetary policy does not have influence upon the real exchange rate and the business cycle, and because the inflation tax has been for a long time the basic source of financing of an expansive fiscal policy.

A lasting dollarization should rest on two reforms: a) a new commercial banking system because from experience we think a dollarized Argentina would not support a six-month bank run; b) free trade agreements with superpowers because from experience we think a dollarized Argentina would not last ten years the complaints for losses of competitiveness coming from the protected industry.

Section 2 introduces a plan for a lasting dollarization, which comprises four stages: conversion, dollarization, commercial banking reform, and trade liberalization anchored in free-trade agreements with superpowers. We emphasize at every step the need of irrevocable monetary, banking, and commercial arrangements. Section 3 attempts to answer various questions and criticisms to the plan. Section 4 focuses on the design of a model of commercial banking strong enough to keep the value of deposits safe. And Section 5 summarizes the main remarks.

The plan

Back in 1960 former finance minister Federico Pinedo published a little book evaluating the performance of the Argentine economy in the preceding 150 years. Among other

[1] For us a system of currency substitution is the same as a dollarized system or a bimonetary system (peso/dollar). For the sake of simplicity, we will refer to the Argentine system as a bimonetary one from now on.

remarks, he stressed the fact that the country had been especially prone to fiscal deficits and inflation. After adding the fiscal and monetary chaos of the following six decades to the picture, it is easy to realize that Pinedo had not seen anything yet.

The very existence of a central bank leads to devaluation of the currency and inflation. It's hard to reject this statement born of Argentine own economic history. Instead of new attempts to make the peso come back to life, we should do otherwise: substitute a World class currency for the peso. This amounts to dollarizing the economy through the unilateral adoption of the US dollar or the euro as this country's legal currency.

Dollarization so defined has benefits and problems. The former are huge and the latter, important. Among the problems, it's usually said, dollarization carries political costs so great that efforts to that end are hopeless. I don't know. People in Ecuador, El Salvador and Panama do not think so. Not either in Scotland, where they discuss the possibility of staying with the EU and keeping the pound sterling while the UK leaves the Union. This would also be another example of dollarization.

Thanks to a first class currency Argentina would enjoy these benefits: no more currency devaluations or inflation; no more traumatic hot-money inflows or outflows; no more recurrent wage bargaining or labor strikes; no more power-tariff hikes or blackouts; no more price freezes or threats of expropriation, and no more embargoes on exports or imports. Although it's hard to believe, each of these shocking events has to some extent a monetary cause. So big and ignored are the damages that a poor quality currency like the peso can inflict on the national economy.

A lasting dollarization process covers from the short to the long run. We identify four main stages.

First stage: Conversion of monetary and non-monetary liabilities of the Central Bank. The former are the monetary base and the latter, the interest-bearing peso notes issued by the Central Bank. The conversion exchange rate equals the quotient of liabilities and international reserves. Investors

make this calculation daily since the early 1980s. The conversion exchange rate would be lower if a) excluding part of the stock of peso notes was not risky for monetary stability, or b) increasing the stock of international reserves without compromising the public-debt service was possible. With full conversion of the Central Bank's monetary and non-monetary liabilities, the peso short-run interest rate would fall to the level of the three-month American-bond rate, plus the expected rate of devaluation of the peso with respect to the dollar, the Central Bank may choose not to roll over its non-monetary liabilities, and no foreign-exchange crisis should occur. Thus the inflation rate would start to decline till vanishing in three-year time more or less.

Second stage: But in order to build the Argentine economy edifice we need a fixed price of the dollar for the indefinite future. Two conditions: fixed price and indefinite future. Conversion provides a fixed price. But since the demise of Convertibility Law in 2002 this regime lacks the essential credibility to provide time perspective. The answer is dollarization due its irreversibility. We talk about irreversibility in probabilistic terms since the likelihood of de-dollarization is quite low. Expected devaluation would then vanish and the short-run peso interest rate would fall to the level of the three-month American-bond interest rate.

Passing from Conversion to dollarization should take no more than six months since the latter gives a time horizon to the former. In this time span Government would convert banking deposits and Central Bank notes into dollars at the Conversion exchange rate, and offer the public the conversion of their currency holdings at the same exchange rate, while proceeding to import the needed quantities of coins and small-denomination bills.

Third stage: An ordinary dollarization is a ticket to a banking panic. There exists certain relationship between a fixed exchange policy (of which dollarization is an extreme type) and banking panics since dollarization leaves commercial banking without a last resort lender. This is the first problem we have to solve in order to get a durable dollarization. Without solving it, the interest rate on the ten-year dollar

denominated Argentine bond would not fall and the dollarization attempt would be a failure. Be aware of the fact that this rate governs spending in the national jurisdiction (Ávila, 2010).

The Federal Reserve System is not the last resort lender in Ecuador, El Salvador, and Panama. To solve the problem the first two countries established high reserve ratios on deposits and asked commercial banks to create liquidity funds; so far, they have been successful. The task of the Central Banks in these countries is a modest one; it consists of coordinating and supervising the activities of commercial banks. If Scotland decided to maintain the pound sterling without a previous agreement with the Bank of England, it would follow the same path. In turn, Panama put in practice in 1970 a banking model highly integrated with international capital markets. It works successfully under national law, without reserve requirements or liquidity funds. But in view of the long history of contractual violations and institutional reversion, such solutions do not seem appropriate for a country like Argentina. In the middle of a financial crisis, the probability that the government of this country arbitrarily puts bonds on bank reserves and liquidity funds, or repudiate national law, is really high.

There are other ways to make up for the last resort lender. Let's consider two of them. The Simons proposal: consists of dividing commercial banks in two parts; a monetary store that takes in current account deposits under 100% reserve ratio and offers liquidity services, and an investment bank that, instead of taking in time deposits, issues security shares and invests in assets the value of which fluctuates in the Stock Exchange. In this fashion the proposal eliminates the perverse asymmetry affecting the nominal values of assets and liabilities of traditional banking, and affords a stable system without the help of a lender of last resort. This is not however a wise solution. Since the monetary store would work under Argentine jurisdiction the probability that Government put forcefully a bond on its reserves is really high (Ávila, 2004).

The next proposal is risk-free. There's no chance that Government arbitrarily puts bonds on banks reserves and there's no chance that a banking panic could happen. Think of

an internationalized system of commercial banks. Resident banks would continue to offer traditional capital-market services though they will not receive deposits or give loans on their own but on account of prestigious foreign banks. Deposits and loans would remain under the jurisdiction of the Central Banks to which the foreign banks report. So those central banks would become lenders of last resort of resident commercial banking under foreign law. Since the cost of repudiating of an arrangement under foreign law is bigger than that of repudiating an arrangement under national law, this banking organization would have a better chance to live on and help to lower country risk (Ávila, 2004).

This problem demands decisive action. The second and third stages should be treated as one.

Fourth stage: We have to face a couple of additional problems in order to build a lasting dollarization. The first one relates to likely difficulties to place new sovereign debt, and the second to claims for so called losses of competitiveness.

For a country without an issuing bank it might be more difficult to place sovereign debt. The bond holder may feel more exposed to default risks and ask for higher yields when he knows Government cannot print money. There are a couple of tools to address this situation: a) external contingent credit; b) fiscal surplus. To the best of our knowledge, there is not a good solution for this problem because there is not an arrangement with low probability of reversal.

If the absence of a lender of last resort can be fatal in the short run, the claims for losses of competitiveness of the protected industry can be corrosive in the long run. A durable dollarization will lower significantly the long-run interest rate and bring abundant credit while the country gets more expensive. We have two powerful tools to counteract this phenomenon: a) open up the economy, that is to say raise exports and imports as a fraction of GDP; b) reduce the size of Government, that is to say lower public spending as a fraction of GDP.

We think there is no way to effectively open the economy up without turning to free-trade agreements with superpowers. Trade liberalization generates a new relative-price structure. In

particular, it raises the price of export goods thus fostering a reallocation of capital, labor and entrepreneurial capacity from the protected sector to the unprotected one, and meanwhile creates an attractive environment for foreign direct investment. But if entrepreneurs and investors perceived the new price structure as temporary, the economy would get bogged down in the mud. Because of the expected policy reversal, protected industry stagnates, unemployment rises, investment is delayed, and exports languish. Signing free-trade agreements with superpowers is an efficient escape from this situation due to their low probability of repudiation. If the trade liberalization policy could not be anchored in this manner, the best thing is not to open the economy at all. In view of the high probability that the Argentine government will be the first to request an exception to the rule, the economy would get bogged down and the agreements would fall in public disrepute (Ávila, 2015: chap. II).

Let us explain how the forces unleashed by the opening up lead to a cheapening of the country, a so called competitive gain. As we know, the capital-account balance must be equal to the current-account balance with opposite sign. Assume no net capital inflows so that the current-account balance is zero. The opening up takes place. Thus the price of imported goods goes down while import spending goes up. But the current-account balance must always be zero. So exports grow proportionally. Exports grow because the price of services (non-traded goods) goes down. That is to say the country gets cheaper. This phenomenon makes stronger the rise of the relative price of exportable production aforementioned.

Reducing the size of Government makes cheaper the country in a direct way. Given that public spending is composed mainly of wages (teachers, policemen) and public works, its reduction implies a contracted demand for services in general, and an additional cheapening. Labor deregulation, infrastructure investment and removing distorting taxes are important reforms. But when public spending increases too much and the economy is rather closed to international trade their influence become nil.

As investors check progress in the third and four stages, the Argentine risk premium will move downwards to the Chilean risk premium. A steady process of direct foreign investment, export expansion, and economic growth will follow the reduction of Argentine risk. Concrete outcomes will take time, no less than three or four presidential terms.

The first stage has no purpose without the second. The second stage without the third is dangerous. And the third stage without the fourth is naïve, and ill-fated for the ideal of a fully integrated country to World trade and capital markets.

This is our economic argument for dollarizing Argentina. Now politicians should weigh pros and cons.

The ABC of lasting dollarization

The purpose of this section is to answer or comment various questions and criticisms to our Plan. Some passages repeat arguments developed before for the benefit of clarity.

1. What do we mean by dollarization?

It's the unilateral adoption of a reserve currency. In practice, only two currencies enter this category: the US dollar and the euro.

2. Are there many dollarized countries?

There are many de-facto dollarized countries. Think of countries whose dollar-monetary assets represent a large fraction of total monetary assets. In 2000, after a long decade of monetary stability, Argentina ranked 4th in a list of dollarized countries, below Bolivia, Nicaragua, and Russia (Ávila, 2004). Nevertheless, when talking about dollarization we usually think of de-jure, full or official dollarization. There were 35 officially dollarized countries in 2002. Ecuador, Panama, and El Salvador stand out when measured in terms of GDP. Ecuador's GDP represents 20% of the Argentine GDP; Panama's 10%, and El Salvador's 5%.[2] Kosovo's and Montenegro's GDP are smaller, and they opted for the euro. The remaining countries are micro-states (Hanke, 2002; Jácome & Lönnberg, 2009).

3. What reasons led them to be dollarized?

[2] Own estimates based on International Financial Statistics 2016.

Panama got dollarized due to a historical accident. El Salvador, to lower interest rates, spur foreign direct investment and also because it was the next logical step in its program of economic reform. After leaving old Yugoslavia, Kosovo and Montenegro adopted the German mark because it was a better currency than the dinar, and as soon as Germany substituted the euro for the German mark they did the same. Finally, Ecuador got dollarized due to a banking crisis and after a bout of high inflation (almost 100% per year). None of these countries needed a megacrisis like those affecting Argentina since the Rodrigazo, in 1975, to be dollarized.

4. Why should Argentina be dollarized?

Because Argentina has attempted unsuccessfully to survive with de-facto dollarization for the last 35 years. The volatility of velocity of circulation is a salient feature of a de-facto dollarized, bimonetary economy. This means that portfolio changes from national money to reserve money, whatever the motive, could be sudden, frequent, and massive, implying a well-known row of maxi-devaluations, inflation hikes, capital outflows, and recession (Ávila, 2004). For this reason we claim that a policy of floating-exchange rate is a dangerous thing for this country.

To deal with a bimonetary economy the exchange rate must be fixed. Convertibility did so. Yet this regime has a flaw: it can be revoked without paying a significant cost. Conversely, dollarization faces a high cost of repudiation which makes dedollarization unlikely. There are no examples of reversals of official dollarizations. Liberia, at the end of WWII, might be an exception but we lack enough information to make sure.

5. Which are the benefits of dollarization?

The benefits are the misfortunes the country will avoid: foreign-exchange runs, inflation and hot-money flows; recurrent wage bargaining and strikes, power-tariff hikes and blackouts, price freezes and expropriation threats, export and import embargoes. To some extent, all this damage is the consequence of a low quality currency.

Another benefit is the instantaneous fall of the short-run interest rate (3 to 6 months). The fall of the long-run interest rate is another story. This one depends on the country risk

premium, which, in turn, depends on issues like the fiscal deficit, the ratio of public debt to exports, the stability of the banking system, and the degree of trade openness. In other words, the fall of the long-term interest rate depends on important reforms in the fields of public finance, banking and international trade that would finish up official dollarization.

6. Two additional benefits

Dollarization would soften financial stress. Notice that the Argentine Treasury's bill for debt interests jumped from 2.3% of GDP to 4% last year as a result of a big devaluation. Dollarization would contribute to financial stability.

Since the dollar circulating in the cities of Rosario and Mar del Plata would be the same as the dollar circulating in New York and San Francisco, the new currency will not be subject to devaluation. Therefore we would not experience sudden hikes in food prices and jumps of the level of poverty. Dollarization would contribute to political stability.

7. Dollarization deprives Argentina of seigniorage revenue

Not a strong argument. What is the opportunity cost of seigniorage revenue? To retain this revenue we should continue to deal with the peso, which has proven to be, once and again, a poor currency. The forgone benefits of not dollarizing are the opportunity cost of the peso. We find it hard to believe that the opportunity cost of the peso is smaller than seigniorage revenue in an economy marked by stagnation and demonetization since the 1970s.

8. Dollarization lacks a last resort lender

In the previous section we reviewed the solution that Ecuador and El Salvador found to deal with this problem. We said that that solution is not advisable for Argentina for its long history of contractual violations and institutional reversions. In other words, the probability that a Government in the middle of a financial crisis will put a bond forcibly into bank reserves or liquidity funds, thus unleashing banking panic is too high.

Panama found an interesting solution. A new model of commercial banking was set up in 1970. It works under national law, without liquidity funds or reserves requirements. It is highly integrated with World capital markets and has been very successful so far. Yet this solution is not advisable for

Argentina. The probability of repudiation of this type of banking legislation is as high as that of a new Convertibility law.

It's better to consider a commercial banking system under foreign law. Banks from abroad would establish branches in the country instead of limited liability companies. The branches would lend money to resident as well as foreign customers without any regulatory bias, in order to diversify risks and stabilize the value of deposits. Branches' balance sheets would merge with those of their headquarters, so that possible branches' losses are covered by their headquarters as in Panama. In turn, local banks in association with prestigious international banks would qualify to receive deposits and give loans on account of their foreign partners. This arrangement aims at three goals: a) commercial banking is safe from forced placement of bonds by Government; b) international banks take over the role of lender of last resort of commercial banking, employing to that end their own funds or those provided by their Central Banks; c) the cost of repudiation of banking legislation is high. A new commercial banking model like this one would have a higher probability to endure and help reduce country risk (Ávila, 2004).

9. Dollarization is a rigid system, so it is a bad policy.

It's not easy to understand the accurate meaning of this mantra repeated by 99% of my colleagues. They may be afraid of any of the following restrictions: a) the possibility of melting down a wage rise above productivity is no longer available; b) the same for the possibility of melting down a hike in public spending; c) the same for the possibility of foreign-exchange fine tuning; d) the possibility of adjusting to changes in capital flows is limited.

The first restriction is true. Government would somehow lose degrees of freedom in this aspect. In a dollarized economy, business and trade unions will have to set wages at a level consistent with a currency that cannot be devalued. If they made a mistake, they would pay for it through recession and unemployment. But only the first time, since the second time they will know how the system works. Of course, dollarization needs some degree of decentralized wage bargaining.

On the second restriction, international evidence teaches us that dollarization generates a bias towards fiscal discipline (Jácome & Lönnberg, 2009). Yet for Argentina this result may not be valid. As far as we know, there is no such thing as a fiscal arrangement with high cost of repudiation. Consequently, as long as banks do not fall and the currency is not devalued, we should accept an occasional sovereign default without dramatizing.

On the third restriction, first let's clarify the concept. A fine tuning policy consists of devaluing the currency a little bit in an economic downturn to put a limit to recession and deflation, and revaluing a little bit in an economic boom to put a ceiling to an excessive expansion and inflation. We have read about fine-tuning experiences in other countries but we do not recall any Argentine experience in this respect; we cannot lose a tool that we never had. Nevertheless the fundamental argument against fine tuning is not historical but conceptual. From the macroeconomic standpoint, Argentina is a weird case. Besides having a bimonetary economy, its production and employment levels are determined by country risk. Fluctuations in the country risk premium determine the direction and magnitude of capital flows; fluctuations in capital flows determine in turn aggregate demand fluctuations, and aggregate demand fluctuations determine finally the business cycle (Ávila, 2010). So we conclude that in the Argentine case fine tuning must be useless.

On the fourth restriction, we should not bypass the fact that fluctuations of capital flows cause large real-exchange rate fluctuations. But we should not bypass another big fact: Argentina has one of the World closed economies. Openness to international trade has a macroeconomic dimension. Assume two identical countries producing each a $100,000 per-year GDP. The closed country exports $10,000 per year and imports the same value; the open country exports $30,000 per year and imports the same value. A crisis happens and the trade balance goes from zero to $4,000 per year to finance capital outflows. In the closed country exports increase to 11,000 and imports decrease to 7,000, while in the open country exports increase to 31,000 and imports decrease to 27,000. Thus while

in the former case exports increase 10% and imports decrease 30%, in the latter exports increase 3% and imports decrease 10%. It's not bold to state that the pressure to raise the real-exchange rate (lower the real-wage rate) must be stronger in the closed country than in the open one. Consequently, this pressure must be stronger in Argentina, where exports stand for 10% of GDP than in Chile, Mexico or Spain, where exports stand for more than 30%.[3] For a country characterized by wild fluctuations of the real-exchange rate, dollarizing without an ambitious and lasting opening to trade could be a failure in ten year-time.

If Argentina had the power to issue reserve money and first-class sovereign debt, that is to say if the country had the capacity to apply classical countercyclical monetary and fiscal policies, it would be a waste of time to advise its dollarization. Now, taking into account that Argentina is a zero-trust country, we find that an irreversible dollarization, as developed here, is the safest passageway to monetary stability and economic liberties, which are generally the first victims of instability.

Re-shaping of commercial banking

Argentina underwent a mild banking panic in 1980, a severe one in 1995, and a fatal one in 2001 (Ávila, 2004). None of them happened by chance. A common factor played a role: the combination of fractional reserves and a fixed exchange rate. But these two regimes are not compatible; they should not exist side by side. A country with a fixed-exchange rate is prone to banking panics. It's easy to see why.

By definition, with fractional reserves banks can convert just a fraction of their deposits into cash. Therefore, not to close their doors in the middle of a banking panic, they need a lender to discount illiquid assets. But discounting implies monetary

[3] The degree of openness of Ecuador, El Salvador, and Panama is much greater than that of Argentina: 30%, 37% and 71% of GDP, respectively. Own estimates for the period 2005-2014 based on International Financial Statistics 2016.

expansion and, with a fixed-exchange rate, this leads to a balance-of-payments crisis.

Dollarization is the extreme version of a fixed-exchange rate regime. The Central Bank, whose goal is to help banks as a last resort lender, simply disappears or is transformed into a banking superintendent. The challenge is to find a balance between dollarization and fractional reserve banking. The Simons proposal can be an alternative. Though if implemented it would radically change the present organization of commercial banking. We guess that's why nobody has dared to do it so far (Ávila, 2004).

Among the main dollarized countries, Ecuador and El Salvador came up with solutions which combine high fractional reserves and liquidity funds under the supervision of so called central banks. [4] In turn, Panama applied a most interesting and innovative policy. In the next pages, we will review this policy and finally, building upon the Panamanian banking model, advance a proposal especially thought out for the Argentine case.

Panama was born as an independent state in 1903. The next year the country adopted the American dollar as legal currency and two banks (one American and the other State-run) were established. The banking activity expanded freely in the country thanks to its comparative advantage as a bridge between North and South America. Towards the end of the 1960s, more than 100 banks functioned in Panama though they were not proper financial intermediaries. The banking law of 1970 was a landmark in the development of banking. Many institutions fell while the Government aimed at attracting prestigious international banks (Superintendency of Banks of Panama 2018). Those that remained and the new ones were organized in this fashion:

* Towards year 2000, there were 59 banks with license to work in the domestic and the international markets; 28 with license to work in the international market exclusively, and one public bank, besides 14 representative offices (Goldfajn & Olivares, 2000).

[4]These fake institutions have no power to print money or control its quantity.

* Banks can be national or foreign. And the latter can organize as branches or limited liability companies.

* The balance sheets of the branches merge with those of their foreign headquarters.

* Foreign headquarters may certify that branches fulfil the prudential regulations set by their governments, especially those referring to required minimum capital or solvency. This certificate is taken as valid by the Superintendency of Banks of Panama.

* Headquarters pay for loses of their branches just as the Buenos Aires headquarters of Argentine banks pay for loses of their provincial branches.

* Established banks in the country can lend indifferently to local and foreign customers, without regulatory bias. Because of this feature Panamanian dollarization is known as a 'dollarization with financial integration' (Hanke, 2002; Moreno-Villalaz, 2005). Note that international diversification of bank assets helps stabilize the value of deposits.

* The system works without legal reserve requirements, interbank liquidity funds and deposit insurance, and of course without the assistance of the Federal Reserve System as last resort lender. Should a bank close, customers with deposits up to $10,000 would have priority to withdraw their money. The IMF and other multilateral institutions have recommended some of the above mentioned prudential norms, yet fears of moral hazard would have prevailed.

* The Superintendency of Banks demands two things basically: a) own capital must not be less than 8% of total bank assets, according to Basel rules; b) legal liquidity must not be less than 30% of net deposits. The latter are defined as total deposits minus deposits belonging to headquarters and other branches.

* Legal liquidity can be made of: a) gold or legal currency; b) net balances in foreign banks already approved by the Superintendency, checking accounts or savings accounts for a period not exceeding 186 days; c) debt issued by foreign governments or multilateral financial institutions approved by the Superintendency, actively traded in the Stock exchange; d) national or foreign firms' debt approved by the

Superintendency, actively traded in the Stock exchange, with investment grade certified by a risk-rating agency of international renown, at market value; e) national Treasury notes and other Government debt with a maturity of no more than a year, at market value.

The specialized literature does not record banking panics in Panama except for the crisis of 1987/89. At the Superintendency of Banks there are no memories of panics either, we were told. This is a striking fact for a country with no Central Bank. A good part of the explanation could be the blend of the legal liquidity requisite, the role of branches in the banking system, and the international diversification of loans.

The origin of the 1987/89 banking crisis was political; it was a conflict between General Noriega and the U.S. government. Banks shut down for nine weeks and a half, the Panamanian government defaulted on its debt, and national GDP fell more than 15% (Moreno-Villalaz, 1999; Hanke, 2002). As time went by, commercial banking regained stability. Russia's default in 1998 and the sub-prime crisis in 2008 did not undermine it significantly.

* Nowadays banking credit amounts to 90% of GDP. Out of this total, 98.4% goes to the private sector and the remaining 1.6% goes to the Government. The total does not include credit going to the rest of the World. It is worth noting that in Panama loans are divorced from deposits. Banks can lend over their deposits.

* Mortgage credit amounts to 30% of GDP, at interest rates of 5/6% per year and for a term of 30 years. Personal consumption credit represents 21% of GDP. And credit for retail business and construction average 13% of GDP each.[5]

Once again, for dollarization to be enduring we should reorganize commercial banking. The Panamanian case is quite suggestive. Financial integration stands out. In spite of the ups and downs of this country's life, commercial banking under national law has stayed integrated with World capital markets.

[5] Unless pointed out otherwise, information on the Panamanian banking system so far referred to was made available by J. Motta.

The axis of the Argentine commercial banking organization should be the establishment of branches of prestigious international banks. Our model differs from the Panamanian model in three aspects: a) national banks should become partners of prestigious foreign banks to receive deposits and make loans on account of their international associates; b) commercial banking should remain under foreign law; c) given conditions a) and b), the legal liquidity requirement could be lower than in Panama.

All discrimination of national banks is justified by the absence of a last resort lender. As regards the deposit-and-loan activity only, national banks would be a kind of branches of their foreign partners. This feature of the new organization would help to guarantee the stability of the banking system. And the substitution of foreign law for national law would bring the benefits of irreversibility we have emphasized in previous sections of this paper.

Last but not least, we cannot overlook the fact that Panamanian banks have been able to keep the value of their deposits stable for decades. Nowadays, we are talking about $48 billion, a figure close to 60% of Argentine bank deposits. It is a great accomplishment. Think that the GDP of Panama is barely a tenth of that of Argentina.[6]

Conclusion

Much has been written on dollarization. Not much, if any, on lasting dollarization, by which we understand a regime strong enough to withstand banking panics and the lobby of protected industries in order to repudiate dollarization and devalue the currency. Considering the long history of monetary instability and institutional reversibility of Argentina, we have discussed the main steps for a durable dollarization of this country. The purpose of our plan is for investors to perceive the new regime as irrevocable so that the Argentine risk premium moves downwards to the Chilean risk premium.

[6]Own estimates based on International Financial Statistics 2016 for Panama, and Informe Monetario 2018 for Argentina.

On irreversible reforms, by which we understand reforms with a high cost of reversion, we wrote somewhere else (Ávila, 2015). This time we provide examples and references of the operation of the banking and trade reforms. The most innovative part of the paper is Section 4, where we develop a banking model inspired by the experience of Panama. We call for branches of prestigious international banks to establish in the country under foreign law, and national banks to be partners of prestigious international banks in order to offer deposits and loans.

Dollarizing with financial integration and free-trade agreements with superpowers will bring a degree of monetary and financial stability not seen by this country in a century. From which we expect a strong incentive to capital accumulation within the Argentine jurisdiction.

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4 Jamaica's currency board, 1920-1961, and a comparison with its central bank

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Introduction

Jamaica struggled through several attempts at a unified monetary regime prior to the law establishing the Commissioners of Currency in 1904. In the country's early colonial history, Jamaicans used Spanish and Portuguese coins due to the absence of an established Jamaican currency. The Spanish and Portuguese coins, especially the Spanish silver real (also called the piece of eight or dollar) were widely used in the Caribbean and across the world. This period had a fixed exchange rate for the coins, although it resulted in the Jamaican government lacking full authority over monetary policy. It can be seen as an early example of what is now referred to as dollarization, when a country enacts the complete use of another economy's currency as its own (Hanke, 2002). This led to problems in Jamaica with shortages of coins in circulation, in part because of attempts to set exchange rates among coins at legal rates different from market rates. (For more information on the pre-currency board currencies of Jamaica, see Chalmers, 1893: 97-113.)

Due to the lack of coins in circulation and large amounts of outstanding debt, Jamaica began to seek alternative payment methods. In the earlytomid 1800s, the Jamaican government began to issue "island checks." These island checks were essentially IOUs to pay off government debts with an issuance of deferredliabilities (Callender, 1965: 2-5). The problem arose that the government did not back these deferred liabilities with any form of reserves and in many cases did not pay their holders with gold or silver when demanded. The exact date at which these defaults were occurring was not listed in the sources we consulted – although Callender remarked that it was leading up to the Jamaican Act of 1839 (see below). This caused a panic for all island check-holders when the government officially neglected payment due to lack of funds on hand. At this point, the Jamaican government experienced an event similar to a bankrun and effectively went bankrupt. The islandTreasurer eventually decided that the government would pay off all outstanding liabilities that it could with the coins it had on hand, and the remaining island checks rest would be converted into debt in the form of long-term callable bonds. These debt-issuances were given no specific maturity, but the government promised they would be paid off. To make matters worse, there was financial distress and recession in both the United States and United Kingdom in 1837 (Roose, 1948). These events led the Jamaican government to reform the currency. In the midst of the financial chaos in 1838, Jamaica emancipated slaves, causing an increase in demand for small-denomination currency notes and coins. This ultimately led to the decision by the Jamaican government in 1839 that as of 31 December 1840, only British coinage would be legal tender on the island (Jamaica Act of 1839). This law demonetized all Spanish and Portuguese currencies except for the Spanish gold doubloon, which had a fixed exchange rate at that time of £3. Jamaica henceforth used British coins until establishing a central bank and had no local coinage except for coins of one penny (1/240th of a pound) and below issued starting in 1869.

At this point, to counteract the loss of notes in circulation for the economy, the Jamaican government began allowing the emerging commercial banks to issue their own notes

(i.e.,"freebanking"). The main authority in commercial banking was the locally owned Bank of Jamaica, which had no connection to the central bank established in 1961. The Bank of Jamaica was allowed to issue notes backed by island checks, gold, or silver, but denominations had to be no smaller than £1. This was significant because £1 was more than an average Jamaican worker would receive in wages in more than one month's work (Callender, 1965: 4-9). The Bank of Jamaica continued to issue these notes until it was acquired by the London-based Colonial Bank in 1865, at which point the Colonial Bank essentially gained monopoly power. The Colonial Bank reigned supreme over Jamaica until Canadian banks began to open branches in Jamaica in the late 1800's. This period of "freebanking" appears to have been one of monetary stability, as was the case with many free banking systems elsewhere, although not enough research on it exists to reach definitive conclusions. Bank-issued notes were denominated in pounds, equivalent to pounds sterling, whereas in most other British West Indian colonies commerce was conducted in West Indies dollars (West Indies $4.80 = £1 sterling).

The Jamaican currency remained strong due to a fixed exchange rate to the pound sterling amidst a system where multiple currency brands were accepted. In the early 1900's the Jamaican government, led by the island Treasurer, began to consider the possibility of establishing a currency board. The Jamaican government decided that it was time to call for Jamaican government currency to become the main currency on the island. There were no motives mentioned in the works we consulted for why the Jamaican government wanted a currency board. It shall be noted however, that in British Honduras in 1894, a currency board had been established. This could have led the Jamaican government to the idea of creating itsown currency board. Government officials may have reasoned that the strong backing that a currency board offered would enable government currency to supplant notes issued by the commercial banks. This did not end the freebanking period right away, but eventually is created a dominant government-issued Jamaican note issue.

History of the Jamaican currency board

The Jamaica Commissioners of Currency existed from 15 March 1920 to 30 April 1961, when the organization was succeeded by the Bank of Jamaica, the central bank that continues in existence today. The currency board used the pounds-shilling-pence system identical to that of the United Kingdom, with Jamaican £1 = £1 sterling = 20 shillings (s.) = 240 pence (d.) (Bank of Jamaica, 2010). The currency board was intended to prevent depreciation of the Jamaican currency. However, as with any currency board, monetary policy was in effect transferred to the anchor currency, the pound sterling, which became an issue when Jamaica began to consider complete independence in the mid 1900's. This led to the demise of the currency board for Jamaica, a step whose wisdom has since been questioned.

The earliest written documentation calling for the necessity of a currency board in Jamaica dates back to 1904. On 22 September 1904, Jamaica published the Currency Notes Law, establishing a currency board to issue 10-shilling notes (Laws of Jamaica, Currency Notes Law, No. 27 of 1904). Although the board was not actually initiated for several years, the law created a three-man Commissioners of Currency. No documentation has been found for this paper on who were to be the commissioners, how they were chosen, and how long they would be active on the board. The three commissioners were allowed to issue and redeem notes in a combination of both gold and silver coin. The initial regulation called for a full reserve (100% percent) against the notes, of which two-thirds would be held in (gold or silver) coin and the rest in securities of the British Empire other than Jamaica. This reserve was referred to as the Note Security Fund. The Governor of Jamaica, with the approval of the British Colonial Office, could change the reserve of the Note Security Fund from the two-thirds coin and one-third securities to an even split of one-half of each (Bank of Jamaica, 2010). This change could happen by decree and needed no new law. The law also called for the government to accumulate a new reserve equal to at least 10 percentof assets, accumulated from interest on securities held. This was

referred to as the Depreciation Fund because that even if some securities lost value, foreign reserves would still be at least 100 percent with the additional 10 percentasset buffer. The Depreciation Fund made it extremely unlikely that the currency board would ever lack full backing against the value of its notes.

The Commissioners of Currency remained inactive for a number of years. On 19 September 1918the Currency Notes Amendment Law provided that notes of any denomination could be issued, as well as reducing the minimum coin reserve from two-thirds to one-half (Laws of Jamaica, Currency Notes Law No.17). This marked the true beginning of the currency board, and the Commissioners of Currency began to draw plans to print shilling notes. During the beginning of the issuance of securities, the Commissioners started hinting at the idea of dropping a significant coin reserve which paid no interest, to holding more securities that paid interest. This would yield the Commissioners of Currency greater return, albeit with some increase in risk.

On 9 January 1920, the Currency Amendment Law was passed (Laws of Jamaica, Currency Notes Law No.2). This allowed the Commissioners of Currency to accept and pay out British Treasury £1 and 10-shilling notes for the first time as if they were British coins. These notes, nicknamed "Bradburys" after the British Treasury official who signed them, were first issued in 1914 as a World War I emergency measure to provide lower-denomination paper currency than could be offered by the Bank of England, which was not allowed to issue notes under £5. The Commissioners of Currency officially issued their first notes under the aforementioned second amendment to the Currency Notes Law on 15 March 1920. Each of the three denominations bore a portrait of King George V, the ruling monarch of the United Kingdom from 1910 until his death in 1936. The notes also included a signature from C.C. Anderson, who was the Treasurer of Jamaica during the issuance of the notes and presumably one of the Commissioner of Currency.

The Colonial Bank, which held a de facto monopoly of commercial banking between 1865 and 1889 (Callender, 1965: 2-3), was issuing £1 and £5 notes. It was this, as well as a scarcity

of silver around the world at the time, that caused the Commissioners of Currency to choose to issue smaller denominations: 2/6 (2 shillings 6 pence, equal to £0.125), 5 shillings (equal to £0.25), and 10 shillings (equal to £0.50). The 5- and 10-shilling notes were issued throughout the currency board period. Undocumented stories exist that the 2/6notes were only supposed to be issued for a few years, but no official documentation of such a plan can be found. The denomination was withdrawn from circulation in 1922, just two years after it was issued.

The Commissioners continued with only the 5- and 10-shilling notes from 1922 into the late 1930s. The Currency Notes Law of 1937 gave that the Board of Commissioners power to issue £1 and £5 notes. The issuance of the larger denominations officially began in 1940, by which time the British Empire had entered World War II and demand for currency was rising strongly. The reserves and the redemption procedures of the currency board were revised to conform to those of other British colonial currency boards of the time (Currency Notes Law, Nos. 9 and 27 of 1937). Previously, notes had been redeemable in coins, which made sense because the denominations issued were mainly used as coin substitutes. However, once the board was allowed to issue notes of a larger denomination the Commissioners decided to change the medium of redemption from coins to sterling drafts on London. This law also made a commission fee legal. The board could charge a fee for commission on transactions while also being allowed to set minimum transaction sizes. The board initially established a 1.75 percent transaction fee on all transactions, which had to be at least J£5,000.The board could at this point issue both coins and notes, and the government Treasury officially stopped issuing coin in the 1940's, which meant the board was responsible for all government issued currency for Jamaica.

From 1939 until the end of the currency board period, the Jamaican pound remained fully convertible into the pound sterling but was not fully convertible into many third currencies. Restrictions on convertibility began during World War II to prevent trading with the enemy and continued

afterwards to prop up the value of sterling (Hanke & Schuler 1995). Many countries within the British Commonwealth agreed to full convertibility within the sterling area but were restricted convertibility outside the area, notably with the U.S. dollar, to attempt to support the value of sterling.

The currency board became the leading issuer of currency for the first time at the end of 1941, when the total value of its notes in circulation exceeded the value of commercial bank notes for the first time. It marked the transition from a free banking monetary system into a nation run on a currency board.

In 1954, a new Currency Notes Law established that no commercial banks other than the successor to the Colonial Bank — Barclays Bank (Dominion, Colonial and Overseas) — could issue new notes (Currency Notes Law, No.9 of 1954). This prohibited two major commercial banks, the Royal Bank of Canada and Bank of Nova Scotia, from issuing notes, which redistributed significant market share to the Commissioners of Currency. The law also included the Exchange Control Act of 1954 which imposed strict regulations on trading in currencies outside the sterling area (Currency Notes Law, No.50 of 1954). The intent was to support sterling, and due to the currency board's link to sterling, the Jamaican pound. In September 1954, the favorable economic conditions due to high earnings from the post-Korean boom allowed for expansion in both public and private investment. These were stated as the reason for the increase in currency issues. There was belief that the expansion of the colonial economies would need more currency circulation and reserves.

Due to the post-World War II weakness of the pound sterling, the reserve laws were soon reconsidered. Up to that point, as mentioned above, the board had to hold 100 percent reserves in foreign assets with a 10 percentadditional buffer to protect against depreciation of the securities the board held. (See the Jamaica Gazette tab in the accompanying Excel workbook.) However, the Commissioners believed that the foreign reserve ratio was unnecessarily high (Hanke & Schuler 1995: 21). The Currency Notes Law of 1956 allowed the board to hold Jamaican government securities worth up to J£1 million,

which was nearly one-fifth of total notes and coin in circulation (Currency Notes Law of 1956, Law 1). The government made further amendments to the foreign reserve ratios in 1958, raising the limit on domestic securities to J£3 million (Currency Notes Law of 1958, Law 1). This raised the total domestic securities the board could hold to about 35 percent of note and coin in circulation. At this point, the board's foreign reserve ratio fell to 65 percent of total notes and coin in circulation, deviating from currency board orthodoxy (Callender, 1965: 93-4).

Previously, the currency board had held a modest amount of domestic assets, apparently to be able to pay local expenses. The acquisition of substantial domestic assets was an early stage in the transition from the currency board to a central bank. The move away from currency board orthodoxy was intentional. Total liabilities outweighed total foreign assets for the first time in 1959 (see Figure 1 below). Before this, as seen in the coinciding data provided with the paper, it is evident that the total foreign assets usually accounted for 100-110 percent of total liabilities. The difference can be considered a networth plug in the accounting, something common in British Caribbean colonies (Krus & Schuler, 2014).

There was another important change in 1958. The Currency Notes Law of 1958 (mentioned above) stopped Barclays Bank from issuing notes. This officially left the board the sole issuer of local currency in Jamaica. In the absence of entities issuing competing currencies on the island, the Commissioners of Currency began to act similar to a central bank for the first time. With a monopoly over the issuance of notes and coin in circulation, the Commissioners held all monetary control possible at that time, albeit scarce. The currency board had no potential powers of monetary management other than to vary its holdings of Jamaican government securities within the legal limits, but it always held the maximum allowed, so it did not exercise that potential power (Hanke & Schuler, 2017).

In the 1950s, the American economist John Exter and the Austrian-British economist John Mars critiqued the colonial currency board in their works *Report on the Establishment of a Central Bank for Ceylon* and *The Monetary and Banking System*

and Loan Market of Nigeria. They claimed that the automatic exchange for Jamaican pounds for sterling would mean that there is an intrinsic relationship between changes in money supply and balance of payments. A surplus in the balance of payments would mean that the sterling would be deposited with the currency board in exchange for local currency. This would increase the stock of currency and generate price increases. If there was a deficit in the balance of payments, people would give up local currency and the stock of currency would be spent on the same number of goods, so prices would decrease.

However, this was not completely accurate, because the policy of commercial banks also plays a role in the change in money supply. If a surplus in the balance of paymentsis deposited in the banks, they can hold onto it, use it to increase loans and advances domestically, or invest in short-term assets abroad. The first option would not allow for any increase in income and the second and third would lead to an increase in the money supply.

Another criticism of the currency board system was that it requires a 100 percentforeign reserve backing. Holding domestic assets instead of foreign assets is not just a pure benefit, though. Domestic assets are less liquid and riskier than the foreign assets that currency boards typically hold, so the higher return that they may offer comes at a price. The price is the much higher frequency of devaluations under central banks than under currency boards.

The Jamaican economy during the currency board period

During the currency board era, the Jamaican pound was fully convertible to the pound sterling. From 1953 until 1960, real GDP per capita grew by nearly 7 percent. However, in the central banking, real GDP per capita fell in the 1970s and grew by a rate of roughly 2 percent for the remainder of the period. This can also be attributed to a sharp increase in the Jamaican population.

Over the same period from 1950 through 1961, gross capital formation had a strong growth from 1950 until 1957, but slowed down from 1958 through 1961. The increase in capital formation caused savings mobilization and the transfer of savings to investors in capital goods. The old financial institutions mobilized savings and transferred them to various parts of the economy, but new institutions were required to meet the needs of a changing economy. It was this change that spurred a slowing gross capital formation in Jamaica at the end of the period being analyzed (Callender, 1965: 75).

The tourist industry developed into a large portion of the Jamaican economy during the currency board period. In 1950, the total number of tourists was almost 75,000 and 1961 it exceeded 224,000. Tourism was even more important as a source of earnings in dollars(unlike the pound sterling, a fully convertible currency) than as a share of GDP.

Analysis of orthodoxy of Jamaican currency board

Tests on the currency board for Jamaica were done primarily by use of the *Jamaica Gazettes* and colonial annual reports. First, Krus & Schuler (2014) provided annual balance sheet data from Jamaica for 1921-1959 from the annual reports of the Commissioners of Currency and the colonial annual reports. They found annual data except for 1930 and 1940 (no data at all), and 1941-44 (note circulation data only). Due to the missing years, certain periods are left out of the tests and graphs below. For each of the figures below, there is no data input for 1930 and 1940-1944. These dates are disregarded. Years are labeled on every graph so this will be evident simply by looking at them.

The first test we did was the main orthodoxy test for a currency board. A currency board is supposed to back all notes in circulation with foreign assets to a specific reserve ratio. In the case of the Jamaican currency board — as mentioned earlier in the paper — the board was managed in a very specific way. Up until the later years around 1956, the board was supposed to hold a full reserve of 100 percent of foreign assets, and in

most cases, an additional buffer around 10 percent. This would cause the total value of the assets in reserve to never fall below the face value of the notes outstanding. This would signify an extremely orthodox currency board. After 1956, anticipating the dissolution of the currency board, the commissioners were allowed to transfer some of the foreign assets into domestic assets. This lead to the first deviation from orthodoxy around 1959 (as apparent in Figure 1). This shows that starting at the inception, the Jamaican currency board never deviated from orthodoxy and the 10 percent interest buffer was not only smart but critical as the value did depreciate in some years. The only period that the board was unorthodox fell in the period where they began planning to remove the currency board. This shows a perfectly orthodox currency board run by the Commissioners of Currency in Jamaica; slightly uncharacteristic of the similar Commonwealth colonies in the Caribbean.

The second test provided below determines the percentages of assets held in each asset class. The original legislation drafted for the commissioners of currency called for a specific breakdown of assets held in securities versus alternative means (i.e. Coin [silver]). As mentioned above, the initial regulation called for a full reserve (100 percent) where two-thirds would be held in coin and the rest in securities of the British Empire, outside of Jamaica. This reserve was referred to as the Note Security Fund. It was the Governor of Jamaica, with the approval of the British Colonial Office, that changed the reserve of the Note Security Fund from the two-thirds coin and one-third securities to an even split of one-half of each (Bank of Jamaica, 2010). Test 2, determines the exact breakdown, by year, of the asset classes as percentages of total assets. Determining from Test 1 that the currency board was orthodox by means of reserve ratios, it will now be determined the level of orthodoxy by asset classes held. The coinciding graph labeled Figure 2 shows exact values compiled from data from Dr. Kurt Schuler and Nick Krus in the Colonial Annual Reports, and checked by the Jamaican Gazettes in our digitization tabs.

The next test performed is a reserve pass-through test. This test shows the extent to which the change in net foreign assets are reflected in the change to the monetary base. Furthermore,

a reserve pass-through equal to 100 percent states that when net foreign assets rise 100 million, the Jamaican Commissioners of Currency Note's monetary base should also rise by 100 million. There should exists a margin of error, however, so deviations of 20 percent, above or below, are considered orthodox. To calculate the reserve pass-through, the change in the monetary base is divided by the change in net foreign assets. The absolute value of that outcome will yield the reserve pass-through. This test will be the hardest to view on the graph, but does back up the claims for the two previous tests. This test is important because it shows how the change in net foreign assets are influencing the monetary base. In a perfectly orthodox currency board, it would translate that each addition 'x' into the net foreign assets would result in an addition 'x' into the monetary base.

The final test performed involving looking at domestic assets. In order for a currency board to be orthodox, domestic assets should be at or around zeropercent of total assets. Many currency boards hold small amounts of domestic assets to pay salaries or expenses. In fact, from nearly the beginning of their existence, the Commissioners of Currency held some amounts of deposits with the Government Savings Bank or the Jamaican Treasury in order to pay these types of expenses. These deposits were not a large deviation from orthodoxy because the currency board did not seem to intend to maintain large, permanent domestic assets on the balance sheet. However, starting in 1959, the Commissioners began to invest in Jamaican government securities. These changes showed a departure from orthodoxy since they were intended to be permanent holdings of domestic assets.

Test 1: Orthodoxy of the Jamaican currency board

The first test is checking the orthodoxy of the currency board of Jamaica in the period of 1921-1959. All years were accounted for with proper data except 1930 and 1940-1944. The data used was from the annual balance sheet data provided by Krus & Schuler (2014), as well as the data from the Jamaica Gazette.

The first test was determining whether the face value of all the notes outstanding each year were accounted for (in the 100-110 percent range) in the assets held by the Commissioners of currency. This was done in the excel supplement to the paper. The first two years, 1921-2922, were different than the others so they will be described first. For the first two years the calculations for assets accounted for the following: Coin [coins and British Currency Notes] and Note Guarantee [Security] Fund Investments. The sum of the two aforementioned sections was divided by the total notes in circulation by the currency board to determine if the reserve ratio was above 100 percent of the notes in circulation. It was, of course, above the requirement. For the years following (1923-1959) the following categories of assets were used in calculations: Coin [Silver coin], British Currency Notes, Note Guarantee [Security] Fund Investments, Joint Colonial Fund, and Treasurer [for investment or on deposit]. The sum of those sections were divided by the total notes in circulation for each year to determine the orthodoxy. The following data illustrates the results from Test 1: Orthodoxy of the Jamaican Currency Board:

Deviations from Orthodoxy:

1923 - Foreign Assets / Currency Notes Outstanding = 99.94 percent

This was the only ratio less than 100 percent and it was only 0.06 percent off of the mark. The reason that this year may have deviated from the year before was due to a 45.77 percent decrease in Coin [Silver coin] + British Currency Notes from the previous year. The reason for this is unknown after extensive research, however, in 1924 the Coin [Silver coin] + British Currency Notes increased by 9.54 percent as well as an increase from J£0 to J£6,798.13 in Treasurer [for investment or on deposit]. This change in 1924 yielded a 35.62 percent increase in foreign assets held which rebounded the reserve ratio from 99.94 percent to 100 percent. After 1923 there was not another value below 100 percent until 1959.

1959 - Foreign Assets / Currency Notes Outstanding = 84.8 percent

As mentioned above, this case was done by shifting some foreign assets into domestic assets which diluted the Foreign

Assets / Currency Notes Outstanding. 1959 was the first year on the annual balance sheet where both Jamaican Government Securities and Jamaica Treasury Bills were accounted for. If the reserve ratio was changed to Foreign &Domestic Assets / Currency Notes Outstanding, accounting for the Jamaican Government Securities and Jamaica Treasury Bills, it would be 105.75 percent, which still would fall above the orthodoxy ratio.

Therefore, from the data provided above, as well as the graph below derived from the supplementary excel worksheet, we can see that the only true deviation from orthodoxy occurred in 1923. It should be notes that this was the first year that Coin [Silver coin] and British Currency Notes were listed separately. This could have caused a slight difference in the accounting. Even without an error, it was only 0.06 percent less than orthodox which can be seen as an extremely insignificant difference. *Hence,* Test 1: Orthodoxy of the Jamaican Currency Board proves that the Jamaican Currency Board was run almost flawlessly in terms of reserve ratios remaining in the required range.

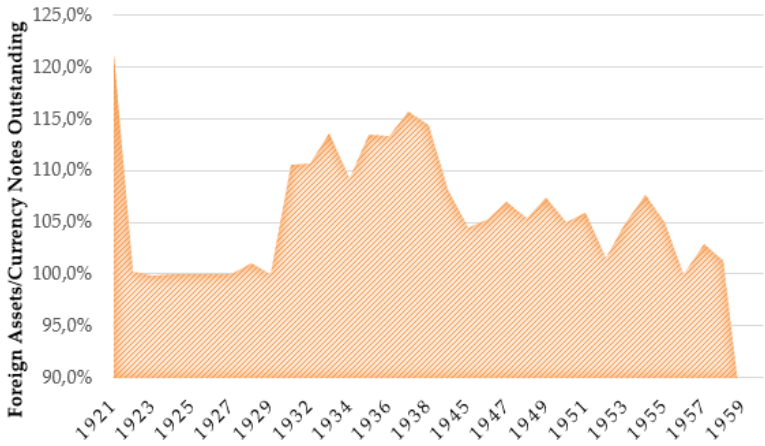

Figure 1. *Test 1: Orthodoxy of Jamaican Currency Board*
Source: Jamaican Gazette, Colonial Annual Reports, Calculations

Test 2: Reserve Ratio by Asset Type (aspercent of total assets)

The second test is checking the orthodoxy of the currency board of Jamaica in the period of 1921-1959 specifically by seeing the asset classes (as a percentage of total assets). All years were accounted for with proper data except 1930, 1941-1944, and those years were interpolated from previous year's data. The data used was from the compiled annual balance sheet data provided by Krus and Schuler, as well as data from the *Jamaica Gazette*.

The reason the test is important was because the original legislation calls for specific ratios of asset classes to be held in reserves. It is evident, based on results in Test 1, that the currency board was orthodox in terms of the required reserve ratios. However, Test 2 seems to show unorthodoxy in the percentage of each asset classes held, deviating from what the Commissioners originally called for. The initial law created called for only one-third of total assets in reserve to be securities, though after revision it was changed to one-half. Based on Figure 2 and Figure 3 above, 1921-1936 followed suit relatively well and was orthodox given a small margin of error. However, it is evident that after 1936 the percent of securities held out of total assets would significantly outweigh the other assets held. Figure 3 broke down the years into roughly 10-year averages to collectively show the transition away from the original law the commissioners called for. From 1938-1959 the percent of assets held in securities increased to a range of 70-90 percent and did not leave that range more than once.

The possible implications linked with how the Commissioners were supposed to break the assets down as percentages of total assets, and how they actually did, could come from a few things. First, as mentioned above, within the amendment to the initial reserve law, it called for the government to accumulate a new reserve that would have at least 10 percent interest from securities held. This was referred to as "The Depreciation Fund" because it claimed that even if some securities lost value, the offsetting balance of the foreign currencies reserve would still be at least 100 percent with the

additional 10 percent interest buffer (Laws of Jamaica, Currency Notes Law). Due to this buffer - it is possible that the Commissioners realized they could hold more securities increasing the Depreciation Fund, but also increasing returns which in turn made the reserve backing stronger. This can be seen as a true possibility in the supplementary data as the Depreciation Fund raised dramatically, however it raised less than the increase in face value of securities held. The Commissioners could have realized that, as long as the increase in depreciation was less than investment in new securities, they would still remain above orthodox levels of reserves backing the currency notes in circulation.

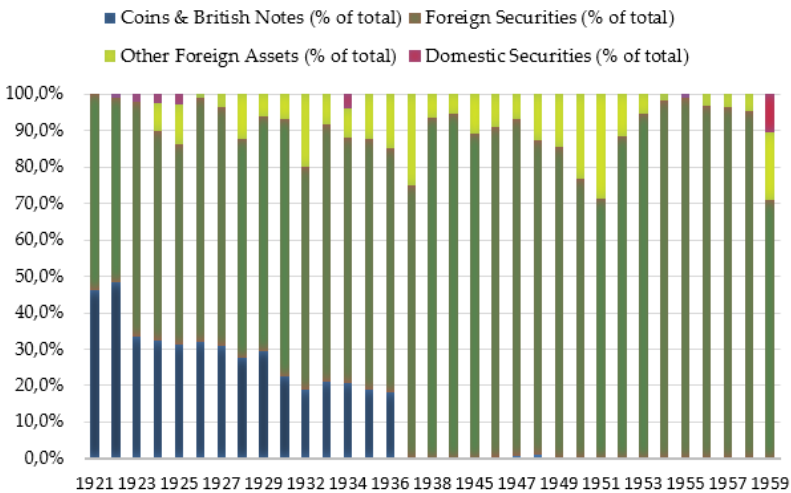

Figure 2. *Asset type as percent of total assets*
Source: Jamaican Gazette Colonial Annual Reports, Calculations.

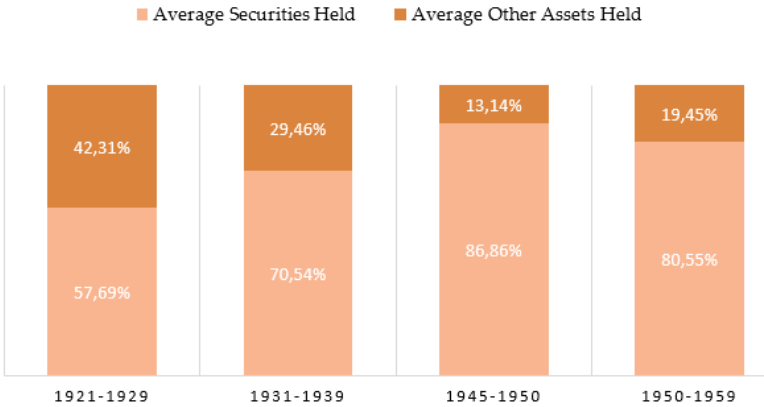

Figure 3. *10 Yr. Average asset class (as percent of total assets)*
Source: Jamaican Gazette Colonial Annual Reports, Calculations

Test 3: Reserve pass-through ratio

For a currency board to be orthodox, the reserve pass-through ratio should typically fall between 80-120 percent. (Reserve pass-through is the ratio of the change in the currency board's monetary liabilities to the change in its reserves.) In the case of the Jamaican Currency board, this seems to be the case for the most part. There are, however, instances where the ratio deviates from the orthodox constraints. The first significant instance is a jump near 300 percent in 1934. This jump, which exceeds the acceptable orthodoxy constraint, means that though the net foreign assets and the monetary base moved in the same direction, the monetary base increased much more. This point on the graph must be disregarded because the numbers are somewhat misleading. In the actual data, this year had one of the smallest changes: the change in the monetary base was around 6 percent and change in net foreign assets was closer to 2 percent. Therefore, this was not that significant. The same thing occurred in 1947 as well and was corrected in 1948 just like the data in 1937 was corrected in 1935. These corrections simply fell below 100 percent, meaning that the change in net foreign assets was growing faster than the change in the monetary base. In some currency boards, the reserve pass-through can fall below 0 percent indicating that the change in net foreign assets is moving in the opposite direction

of the change in the monetary supply which show an unorthodox currency board. This never occurred in Jamaica. The dotted line in Figure 4 shows a linear trend line that indicates the moving average of the reserve pass-through ratio. This line shows the true orthodoxy of the currency board as it stays within the constraints for the majority of the time and average out near the 100 percent goal of orthodoxy.

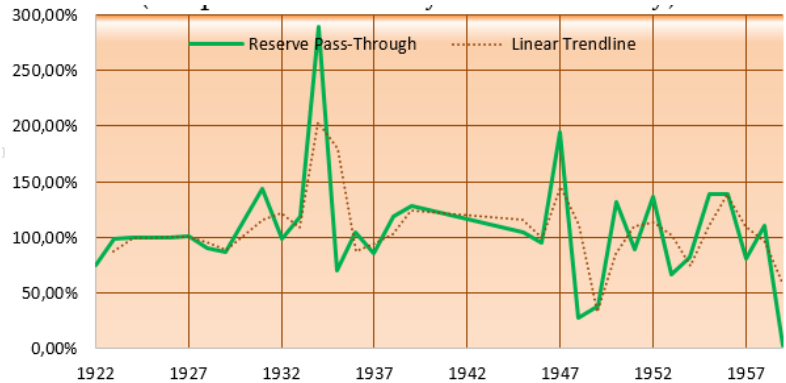

Figure 4. *Year over year reserve pass through ratio (percent) [100 percent= currency board ortodoxy]*
Source: Jamaican Gazette Colonial Annual Reports, Calculations

Test 4: Domestic assets

Domestic assets should be 0 percent of total assets or close to it in order for a currency board to be orthodox. Jamaica enjoyed a fluctuation in thepercentage of domestic assets the currency board held. From 1921 through 1923, domestic assets were 0 percent of total assets. However, after that, domestic assets ranged from between 0.82 percent and 28.69 percent of total assets. This indicates a deviation in orthodoxy when looking at this test, but the other tests (namely the foreign assets and the reserve pass-through) indicate the currency board was orthodox at times. Even though there was a fluctuation in the amount of domestic assets held, many currency boards hold domestic assets to pay salaries and expenses. Furthermore, for most of the period from 1921 to 1959, the Jamaican currency board held many domestic assets in the form of silver coins. At this time, the exchange rate

between the Jamaican pound and sterling was rigid, so at some point, local prices rose above foreign prices. As a result, people would exchange the Jamaican pound for foreign currency or buy cheaper goods from abroad. Then, the monetary authority would be likely to either devalue the Jamaican pound or shrink the monetary base.

This was in fact the case. Based on the reserve pass-through test, the change in the net foreign assets should match that of the monetary base. Deviations of 20 percent or below were considered orthodox when this test was performed. In looking at the reserve pass-through graph, it can be noted that the monetary base contracted at numerous times in twentieth century Jamaica. The most notable examples are between 1932 and 1937 as well as 1947 and 1950. During these years, the change in net foreign assets was negative as well.

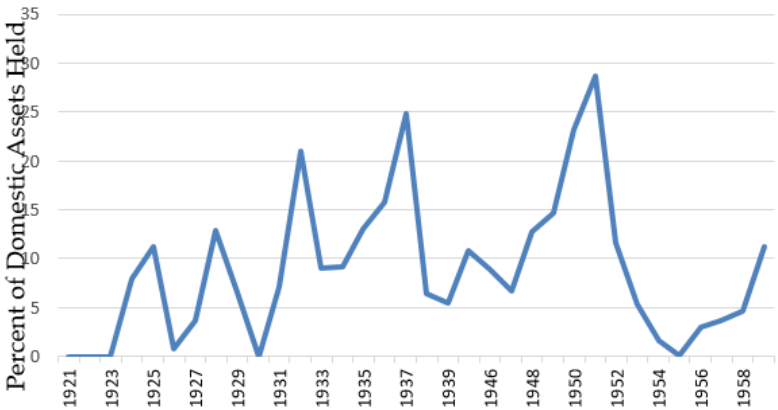

Figure 5. *Domestic assets held (percent)*
Source: Jamaica Gazette, Colonial Annual Reports, Calculations

Timeline of central banking developments in Jamaica

1950s: The Jamaican government starts to focus on the financial structure of the island and operations of institutions. The committee is established.

1957: Inter-Departmental Committee on the Establishment of a National Development Bank in Jamaica is constituted.

1959: Steps are taken to draft legislation for the establishment of the Bank of Jamaica.

1960: The Bank of Jamaica is established as the Jamaican central bank.

1961 and 1962: Inflow of short-term money from abroad causes an increase in bank liquidity.

1966: The automatic link with the pound sterling is removed and the power for the central bank to declare an independent par value for the Jamaican pound is established.

1972: The Jamaican dollar (which was floating with the sterling) is devalued on January 17, 1972 by 6.5% against all other currencies to correct the imbalance of the external sector.

1973: The system collapses with the floating of exchange rates. Monetary measures are introduced to ease pressure on the balance of payments.

1974: Further controls are implemented to stem the outflow of capital.

1976: The Bank of Jamaica Law is amended to allow the bank to provide credit to the central government to the extent of 30 percent of government revenue in a financial year.

1977: The external reserves of Bank of Jamaica fall by US$3.4 million.

1978: The government devalues the current exchange rate tostrengthen the balance of payments.

1981: Jamaica starts a new three year Extended Fund Facility (E.F.F.) agreement with the IMF.

1983: The balance of payments falls and an improvement of US$528 million is targeted. The parallel market is instituted, attempting to stabilize the Jamaican dollar.

1984: The Jamaican dollar is allowed to trade freely based on supply and demand.

1990: Bank of Jamaica sets inflation targets.

Central banking comes to Jamaica

As Jamaica moved toward independence, more economists and politicians called for greater local discretionary control in monetary policy. They saw central banks as a way of mobilizing funds for governments to use productively (Hanke & Schuler

1995: 22). A local central bank would supposedly promote faster growth because it could make its policy in the best interest of Jamaica alone, rather than being constrained by monetary policy determined in London. The Jamaican government began seeking outside advice on what to do about the future of the Currency Board. Although a report by the World Bank in 1952 saw no need for changing the currency board system, Jamaica seemed determined to establish a central bank (World Bank 1952: 279). It did so despite further cautionary advice. Advisors to both the Bank of England and Bank of Canada sent notes to the Jamaican Minister of Finance discussing negative implications associated with a Jamaican central bank. The advisor to the Bank of Canada, Graham F. Towers, actually provided extensive plans for Jamaica to continue their currency board. These plans would allow for economic growth and progress, however would eliminate the need for a central bank. This plan, outlined by Towers, was fueled by government expenditure (Towers, 1956: 18-19). After more reports and additional discussionduring 1958-1959, Jamaica established a committee to review all alternatives and conclude what would be done. That Jamaican committee recommended a central bank for Jamaica. The goal was to help eliminate the deficiencies that the currency board caused leading to supposedly subpar economic growth (Jamaica, Inter-Departmental Committee, 1958: 1; Hanke, 1995: 22). The committee proposed a central bank in 1959 and the government began regulations shortly after leading to the establishment of their central bank.

Passing the Law of 1954 that permitted Jamaican government securities to be held was the first step away from the currency board system towards a central bank for the island. In 1959, the initial laws and regulations were drawn up for the establishment of a Jamaican central bank. The laws passed in 1960 as the Bank of Jamaica Law (Laws 31 and 32 of 1960). The Bank of Jamaica opened on 1 May 1961. This date marked the official end of the currency board in Jamaica and the beginning of the centralbanking period, which continues today. In slightly more than a century Jamaica moved from a kind of dollarization to freebanking, then to an orthodox

currency board, then to an unorthodox currency board as a clearly transitional phase, and finally to acentral bank. The transitions between monetary arrangements were smooth, as was the case in most other British Caribbean colonies but often not in the independent countries of the region. The currency board successfully maintained a fixed exchange rate for Jamaican notes into sterling. It deviated from orthodoxy towards the end of its life, but in a clearly planned manner intended to provide a kind of transition to central banking.

Through The Bank of Jamaica, the Jamaican government continued to maintain the parity of the Jamaican pound with the UK pound even though the legal backing was reduced from 110 percent to 50 percent sterling. The Jamaican pound was freely convertible into sterling (though still not into third currencies such as the U.S. dollar), meaning that the interest rate set by the Bank of Jamaica could not decrease too far below the UK rate without causing capital flight.

During the central banking period of the late 1960s, the central bank devalued the Jamaican sterling, and then the Jamaican pound. The exchange rate fell from US$2.80 per Jamaican pound in 1961 to US$2.40 by the end of the decade. This was accompanied by a sharp increase in the current account deficit, from J£3 million in 1961 to J£45.1 million in 1969.

Monetary policy under central banking

The price of oil, a major import, increased by a factor of four from 1973 to 1974, hurting the economy. The government borrowed from the International Monetary Fund (IMF) for the first time. Now, the government raided the Bank of Jamaica's foreign-currency reserves, creating inflation. The bank's net foreign-currency reserves fell from J$113 million in 1970 to -J$545 million in 1980. The government was allowed to borrow up to 30 percent of estimated yearly revenue from the bank, up from an earlier limit of 15 percent. In fact, the amount of currency in circulation went up from J$18 million to J$32 millionfrom 1962 to 1968 and from J$37 million to J$102 million in 1974 (during the central banking period, the Jamaican pound was set to two dollars, representing an accounting change).

In the 1980s, the government set interest rate ceilings for savers and the currency was heavily managed. The economy shrank and inflation increased along with government budget deficits. In January 1983, the Bank of Jamaica eased foreign-exchange control by instating a dual exchange rate until May 1978. The M1 money supply increased from J$717 million In 1980 to J$4,016 million in 1990. M2 increased from J$1,712 million to J$12,891.

In the Bank of Jamaica in the 1990s was fairly successful. In 1990 and 1991, it loosened foreign-exchange controls and the Jamaican dollar was largely convertible for the first time since 1970. Jamaican started to experience an inflow of foreign currency for the first time. Inflation increased from8.4 percent in 1987 to 80.2 percent in 1991 due to large government budget deficits. The M1 money supply increased from 4,016 million dollars to in 1990 to 45,042 million dollars in 1999. M2 increased from 12,891 million dollars to 131,096 million dollars. The Bank of Jamaica adopted inflation targeting in the 1990, with an initial target of 12 percent. Currently (2019), the target is a band of 4-6 percent.

Comparing the currency board and central banking periods

Now let us compare some aspects of Jamaica's monetary and economic performance in the currency board era and the central banking era.

The first factor to analyze is real GDP per capita using millions of 2011 U.S. dollars. GDP per capita grew by an annualized growth rate of 8.0 percent from 1953 to 1963 (towards the end of the currency board period), but slowed in growth when central banking was implemented. In the period from 1963 to 1973, real GDP per capita grew at an annualized rate of 2.9 percent. Real GDP per capita growth slowed during more recent years, as can be seen in the graph below. Real GDP measured in millions of 2011 US dollars saw promising growth towards the end of the currency board period, but decreased throughout the central banking period and rebounded. Therefore, through analyzing real GDP, Jamaica's economy

seems to have performed better while operating under a currency board.

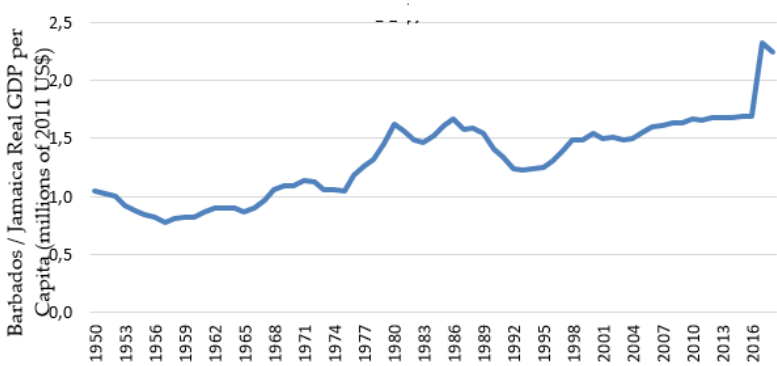

Figure 6. *Barbados / Jamaica Real GDP per Capita (millions of 2011 US$)*
Source: Maddison Project, B.R. Mitchell: *International Historical Statistics*

In the graph above, Jamaica's real GDP per capita is compared to Barbados, which like Jamaica is a Caribbean island that was a longtime British colony until achieving independence in the 1960s. Barbados had similar outputper capita to Jamaica in 1950, during Jamaica's currency board period. During the mid-1970s and 1980s, Barbados' real GDP per capitagrewfaster than Jamaica's. However, when observing real GDP with millions of 2011 US dollars, Barbados had a significantly smaller output when compared to Jamaica both in 1950 and 2016. However, real GDP per capita is a better measure of quality of life.

The next criterion to analyze is inflation during the currency board period compared to inflation in the central banking era. The highest inflation rate from 1941 through 1961 was 20.2 percent in 1948, with an average rate of 5.9 percent. Meanwhile, during the central banking period (from 1962 through 2000), the average inflation rates was 16.3 percent. The highest inflation rate was 50.9 percent in 1991. Once again, we see that although inflation was not particularly steady during the currency board period, it was comparatively more stable when looking at the central banking period. Below, in the graph, it can be seen that there was a stark difference between the average inflation rates during the currency board period and

central banking era. However, inflation in Jamaica was under control in the late 1990s and in recent years, has been stable. Despite a flare-up in the mid-2000s, the central bank has been fairly effective.

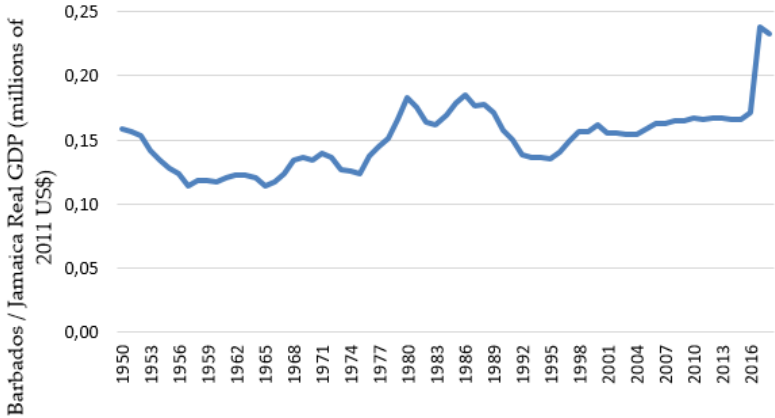

Figure 7. *Barbados / Jamaica Real GDP (millions of 2011 US$)*
Source: Maddison Project, B.R. Mitchell: *International Historical Statistics*

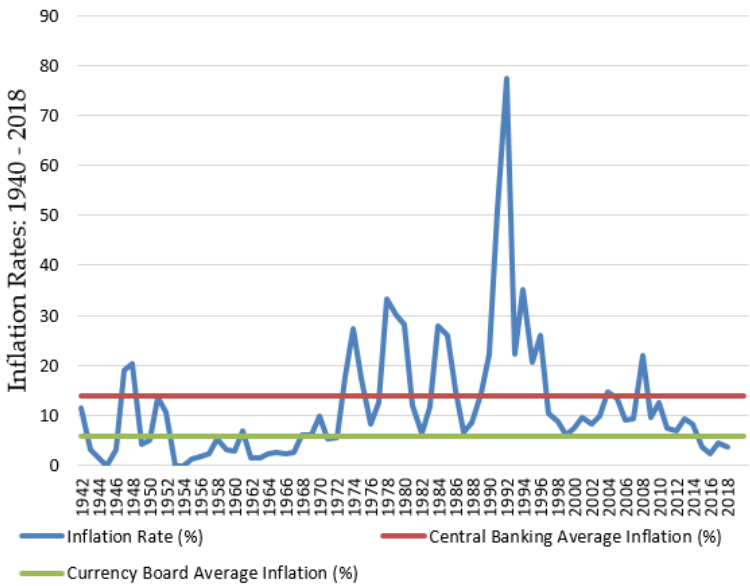

Figure 8. *Inflation Rates in Jamaica: 1942 - 2018*
Source: B.R. Mitchell: *International Historical Statistics*

The term "financial deepening" is used to describe increasing provision of financial services to people in an economy. Those who are unbanked or underbanked in a society are provided with increasing access to ways to finance themselves. Typically, financial deepening can increase the ratio of money supply to nominal GDP, allowing for liquidity increases and for people to have access to investment. Like many developing economies, Jamaica saw increases in financial deepening in both the currency board period and central banking era. From 1953 to 1961, the end of the currency board era, M2 as a percentage of nominal GDP was relatively stagnant at around 20 percent. However, with the implementation of central banking, M2 as a percentage of nominal GDP grew increasingly rapidly in the 1980s, but slowed down soon after. Today, M2 is around 50% of nominal GDP.

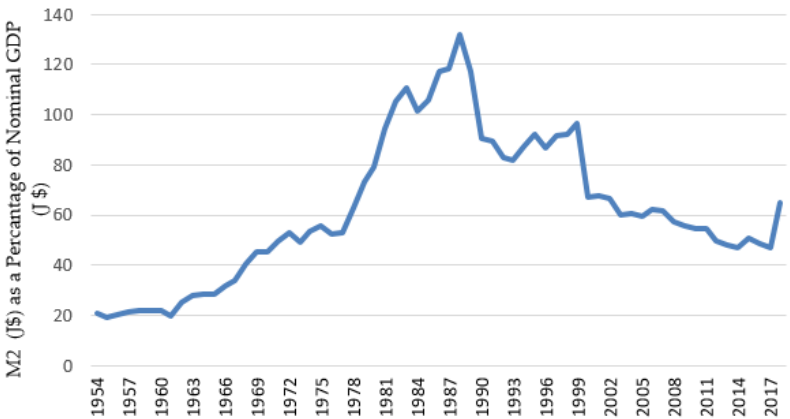

Figure 9. *M2 (J$) as a Percentage of Nominal GDP (J$)*
Source: B.R. Mitchell: *International Historical Statistics,* IMF International Financial Statistics

Another measure we can analyze is net foreign assets of the financial system (not just the currency board or central bank) as a percentage of the broader money supply. Here, M2 (currency in circulation plus demand and time deposits at banks) was used. As can be seen in the graph below, net foreign assets as a percentage of M2 was positive from 1953 up until 1975, starting at roughly 50 percent in 1953. This includes the

last eight years of the currency board era as well as into the central banking period. Then, the ratio became negative, indicating that there were fewer foreign assets than foreign liabilities, meaning that Jamaica shifted from a net lender to a net borrower.

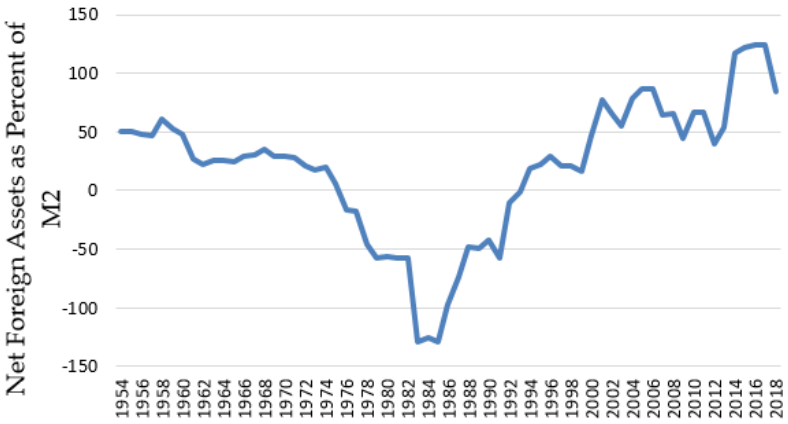

Figure 10. *Net Foreign Assets as a Percent of M2*
Source: B.R. Mitchell: *International Historical Statistics* and IMF International Financial Statistics

A country's current account balance is made up of the balance of trade, net primary income, and net cash transfers. A current account surplus means that exports exceed imports, while a deficit means that exports were less than imports. Towards the end of Jamaica's currency board period, in the early 1960s, Jamaica had a stable current account balance, slightly negative. However, as central banking era progressed, Jamaica had an increasingly negative current account balance (see figure below) for a long period. In numerous years in the 2000s, the current account balance was almost as much as US$3 billion in deficit. Typically, during strong economic expansions, imports surge, so the current account deficit widens. The currency exchange rate also affects the trade balance, and thus the current account. An overvalued currency makes imports cheaper and exports more expensive, widening the current account deficit. In Jamaica's case, the current account deficit increased not due to economic expansion (as

real GDP per capita was actually shrinking in the mid-2000s), but because of an overvalued currency.

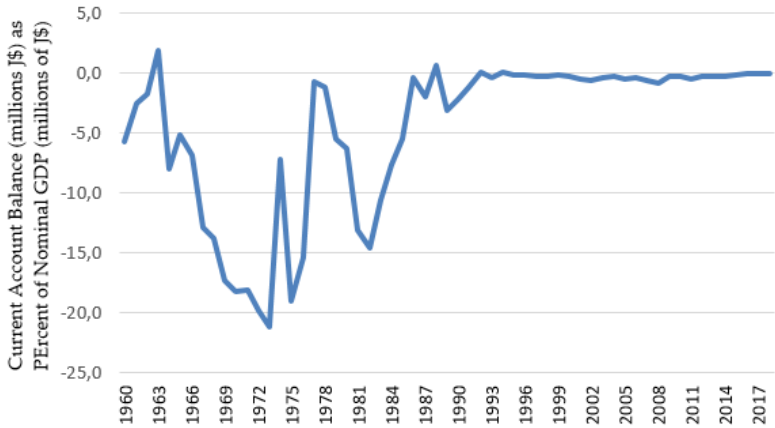

Figure 11. *Current Account Balance (millions of J$) as a Percent of Nominal GDP (millions of J$)*
Source: IMF International Statistics, B.R. Mitchell: *International Historical Statistics*

Another aspect in which it is worthwhile to compare the performance of the currency board and central banking periods is exchange rates. The Jamaican dollar depreciated substantially against the U.S. dollar since the end of the currency board period. Jamaica's currency used the pound sterling as the anchor until 1973, when it switched to the U.S. dollar. The U.S. dollar has since been either the official anchor or the unofficial gauge for judging currency depreciation. As can be seen in the graph below. In 1957, 0.7 Jamaican dollars were worth one U.S. dollar, but in 1978, the Jamaican dollar depreciated to being worth less than a U.S. dollar. As of 2018 the exchange rate was nearly 127 Jamaican dollars per U.S. dollar. Depreciation of the Jamaican dollar was related to increased central bank financing of the government. A similar trend can be observed from the graph depicting the exchange rate between the Jamaican dollar and the pound sterling. During the currency board period, the Jamaican pound was equal to the pound sterling. When the Jamaican dollar replaced the Jamaican pound at 2 dollars per pound, the exchange rate changed to 2 Jamaican dollars per pound sterling. This was

purely an accounting change, a redenomination rather than a devaluation. However, the Jamaican dollar clearly depreciated massively compared to the pound sterling as the central banking era progressed, specifically in the 1980s.

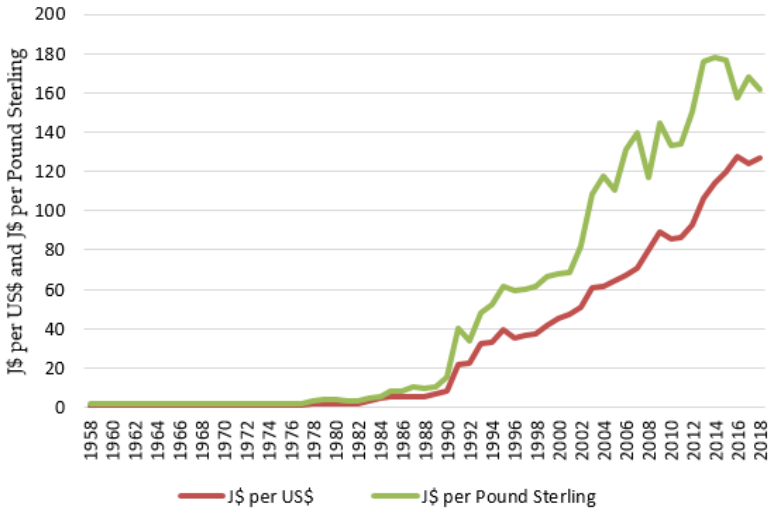

Figure 12. *J$ per US$ and J$ per Pound Sterling Exchange Rate*
Source: IMF International Financial Statistics Calculations

The main reason for the rapid inflation in the Jamaican dollar was the increase in the Jamaican government budget balance as a fraction of nominal GDP (both were measured in Jamaican dollars). During the last decade of the currency board period, the government budget balancewas either zero, or close to it. As a result, the government budget balance as a percentage of nominal GDP was stable. However, as the central banking period continued, this number became increasingly negative. In the 1980s, the Jamaican government budget balance as afraction of nominal GDP grew unstable. The government used many accounting tricks, making these budgetary increases difficult to track (Hanke 1995: 24). These spikes in government spending allowed for inflation andforeign debt to grow rapidly (see prior graphs). The currency board enforces a state of independence, where the central government cannot borrow money, allowing for

inflation to be lower and stable when compared to under an economy using central banking. The net credit to the government as a share of total assets to monetary authorities was low and negative for years during the currency board period, but increased in the 1970s and 1980s, as central banking came to Jamaica. This goes with the pattern that the government borrowed increasing amounts of money, causing inflation to rise as well.

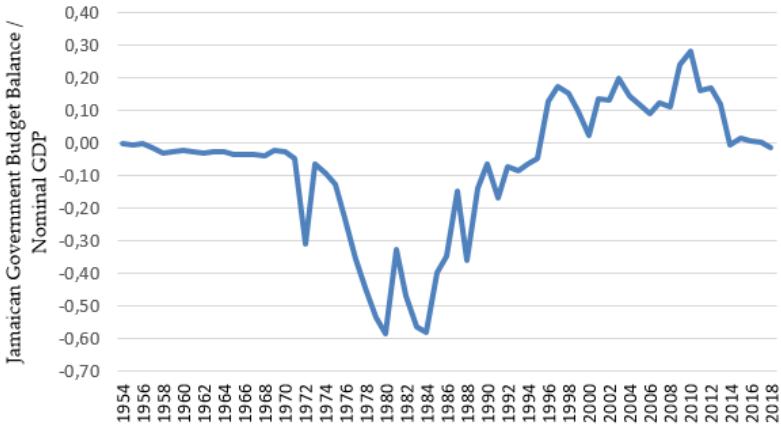

Figure 13. *Jamaican Government Budget Balance / Nominal GDP*
Source: IMF International Financial Statistics Calculations

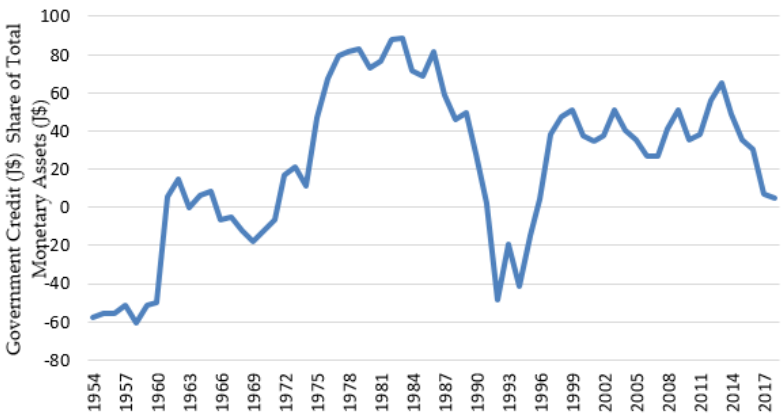

Figure 14. *Government Credit (J$) as Share of Total Monetary Assets (J$)*
Source: B.R. Mitchell: *International Historical Statistics*

It should be noted that there exist significant differences between the annual balance sheet data for Jamaica and the monthly/semi-annual data in the *Jamaica Gazette*. The most important difference is that the *Gazette* omits the Depreciation Fund, which is included on the annual balance sheet. Because the *Gazette* data are only partial, although we have transcribed them, where possible we rely on the annual data in the analysis that follows.

Conclusion

Jamaica struggled through several attempts at a unified monetary regime prior to the arrival of the Commissioners of Currency in 1904. In the country's early colonial history, Jamaicans used Spanish and Portuguese coins due to the absence of an established Jamaican currency. However, after the emancipation of slaves there was an excess demand for currency. To counteract the loss of notes in circulation for the economy, the Jamaican government began allowing the emerging commercial banks to issue their own notes. The Jamaican currency remained strong due to a fixed exchange rate to the pound sterling amidst a system where multiple currency brands were accepted. In the early 1900's the Jamaican government, led by the island Treasurer, began to consider the possibility of establishing a currency board. After many years of preparation, the currency board period began. On 22 September 1904, Jamaica published the Currency Notes Law, establishing a currency board to issue 10-shilling notes. Although, the Commissioners of Currency remained inactive during this period. On 9 January 1920, the Currency Amendment Law was passed this allowing the Commissioners of Currency to accept and pay out British Treasury £1 and 10-shilling notes for the first time as if they were British coins. From 1939 until the end of the currency board period, the Jamaican pound remained fully convertible into the pound sterling but was not fully convertible into many third currencies. The Currency Notes Law of 1958 stopped Barclays Bank from issuing notes. This officially left the board the sole issuer of local currency in Jamaica. In the absence of entities

issuing competing currencies on the island, the Commissioners of Currency began to act similar to a central bank for the first time. The Jamaica Commissioners of Currency officially existed from 15 March 1920 to 30 April 1961. After which, it was succeeded by the Bank of Jamaica, the central bank that continues in existence today. It was due to the laws passed in 1960 as the Bank of Jamaica Law creating the Bank of Jamaica, which opened on 1 May 1961. This date marked the official end of the currency board in Jamaica and the beginning of the central banking period, which continues today.

Altogether, the Commissioners never deviated (more than 0.6 percent) from orthodoxy up to the point that note issue by commercial banks ceased and they became the sole issuers of currency for the island. This is when they started acting like a central bank and they amended the laws making the reserve requirements less harsh. The currency board acted as a perfect transition from a system in which multiple currencies were accepted into a central bank regime. It took many years but can be seen as a very effective way to implement a dramatic change. Jamaica's currency board can certainly be referred to as one of the most successful regimes of any Caribbean Colony of that time.

During the analysis comparing the various aspects of the Jamaican economy between the currency board and central banking periods, it was seen that the economy fared better during the currency board era. Jamaica saw a lower average inflation rate during the currency board period, more consistent financial deepening, a smaller current account deficit, and better real GDP per capita growth. However, in recent years, Jamaica's economy has performed better as the central bank has chosen to target a certain inflation rate.

Note only published data and statistics were examined, as a lot of data is unavailable for use. Some data, such as years, may have been missing and were not included in this paper. Utilizing that yearly data, if available elsewhere, might provide a more accurate detailing of the Jamaican currency board. The most important aspect of this paper was to test overall orthodoxy and provide a background of the history. Our data

should be useful to any later researchers, as well as the history to the monetary regimes.

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5 The privatization of social security in Chile 1980-present

Ryan ***Baber*** & Edward ***Taufer***

Introduction

Jose Piñera, the mind behind the monumental pension reform in Chile, is a true scholar. He studied the works of John Locke, Adam Smith, Karl Popper, and of course, the great Milton Friedman. It was in Friedman's 1962 book, *Capitalism and Freedom,* that Piñera discovered the concept of a privatized social security system. Piñera believed that to resurrect Chile from a state of poverty and oppression, sweeping economic and political reforms based on individual freedom must occur. In his essay, "Empowering Workers: The Privatization of Social Security in Chile", he writes:

> My ideas for pension reform were then part of an overall vision of a free market and a free society in Chile. At the ministry, I assembled an excellent team to help me design not only the new system but also a transition strategy. For decades in Chile, those striving for pension reform had failed, because their plans were partial and flawed. I decided that we should "take the bull by the horns." My motto was that we needed a "radical reform

> with a conservative execution." I remember often reiterating to my team that there was nothing as satisfying in life as to do something others deem impossible. We were bound together by our faith in the power of ideas and by the conviction that we could make a difference for millions of Chilean workers.

Chile's pension reform

On November 4th, 1980, Chile enacted its Pension Reform program, which has since become the gold standard for private social security systems around the world. With this new program, Chileans who were previously under the old pay-as-you-go system, could opt out of the government run public pension system and put their money into a privately managed Personal Retirement Account (PRA). "Since 99% percent of the employed workers are now in the PRA system, the end result was a 'privatization from below', that is reflecting worker's wishes, of Chile's pension system" (Piñera, 1996).

Every month, the employer deposits 10% of a worker's wages tax-free into his or her PRA; the worker then has the option to make up to an additional 10% tax-deductible deposit into the PRA. Private pension fund companies manage these PRA's. The worker has the freedom to choose which company he or she wants to manage their PRA. These private pension fund companies (known as AFPs, or "Administradora de Fondos de Pensiones") exist in an industry purposefully designed to be competitive. Both domestic and foreign companies have the right to apply to the Superintendency of the AFPs (officially La Superintendencia de Pensiones de Chile) to enter the AFP industry. The worker also has the right to move his or her PRA to another AFP at any time. This competition benefits the account holder through the encouragement of better returns, better service, and lower commissions. Each AFP manages a mutual fund family with five funds, each with different allocations of stocks and bonds. Workers may choose which funds he or she wants to invest in based on his or her risk preference, within limits. For example, older workers must own more stable funds with primarily bonds, while younger workers may have up to 80% of their holdings in equities. AFP managers

have the ability to invest the funds' money in any asset of their choosing. There is no requirement to invest any money in Chilean bonds or equities. Furthermore, AFPs are subject to government oversight. "Legally, the AFP companies and mutual funds are separate entities. The AFPs are subject to strict and technical oversight by the Superintendency of AFP, a government organization" (Piñera, 1996).

Upon retirement, a person has access to all the funds that have accumulated in their PRA. The retiree pays taxes on withdrawals according to their tax bracket at that time. A key difference between the new pension reform program and the last is more flexible access to the accrued retirement benefits. The former pay-as-you-go system required men to work until 65 and women to work until 60. Under the new system, workers can choose to retire at any age, giving workers the option to continue working longer than what may be deemed necessary. The retiree has the ability to access their funds when he or she is ready, whether that be before or after the previously mandated "retirement age." Workers could opt to have more of their salary diverted tax-free by their employers in order to accelerate their retirement plans or to create larger nest eggs.

"Safety nets" exist for workers whose accounts perform especially poorly. As long as a worker contributed to a PRA for a minimum of twenty years and has reached the minimum age, he or she is eligible for a "minimum pension," also known as a solidarity pension, funded by general government revenues once their PRA is depleted (Piñera, 1996). Note a minimum age requirement exists for a solidarity pension, but not for those whose pensions have performed adequately. This system has since been updated which is visited in future sections.

"In the PRA system, workers with sufficient savings in their accounts to buy an annuity equal to 70 percent of the average salary of the previous 10 years, as long as it is higher than the 'minimum pension', can cease working at any time, begin withdrawing their money, and stop contributing to their accounts. Of course, workers can continue working after beginning to retire their money. A worker must reach the legal retirement age to be eligible for the government subsidy that guarantees the minimum pension. But in no way is there an

obligation to cease working, at any age, nor is there an obligation to continue working or saving for retirement benefit purposes once you have assured yourself the benefit described above" (Piñera, 1996).

Retirees have three basic payout options. Under the first payout option, the retiree may use the funds that have accumulated in his or her PRA to purchase an annuity from any private life insurance company. The purchased annuity must pay a monthly income for the remainder of the retiree's life, indexed to inflation. It must also provide survivors' benefits for the retiree's dependents. In the second payout option, the retiree may leave the accumulated funds in the PRA and regularly withdraw money, subject to limits based on the retiree's life expectancy and dependents. If the retiree passes away, the funds left in the PRA are given to heirs as a portion of the retiree's estate. The third option consists of any combination of the first two.

The PRA system is entirely supported by employees. Because employer contributions are viewed as part of one's gross wage, all PRA contributions are paid by the worker, thereby giving him or her complete control of his or her future retirement savings. Since the PRA is not provided by an employer, workers have the opportunity to leave a firm and have their retirement savings transfer with them. This contrasts with some pensions systems that punish workers who leave the company before a given number of years. Not only is it easy for workers to transfer retirement funds across companies, it is also easy for PRAs to be transferred from one AFP to another, due to the fact that each PRA is invested in securities. The PRA system is intended to promote labor market mobility and flexibility.

One of the major problems with pay-as-you-go systems is unfunded pension liabilities. Current workers pay taxes to support the retirement of the retired population. This creates a conflict when the number of retirees grows larger than the working population. Unchecked, this could lead to future bankruptcy problems, such as those currently faced by the United States. The PRA system seeks to eliminate the

possibility of intergenerational conflict caused by unfunded or underfunded pension liabilities.

The transition

One of the main challenges in fully implementing a PRA system is managing the transition from a traditional pay-as-you-go system. Chile completed the transition by adhering to three rules.

1. The government promised to honor previous agreements made to older citizens. Those who had been guaranteed pension benefits or who were already receiving benefits would not be affected by the change.
2. Current adults in the labor force had the option to remain in the pay-as-you-go system or transition to the PRA system. Those who made the switch to the PRA system received a "recognition bond" that was deposited in their new PRA. The bond earned four percent interest and was indexed to inflation. The recognition bond matured at retirement; however, it could be traded in secondary markets to allow workers to build capital. The issuance of these bonds ensured that workers who already contributed to the pay-as-you-go system did not start with zero Chilean pesos in their PRA.
3. All new adults entering the labor force were automatically enrolled in the PRA system. This guaranteed that the pay-as-you-go system would slowly be phased out and would completely end when the final pay-as-you-go system worker entered retirement.

Through the transition, the establishment of the AFP industry was heavily regulated. For a six-month period, no AFP could begin operations. This grace period attempted to give all parties the opportunity to establish an AFP. Unlike many new industries, the AFP industry had a clear conception and birth date.

Because fiscal costs would be incurred during the transition, five methods were used to finance the costs of the PRA system's implementation:

1. Issuing debt:

By using debt, the system could share costs across generations. Debt also created interest bearing securities that could be added by AFPs to PRA portfolios.

2. Implementing a "transition tax":

Under the PRA system, retirement savings were actually taxed less than the amount paid in payroll taxes under the old system. A portion of the difference was used as a temporary transition tax.

3. Selling government assets:

The Chilean government sold off large government owned enterprises. The government used funds from the purchase of these companies to finance the PRA, while the workers benefited from more efficient, privatized companies.

4. Reducing government expenditure:

A consistent government budget surplus, coupled with strict limits to increasing government expenditure, helped finance the transition.

5. Tax revenue from economic growth:

The economic stimulus from the new PRA system substantially increased tax revenue.

A history of the AFPs

Currently, there are seven AFPs in the system, five of which have existed since the inception of the system in 1981: AFP Capital, Cuprum, Habitat, PlanVital, and Provida. AFP Modelo was created in February of 2007, and AFP Uno, the newest fund in the system, began operations on October 1st, 2019.

At the time of the establishment of the AFPs in 1981, funds were only allowed to invest in "low-risk domestic instruments" including but not limited to government bonds and highly rated corporate bonds. In fact, 100% of funds could be invested in government bonds. As time passed, the proportion of a fund that could be invested in government securities decreased, and higher exposure to stocks and other securities were gradually ushered into portfolios. In 1996, AFPs began to invest in foreign securities. By being able to invest in foreign securities, funds could chase higher returns while taking pressure and reliance off of domestic markets (Kritzer, 2008).

In 1981, only one type of allocation was permitted, today known as Fund C. The returns for Fund C for each of the original five AFPs is depicted below in Figure 1.

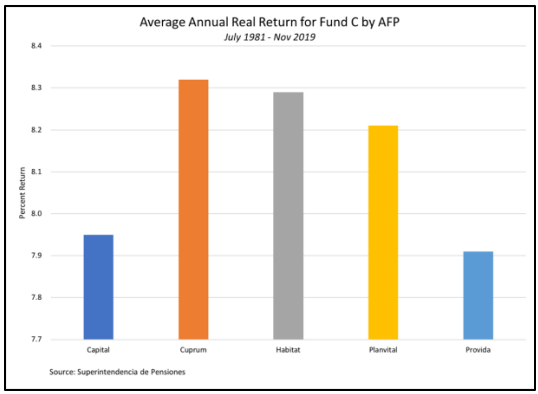


Figure 1. *Average annual real return for fund C by AFP*

In August of 2002, a law was passed that "requires each AFP to offer four different types of funds —called Funds B, C, D, and E—with varying degrees of risk. AFPs may also offer a Fund A with up to 80 percent of its assets in equities" (Kritzer, 2008). The fund equity limits are outlined in the table (Figure 2) below.

Fund Type	Limits on Investments in Equity	
	Minimum (%)	Maximum (%)
A	40	80
B	25	60
C	15	40
D	5	20
E	n/a[1]	n/a[1]

Source: SAFP 2007
[1] Fund E consists of primarily fixed income.

Figure 2. *Limits on investment in equity*

The Superintendency of the AFPs regulates each fund such that it has minimum and maximum rates of return it must meet over a 3-year period. The AFP originally had to maintain fluctuation funds, comprised of any returns over the maximum rate of return, to cover any future shortages. According to Law 3500, if an AFP missed its minimums and did not have enough

saved in the fluctuation fund, the government "makes up the difference, dissolves the AFP, and transfers the accounts to another AFP" (Kritzer, 2008). The 2008 reform (covered in a later section) eliminated all fluctuation funds and distributed the monies among the AFPs.

The average annual real rates of return for each fund type for the original five AFPs are shown in Figure 3. The return rates are shown since the multifund law passed in 2002.

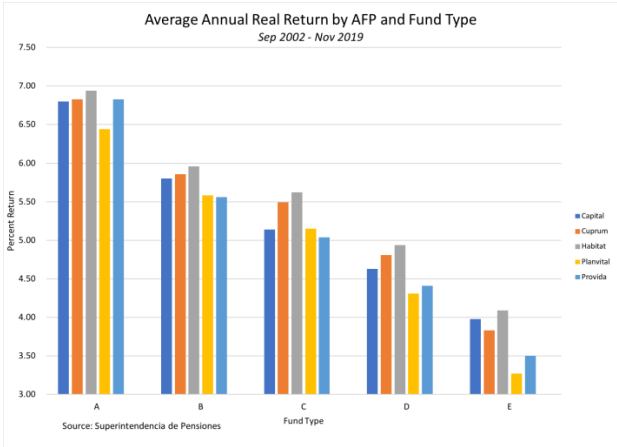


Figure 3. *Average annual real return by AFP and fund type*

Figure 4 below displays the total annual returns for each fund type. This was calculated by finding the average return of each AFP's specific fund.

System Returns by Fund Type Since Inception	
Fund Type	Average Return (%)
A	6.85
B	5.78
C*	8.12*
D	4.65
E	4.64
Source: Superintendencia de Pensiones	
*Note: Fund C was established in 1981. All other funds were established in 2002.	

Figure 4. *System return by fund type since inception*

To properly analyze AFP returns, it is necessary to compare the returns to a benchmark. One can compare the AFP system

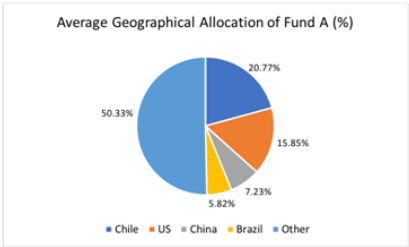
returns to the real returns of the Santiago Stock Exchange, Chile's domestic stock market. The following analysis uses the IGPA Index as its benchmark. The IGPA is a market capitalization-weighted index that measures prices of a majority of the Santiago Exchange's listed securities. According to Bloomberg, from August 2002, when funds A through E were established, to October 2019, the Chilean stock market has seen an average annual nominal return of 9.5507%. To calculate real returns, Chilean year-over-year inflation over the same period (08/01/2002 - 10/30/2019) was subtracted from the nominal rate of return. According to the EHPICL Index, Chile's inflation index, year-over-year inflation for that period was 3.2%. This demonstrates that the Chilean stock market, from August 2002 to October 2019, has seen an average annual real return of 6.3507%.

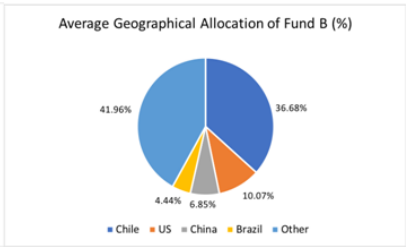
Remarkably, this real rate of return is in line with the real profitability of the Fund A system since its inception (Figure 4). This is of note due to the fact that Fund A was able to match these returns while still maintaining a less risky portfolio comprised of at least 20% fixed income. More fixed income reduces total risk. In addition to an asset-diversified portfolio, Fund A achieved these results while having international, not just domestic, market exposure. This is a unique feat for the AFP system and, one could say, a success to Dr. Piñera's initial goals of giving citizens superior money management and independence under a PRA private pension system.

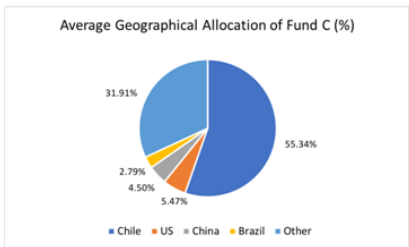
Further AFP fund analysis

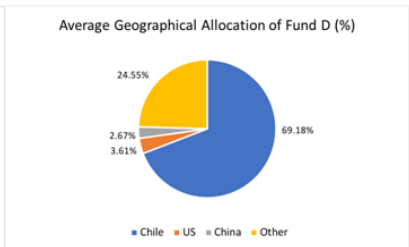
To fully understand the AFP fund types and their returns, it is important to analyze each fund's average geographic allocation. To conduct this analysis, the percent of each AFP's Fund "X" investment in Chilean and foreign holdings was computed. Then, an overall system average was calculated using the individual allocations of each fund. This analysis is important because with the allowance of international diversification in 1996, AFPs could change each portfolio's domestic market exposure, allowing the AFPs to manipulate

each fund's risk and returns. Below is a series of pie charts showing the average geographic allocation of each fund type.









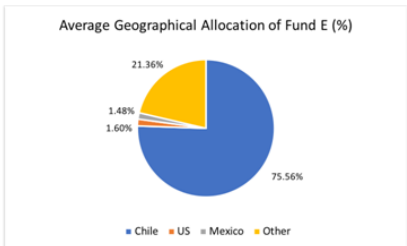


Figure 5. *Averages*
Source: Bloomberg

As seen in Figure 3, Fund A has consistently had the highest rate of return since 2002. While this fund may be less risky than a Chilean stock market index fund due to equity and fixed income diversification, Fund A is still the riskiest of the five types of AFP funds. Though Fund A has the highest share of equity investments, this geographic analysis concluded that Fund A also has the smallest allocation of Chilean holdings. As

the funds get less risky and decrease their holdings in equities, the share of holdings in Chilean investments increases from 20.77% of Fund A (Figure 5) to 75.56% of Fund E (Figure 8).

Regardless of the fund type, the largest proportion of holdings are Chilean. However, there is no requirement for AFP funds to hold Chilean stocks and bonds. With that said, Chile is one of the strongest economies in Latin America with highly rated debt, so holding Chilean instruments is a valid investment. Other countries with notable geographic allocations are the United States, China, Brazil, and Mexico.

Results

Within one month of inception, a quarter of the labor force signed up for the PRA system; today, over 99% of Chilean workers are enrolled in the PRA system.

According to Piñera, "since the system began to operate on May 1, 1981, to September 2014, the average real return of the balanced Fund (Fund C) has been an extraordinary 8.6 percent per year (during 33 years). Of course, the annual yield has shown the oscillations that are intrinsic to the free market-ranging from minus 3 percent to plus 30 percent in real terms, but the important yield is the average one over the working life of a person (say 40-45 years) or the full working plus retired life (say 55-60 years) if a person chooses the programmed withdrawal option" (1996).

Total assets under the PRA system were 70% of total Chilean GNP in 2014and are forecasted to equal GNP in the future. Economists have attributed Chilean economic growth over the last several decades to such long-term capital investment. The Pension Reform of 1980 has decreased overall poverty numbers due to an increase in old age, survivors', and disability benefits. Additionally, pension and welfare changes lowered Chilean government expenditures by several percentage points between 1981 and 1990. According to Piñera, "the Pension Reform of 1980 was the single most important structural change that contributed to the doubling of the growth rate of the economy in the 1985-1997 period (from the historic 3% to 7.2%)." Private pensions allow Chilean workers to contribute to

the growth of the economy and reap its benefits. However, this also comes with enduring the consequences of domestic market volatility and market crashes, which is why foreign diversification became inevitable.

Pension reform in 2008

In March of 2008, a major round of Chilean pension reform took place when Law 20.255 was passed. The reform was pushed due to low rates of replacement—the percent of a workers full time income that was covered under the pension upon retiring—in addition to estimates that "more than 50% of them [individuals in the pension system] would not meet the requirement of 20 years of contributions for access to the state guarantee of the minimum pension," among other things.

"The Pension Reform Act of 2008 contains about 100 measures, which can be classified into seven categories: i) solidarity pension system; ii) gender dimension; iii) policies for the most vulnerable youth; iv) policies for independent workers; v) improvement of the individual capitalization system; vi) public institutions, and vii) fiscal sustainability.

The Chilean pension reform of 2008 had three main objectives. The first was to create a solidarity pension system (SPS) that combated poverty among the elderly of 65 years and older (and people with disabilities). This meant that the state assumed the role of guarantor of the pension system for the population belonging to the first three income quintiles (60%), in addition to establishing a universal rights perspective around social protection for those who will develop their working life in Chile. The second objective was to increase the coverage of both assets and liabilities from vulnerable groups, specifically young people, women and independent workers. The third objective of the reform was to contribute to the improvement of the individual capitalization system through the promotion of competition, the regulation of investments, and the cost reduction and strengthening of voluntary pension savings" (Arenas de Mesa, 2019).

The creation of the SPS was focused on increasing overall coverage of workers under the pension system. Between March

of 2008 and December of 2018, it is reported that nearly three times the number of workers were covered under the SPS than had been previously covered under the old welfare pension system as coverage increased from 610,000 to about 1.5 million individuals.

Pension reform in 2019

Over the last several years, starting primarily in 2017, political tensions have stirred up talks of another pension system reform in Chile, the largest since 2008. According to Allan Brown of BNAmericas, "regarding AFPs, for some time now there has been a high level of discontent among workers because of the small pensions they tend to provide and the size of the fees the AFPs charge. People are also generally aware of the healthy profits that AFPs make even when the returns are negative or weak. Few people really understand how the system works and what their rights are. Among the many grievances that have given rise to the current protests in Chile, the private pension system is one of them" (November 2019).

Current president Sebastián Piñera submitted a bill in 2018 that would dramatically change the current system layout. Major proposed changes include "strengthening the social safety net for the elderly, supporting the middle class - particularly women - and increasing the size of pensions." Additionally, an important component is requiring employers to contribute 4% to their employees' pensions. The latter proposal would create a total of 14% mandatory contributions of wages to an employee's PRA before any additional contribution is made by the employee, in an effort to increase overall payouts.

Much time has been spent on debate over whether taxes or additional contributions should go towards funding solidarity (non-contributory) pensions. Regardless of the means of funding them, "they are deemed to be insufficient. The government said it will increase the size of solidarity pensions by 20%. In general, the government has been reactive, only acting when pressured by massive street protests" (Brown November 2019).

As of November 2019, the major protests currently ongoing in the country have led to "a landmark victory [for protesters]... as lawmakers agreed to hold a referendum on the nation's dictatorship-era constitution... the agreement, which calls for a plebiscite in April [2020], was signed after two intense days and nights of negotiations between opposing parties in the National Congress" (Krygier, 2019). Regardless of the 2019 movement's outcome, major changes are bound to take place in Chile in the near future. A key driver behind protester aggression is the current pension system, which is now expected to see serious revisions.

Positive takeaways

When compared to the original pay-as-you-go system that existed in Chile prior to 1980—as well as similar public pensions and social security funds worldwide—there are several key goals that the Chilean Pension Reform of 1980 sought to achieve that led to positive results.

The current system allows contributing workers to choose the risk allocation of their invested funds, compared to the government having full control over this choice. In addition, unlike the old system in which males had to reach the age of 65 and women had to reach the age of 60 before being eligible to receive benefits, the current system has no set minimum retirement age. As long as a person is able to accumulate a minimum value in their PRA, they can retire at the earliest age possible. Alternatively, they can continue to work however long they desire before being forced to take benefits. For those who are unable to reach the minimum pension threshold to retire, whether that was due to low contributions over time or poor investment returns, they are eligible for government subsidies up to a minimally deemed pension value.

While this may change in the future, the PRA system is currently fully employee funded, as the employer directly contributes 10% of employee wages to their PRA. In the Chilean labor environment, retirement benefits are universal from company to company and do not factor into hiring decisions.

This policy gives workers complete control of their future retirement savings as they freely transfer from job to job.

Additionally, unlike pay-as-you-go systems, the PRA system allows one to support their own retirement. Pay-as-you-go systems are in danger as the number of retirees grows faster than the working population who supports them and as retirees live longer into retirement. These problems create unfunded or underfunded pension liabilities, causing intergenerational conflict where young people wonder why they are supporting another generation's retirement instead of their own.

Finally, AFPs manage money extremely well. As was examined in the funds section, real profitability is in the 6-8% range for equity-weighted funds and in the 4-5% range for bond and fixed income funds over a 17 year time period (a 38 year period for Fund C). Additionally, since 1996 when foreign investments were included in equity portfolios to wane off domestic market reliance and chase higher gains, returns have remained steady while the funds have become more diversified. As can be seen in the fund analysis pie charts, the geographic breakdown of holdings has become more efficient, diversifying by expanding to more markets. However, this has not been relayed effectively to citizens, as is covered in the shortfalls section.

Shortfalls

While the Chilean PRA system is an improvement over the former pay-as-you-go system, there are still numerous shortfalls that make the system imperfect.

The Superintendency, tasked to regulate AFPs, has laws in place to enforce minimum rates of return; however, an AFP dissolution has never occurred under Law 3500. It is unclear exactly how the government would make up the difference if a significant market correction occurred that caused many or all of the AFPs to miss their minimums. According to Brown, "we know that no AFP has ever been dissolved because of poor returns. Proposals, such as prohibiting AFPs from charging fees for months when returns are negative, have been put forward.

It could become a reality; it has been part of discussions." It is unknown how the Superintendency would fund this gap, either through the Chilean government or other means [tax hikes]. What is known, however, is that nothing is set in stone, and the Superintendency is ill prepared to act on such a situation.

Flaws in the PRA system emerge when the market underperforms as well. Citizens are familiar with the profits AFPs make, regardless of fund performance. Additionally, AFP managers do not bear the same risk as PRA holders. AFP managers are incentivized to chase the highest possible returns, as higher returns would guarantee higher commissions. If the AFP manager makes a risky investment that does not materialize, the manager does not receive his or her commision, but the Chilean worker loses his or her retirement. A great risk tolerance mismatch exists between the two parties.

The AFP system was established with the intention of simulating a free market environment. This environment would spur competition among funds to provide individuals with more competitive service, management fees, and returns. The system currently has only seven AFPs, with AFP Modelo beginning operations in February of 2007, and AFP Uno beginning operations in October of 2019. Brown says, "there's no real general sense that there is corruption in that only 7 AFPs exist...the entry barriers to start an AFP in Chile are very high, however...for some time now there has been a high level of discontent among individuals because of the small pensions they [AFPs] tend to provide and the size of the fees the AFPs charge. " It appears the screening process is rather exclusive, and workers could benefit from a larger volume of AFPs in the system.

According to the July 2006 President's Pension Advisory Commission Report (Marcel Commission 2006), "the capitalization (privatized) system is geared toward workers with stable jobs who regularly contribute to an individual account for their entire working lives" (Kritzer, 2008). Thus, those who participate in the informal labor market, part time workers, or the temporarily unemployed, etc. cannot regularly contribute to their PRA as they have no formal full time

employment. This becomes a problem when calculating twenty years of full time labor service for solidarity pensions, as well as giving such workers access to AFP management services. Additionally, as of the 2006 report, just under 40% of workers were not covered by either the public or private pension systems. Figure 10below shows how PRA contributors have declined as a percent of the formal labor force from 1982-2007 (Kritzer, 2008).

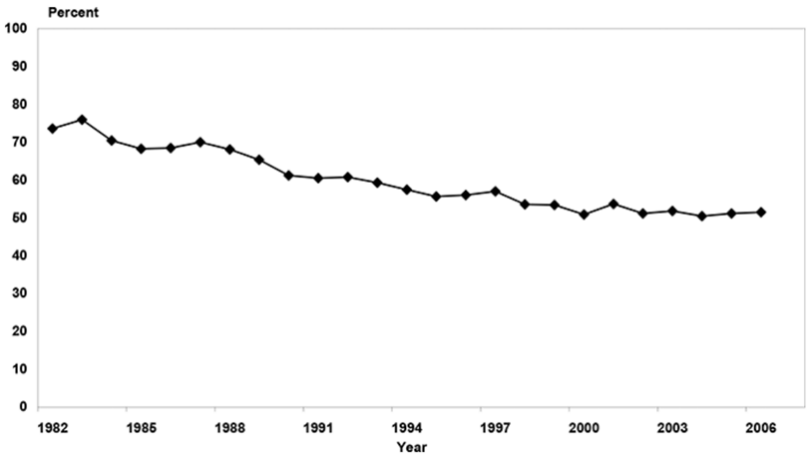


Figure 10. *Percentage of affiliates that contributed to their individual accounts, 1982-2007*

Several issues with the Superintendency hinder the progress of the PRA system as well. The way in which the Superintendency reports data makes it difficult for the average worker to digest. There are also few ways to contact the Superintendency, as there is no email on their website. This lack of transparency creates distrust between the people and authority as It is difficult to recreate or verify the figures published by the Superintendency.

The fact that many Chileans retire with low pensions is not principally linked to returns. As Allan Brown said in an interview, "...pension fund members in Chile are largely unaware that, over the past 17 years, returns have been pretty good on average...this comes down to the issue of financial education." *Encuesta de Previsión Social*, a survey conducted by

the University of Chile, questioned 24,000 individuals and found that under half of those surveyed were aware of the required monthly contribution and only 20 percent of those surveyed knew how many fund options existed. Additionally, only 50 percent of those surveyed were even aware of how much he or she had saved for retirement (Kritzer, 2008). A lack of financial literacy and general knowledge of the PRA system hinders the system's progress and effectiveness.

Conclusion

The purpose of this chapter is to analyze the PRA system and the reforms that have occurred over time in an effort to identify weaknesses, enhance strengths, and develop proposals for further reform. Accordingly, such analysis could potentially be used as a model for countries facing a pension crisis looking to change their existing systems. "Pension privatization policies, applied in the past in some countries, did not yield the expected results since the coverage and the benefits did not increase, the systemic risks fell on the people and the tax situation got worse. Consequently, several countries are reversing the privatization measures taken and restoring public systems based on solidarity" (Arenas de Mesa, 2019). Without proper reform, the future of the privatized pension system is in danger. It is clear that a privatized pension system is a superior option to a pay-as-you-go system in many instances, but the Chilean system should not be implemented elsewhere in its current form.

Instead of attempting to implement a new privatized pension system from scratch, it is encouraged to implement Chile's pension reform with the following modifications, as Chile's reform included a solid framework and a well-planned transition period.

The question of how minimum return rates will be met in the case of a significant market correction is still up for debate. But, it would benefit Chile and future systems to establish stronger insurance for such instances as the elimination of the AFP fluctuation funds essentially wiped out all of the AFP insurance policies in the case of poor returns.

As for competition, the Superintendency standards while noble, could benefit from some leniency adjustments. While still barring AFPs with poor finances and those that could be fraudulent from entering the system, lower barriers to entry would allow for the creation of more AFPs and benefit individuals with true competitive pricing and service. Other countries could adopt this AFP approval strategy from inception.

While the exact solution to the problem is not entirely clear, the fact that individuals with multiple part time jobs, temporary unemployment, or those that perform informal sector work are not accumulating contributions toward their PRA and years toward their labor timeline—because their situation is not viewed as being a part of the formal labor market—is problematic. While the simplicity of one vehicle for all retirement purposes is efficient, countries looking to make such a transition must keep people like these in mind and find a way to service them properly without leaving them uncovered.

Despite extensively perusing the Superintendence website during research, it is not easy to navigate or comprehend. Especially for the average worker trying to learn more about the system, it would benefit both parties to have clearer data presentation. For countries looking to transition, creating an easily navigable site would most likely cause less confusion for workers in the system.

A lack of financial literacy is a serious setback for a privatized pension system for two main reasons. A financial illiterate population is unable to comprehend PRA returns, positive or negative. Secondly, the effectiveness of the system is arguably irrelevant if workers do not understand the management or progress of their finances. An educational program must be established to teach workers about topics such as contributions, risk, diversification, and the options that exist under the privatized pension system.

The following pieces of the system have done well for Chile and should be similarly implemented in a future system.

The ability to invest a desired amount based on personal contributions and risk tolerance gives workers increased

autonomy and control over their retirement. Additionally, the PRA system gives workers increased freedom through the removal of the minimum retirement age and increased ease of job mobility.

The need for pension reform is not unique to Chile. Countries such as the United States, Brazil, and the Netherlands are on the verge of a pension system collapse. In France, much like Chile, citizens flood the streets protesting for pension reform. Now, more than ever, as unfunded pension liabilities continue to amount, it is important to consider the possibility of a privatized pension system becoming the new norm. It is because of the work of Dr. Piñera that future countries may now have this template for a successful privatized pension system.

Note: only published data and statistics were examined, as much of the data is unavailable for use. Some data may have been missing and, therefore, was not included in this paper. Using such data, if available elsewhere, might provide a more accurate detailing of the Chilean Pension System. The most important aspect of this paper was to highlight successes, identify weaknesses, and provide a comprehensive historical background.

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6 The time has come to permanently retire all our Caribbean currencies

DeLisle ***Worrell***

Introduction

Those of you who are fans of Netflix may have come across a mystery series entitled "Hinterland", which is set in the Welsh countryside. Several of the characters speak the Welsh language, *y Gymraeg*, and the series has a Welsh title, *Y Gwyll*. Had this series been issued only with its Welsh title, and had the Welsh dialogue not been subtitled, we would never have heard of it, and it would never have appeared on Netflix. Having your own native language is a source of pride, but if it is the only language you speak, your life chances are severely limited. In contrast, native English speakers in Trinidad or Barbados have unlimited possibilities for education, travel and migration, and an infinitely rich universe of information and communication.

Having your own currency is rather like having your own language: if our people only have access to Trinidad-Tobago dollars or Barbados dollars, there is very little economic activity of any kind that they can undertake. Even basic subsistence farming requires forks and hoes, which use metals that are not

found in these parts. The production of every product or service in the local economy involves the use of fuels and other imported inputs, which must ultimately be sourced in foreign currency. In addition, the great majority of consumer goods are imported, and those which are not, are produced with the use of imported inputs. If all we have is local currency, we can neither produce nor consume. Small modern economies are fuelled by foreign exchange: they can sustain the quality of life for residents only by maintaining the inflow of foreign currency; and they grow the economy by increasing the amount of foreign currency they earn or borrow.

Currencies served a crucial purpose when they were first introduced...

Why then do we have local currencies, if what matters for our wellbeing and increased prosperity is the US dollar, the euro or the renminbi yuan? To understand why we have local currencies, we need to go back in history, to a time when banking services were not widely available. Up until the 1960s in most Caribbean countries, all retail transactions and many wholesale transactions were settled with notes and coins. The means of payment were always scarce in those days, because our countries are so distant from the European capitals that issued the world's major currencies. Reports from the colonies of European nations in the Caribbean and elsewhere in the 17th, 18th and 19th centuries are replete with complaints about the shortage of the means of payment, and the stifling effects on commerce and industry (Armstrong, 2010). In the English Caribbean colonies, people were forced to resort to expedient measures: Spanish pesos were more readily available than English coins, but a single peso would frequently exceed the value of a prospective transaction. The custom arose of dividing the peso into eight equal segments. The "piece of eight" was in fact a Spanish peso that was valued at eight "bits".

The currency scarcity in the Caribbean was somewhat alleviated with the arrival of banking services in the 19th century (Bulmer-Thomas, 2012, p.139, 271). Payments could now be made by means of a written instruction to a bank. The cheque instructs the bank to make a deduction from the buyer's monies that had previously been deposited with them,

when the seller presents that instruction. It obviates the need for currency, for those with bank accounts.

But banks were few and far between, and most people did not have a bank account. They needed a secure payment instrument that could be used by anyone who did not have a bank deposit. In other words, a unit of currency. Currency notes were much cheaper to manufacture and transport than were coins, and, like cheques, they could be made in high denominations. A gold coin of equivalent value would be very much more expensive to store, transport and keep secure.

In the first half of the 20th century it became commonplace in countries of the British Empire to issue local currency notes and coins, with values fixed to Sterling (for the most part; the Bahamas and Bermuda were exceptions). These currencies were issued by special Government departments, termed Currency Boards. The Currency Board held an amount of Sterling with the Bank of England or with the British Crown Agents, and issued an equivalent amount of local currency. In this way the amount of the local currency issue could be more easily tailored to local needs. In the Caribbean there were Currency Boards covering the Lesser Antilles and British Guiana; Jamaica and the Caymans; the Bahamas; British Honduras (Belize) and Bermuda (IMF 1999a, 1999b).

Up until 1971, all currency values were fixed, and those values, including Sterling, were ultimately determined by the US dollar value of an ounce of gold. In such a system, local currencies played a vital role in providing a secure means of payment, one that had a known, dependable and unvarying value. Currency notes circulated widely in the population in the process of buying and selling, available to anyone who needed to make a payment of any kind. Apart from businesses and wealthy households, everyone used currency make payments.

In contrast, in today's world, few transactions of any consequence are settled with the use of notes and coins, and the issue of currency is typically a small proportion of the total money supply and transactions value in any modern economy. Most payments, however initiated, are settled electronically, and end with a computer record in the seller's bank that shows a deposit increase, and a computer record in the purchaser's

bank that shows a deposit loss or credit increase, of equivalent value. That is so whether the means of payment is an instruction sent from a computer, a credit or debit card, a cheque or any other means of payment, other than an exchange of notes and coins.

Up until 1971 the values of all Caribbean currencies were known and unchanging. The international economy of the time operated on what was referred to as a *de facto* US dollar standard. The US dollar, whose value was set by the Federal Reserve at 35 dollars per troy ounce of gold, was already the most widely used international currency. All other currencies, including Sterling, were priced in terms of US dollars. The British West Indian dollar, which was the currency in use in the Lesser Antilles and British Guyana until 1965, was issued by a Currency Board with headquarters in Port-of-Spain, at an unvarying value of BWI$4.80 to Sterling. Its value in US dollars was derived from the Sterling-US rate, which was changed only once in the post-1945 period, in 1967.

This system worked well, so long as currencies were anchored on a single universally used reference, the US dollar price of an ounce of gold. In this sense, the currency system resembled systems of weights and measures, such as kilometres or kilograms. However, the whole system of currency values fell apart when the US effectively moved off the Gold Standard at the time of the Smithsonian Agreement in December 1971 (Eichengreen, 2011). (The Agreement, between the G-10 nations, Belgium, Canada, France, Germany, Italy, Japan, the Netherlands, Sweden, the UK and the US, was for a change in the US dollar value of gold to 38 dollars, and there were several subsequent devaluations. In October 1976 reference to gold was removed from the definition of the dollar, long after it had ceased to be relevant.) For a time Caribbean currencies remained linked to Sterling, but most external transactions were in US dollars, particularly on the import side. This caused inflation locally every time Sterling depreciated against the US, and one by one the Caribbean currencies switched to a US dollar peg (Worrell, 1987, p.64, 104, 126).

...but domestic currencies are a nuisance in today's world

The world of commerce and finance today bears no resemblance to the world for which Caribbean currencies were devised. Currency notes and coin, mostly of uncertain value in terms of purchasing power of the everyday goods and services we need to source abroad, are little used domestically. Mostly we use electronic transfers, cheques and credit cards. Since these are all computer records, it is immaterial how they are denominated, so long as both ends of every transaction match. There is no reason to link the denomination of the electronic transactions to the value of notes and coins. We continue to do electronic payments in local currency only because we have not thought deeply about the problem. We refer to notes, coins and bank deposits as "money", and we use that term as a synonym for "currency". The proverbial man from Mars would find that perplexing: currency and bank deposits both may be used for making payments, but they are clearly two very different ways of making payments. Bank deposits may be precisely defined electronically; their value may be derived precisely from instructions about how the electronic record is to be read. That record may be rendered either as an amount of Trinidad-Tobago dollars, or an amount of US dollars or a multiple of TT dollars. That multiple is currently about 6.8, I believe. I can see no reason why that multiple should ever change, or why we should bother to define the electronic record in anything other than US dollars.

Notes and coins are another matter altogether. Jamaican currency can only be used to settle transactions in Jamaica. If the payee is in the US, the holder of Jamaican dollars must seek a supplier of US dollars who is willing to sell, and pay whatever is the going price. With the demise of the US dollar standard, there is no certainty about how that price may fluctuate. Experience with currencies of small countries worldwide shows that they all lose value over the long term, in some cases drastically so. Because the notes and coins lose value, there is no reason deposits should decline in value equivalently. Deposits with banks are matched with an equal or greater value of credit on the asset side of the balance sheet. They may therefore be denominated in US dollars rather than local

currency, so long as an equivalent amount of credit is simultaneously denominated in US dollars. Nothing changes.[1]

The problems of having your own currency

In the first place, there is little or nothing useful that you can do with an Eastern Caribbean dollar, in any community that does not have access to US dollars. You cannot find anything to buy, because there will be no imported goods of any kind, and also no local production, because there is nothing that is produced in the Eastern Caribbean that does not use some essential imported material or equipment. Equally, you will not be able to produce food for yourself, or make clothing or shelter, because there is no-one from whom you can purchase equipment and materials. Our economies prosper to the extent that there is an ample inflow of foreign currencies, which may be spent on the imports we consume and use in domestic production.

Companies and individuals who earn foreign currency are privileged, compared with those who are paid in local currency, in much the same way as Haitians who speak English are at an advantage, compared with those who only speak creole (*kreyol ayisyen*). Having your own currency gives a good feeling, but it actually makes second-class citizens of the less well-to-do.

Secondly, your local currency is not a good choice for placing your savings, because its value may be depreciated, relative to the US dollar, at the time when those savings are needed. Guyanese and Jamaicans who retired in the 1980s and 1990s found that the value of their pensions had shrunk to the point where they were entirely dependent on the charity of their offspring for their livelihood. Even in Belize, the ECCU and Barbados, where there has been no devaluation, people prefer to save in US dollars if they can, just in case. Local currency deposits and securities are an inferior option, which will be chosen only if you have no US dollars.

[1] Full dollarization for the Caribbean is not a new suggestion; it was first mooted for Jamaica in Hanke & Schuler (1995).

Thirdly, local currencies are in danger of devaluation whenever government's operating expenses exceed tax revenues for several years running. In these circumstances government accumulates unproductive debt, debt that does not contribute to the provision of communications, roads, ports, or lasting upgrades of health, educational and social services. Because Government's borrowing does not contribute to additional knowledge and capacity to earn foreign exchange, it does not generate a stream of revenues to service the loans contracted by Government. The result: in addition to meeting current import needs, some portion of the available supply of future foreign exchange must be set aside to service the new Government debt. That means less foreign exchange for current imports, and pressure for devaluation of the currency.

In practice, having a local currency has facilitated wasteful government spending and reduced the incentives for the reorganisation and modernisation of the public sector, throughout the Caribbean. In the absence of a local currency, Government would be obliged to maintain credit worthiness in order to borrow in US dollars. That would be an incentive to raise public sector productivity and resist the more egregious forms of pointless job creation. With its own currency, Government can make a great show of passing legislation for central bank independence, while continuing with policies that undermine the value of the currency.

The threat of domestic currency depreciation brings challenges that inhibit the country's economic development prospects. It undermines investor confidence, because prospective investors know that devaluation will be inflationary, and will trigger increases in import costs and unease and possible unrest in the labour force. Investment projects are put on hold until the threat of devaluation recedes. The threat of devaluation also leads to capital flight, as businesses and wealthy individuals switch to US dollar balances, pay off US dollar trade credits and borrow in local currency wherever they can.

Depreciation of the domestic currency worsens the distribution of income. Wealthy households have access to US dollars through a variety of channels. They may own or manage

international trading companies or financial institutions, they may have foreign clients, relatives or business associates, and they may have foreign sources of income. Their foreign income and income-earning assets protect them from the impact of currency depreciation. Public servants, persons employed in domestic activity and lower income earners are paid in local currency, and their avenues for converting to US dollars are limited. They cannot escape the inflation that comes with a devaluation of the local currency. Devaluation widens the gap between the haves, who can protect their income by switching to US dollars, and the have-nots, who are stuck with local currency which has lost some of its purchasing power.

There are no benefits to having your own currency

We are often told, by the IMF, journalists and commentators, that our countries may improve their competitiveness by devaluing the local currency.[2] Anyone who has taken a basic course in economics should know that that is erroneous. Small producers operate in competitive markets in which their contribution to the market is too small to make a difference to the ruling price in the market. At the ruling market price they may sell everything they produce, so why would they want to offer a lower price? In the case of tourism, minerals and other Caribbean products, prices are denominated in US dollars. What determines the return to the Caribbean producer is the quality of the product or service, a factor which is unaffected by the devaluation of the local currency. The argument that devaluation increases competitiveness is totally without merit, no matter how often it is repeated.

What is true is that devaluation reduces the wages of local workers, measured in US dollars. Hotels, restaurants and export activities become more profitable, at the expense of their workers. That does not seem to be a desirable outcome.

[2] This opinion persists even when other influences on competitiveness are acknowledged; see Varela & Lovo, 2016.

The IMF and mainstream media also regularly state that countries with their own currencies may limit the extent of domestic inflation, by raising domestic interest rates when prices rise beyond a target level. That is also clearly erroneous. The principal factors affecting domestic inflation are the prices of imports and the depreciation of the currency; domestic interest rates have no discernible effects on prices.

There are positive spinoffs of using the US dollar exclusively for local transactions

Government's fiscal indiscipline cannot erode the value of people's savings if there is no possibility of creating domestic credit to fund Government's deficit. Government borrowing from the central bank would be limited to the amount of deposits placed with central bank by commercial banks, and would be used to smooth out government's cash flow. Government finances would become subject to the discipline of the market. Government would be obliged to maintain a good international credit rating, and it would need to present careful and complete public documentation for projects for which it seeks funding. Public accounting for borrowings, including guarantees of the borrowing of state corporations, would be demanded by potential creditors, because they would be aware of the limits to Government's ability to borrow from the central bank.

Fears of devaluation, shortages of foreign currency, exchange controls and the bureaucracy that surrounds them would be a thing of the past. The boost to investor confidence, the positive impact on the commercial environment and the improvement in the ease of doing business, would be notable.

Exclusive use of US dollars would alleviate a major headache for the Caribbean and small countries around the world, namely the wholesale loss of correspondent relationships with international banks which deal in US dollars. The loss of correspondent banking relationships has inhibited remittances, turned away potential investment in international financial centres, and inconvenienced individuals who spend extended periods in the region and need to do business in local currency.

How to retire the local currency

The local currencies could be entirely redeemed by central banks by purchasing and importing US currency notes and coin, using their existing foreign reserve balances. Central banks and monetary authorities in the Caribbean all have foreign reserves sufficient to purchase US notes and coins to replace the full issue of local currency at prevailing exchange rates (See Table 1).

Table 1. *Currency Issue and Foreign Reserves, Local Currency*

Country	Currency Issue	Foreign Reserves	Date
Aruba, Fl.m	336	1636	Dec 2018
Bahamas, Bh$m	304	1182	Dec 2018
Barbados, Bd$m	732	991	Dec 2018
Belize, Bz$m	376	575	Jan 2019
Bermuda, Br$	124	154	Dec 2017
Curacao, St M. Gm	458	3140	Dec 2018
DR, Pesos, b	123	367	Dec 2018
Guyana G$b	106	112	Dec 2018
Haiti Gourdes, b	44	165	June 2018
Jamaica, J$b	94	400	Dec 2017
Suriname			
T'dad-Tobago, TT$b	8	53	Dec 2018

Sources: Central bank websites

All deposits and other liabilities of the banking system are held in digital records, and are matched by an equal amount of credit and other assets, also held in digital form. All that would be required for these balances is to covert both sides of the balance sheet from local currency to the US dollar equivalent at the prevailing exchange rate.

Objections that may be offered to full dollarisation

It is sometimes argued that in the absence of exchange controls the local economies would be denuded of investment or, conversely, overrun by foreign investment. In fact, investment is attracted to the Caribbean because of

competitive advantages and the prospect of profitability; the existence of exchange controls slows down potential investment inflows, and their removal would eliminate this obstacle. Some also argue that there would be danger of environmentally damaging or other inappropriate investment, or massive investments that may transform the landscape in socially undesirable ways. These dangers should be managed by planning, environmental and other legislation and regulation.

There is an objection raised that the US Federal Reserve would not approve of the domestic use of US dollars. The issue of Federal Reserve approval does not arise because the Caribbean central banks would have no authority to *issue* US currency. Caribbean central banks would continue to buy and sell US dollars from the Fed as they do now, as the local demand for currency varies. The Fed would continue to manage such US dollar assets as central banks might deposit with them from time to time. No change in the current arrangements is necessary.

The IMF frowns on the use of US dollars as the national currency. This would be a problem for countries such as Barbados which has a current IMF programme; the Barbadian Government would need to convince the Fund's Board of Directors of the merits of full dollarisation.

A problem would arise if the central bank lacks sufficient foreign currency to cover the outstanding currency with the banks and the public. In this case commercial banks might be willing to use their own foreign assets to retire their holdings of local currency. However, at the moment no Caribbean central bank is in this situation.

Dollarisation and national sovereignty

Retiring local currency is seen by uniformed observers as a surrender of economic sovereignty. [3] In fact, exactly the

[3] In private correspondence Hilbourne Watson explains that the notion that sovereignty empowers a country is the result of confusion about states, power and sovereignty: "This notion derives from reading international law in a linear way that fosters the impression that to be sovereign necessarily implies substantive equality, even though international law does not produce equality among states."

opposite is true: exclusive use of the US dollar enhances the range of choice open to the country and its residents, in all international commerce, because such transactions are conducted in US dollars or in currencies that are convertible to US dollars. In contrast, with Barbados dollars you cannot buy or sell anything in nearby St Lucia, much less in the rest of the world. In a world where payments and settlement are digitized, with no need for notes and coin, there is no limit on the commercial and financial sovereignty of holders of the US dollar.

It follows that the use of an independent local currency limits a country's sovereignty, because it limits the ability to engage in international commerce. The GDP of Barbados in 2018 was about US$5 billion, but the country had access to less than US$3 billion of international goods and services, because that was the total availability of US dollars and other foreign exchange from exports, tourism and other services, and foreign financial inflows. Once the economy is fully converted to US dollars and the local currency fully retired, the entire US$5 billion may be used to obtain the best value for money, in transactions anywhere in the world.

It is evident from Panamanian experience in the wake of the release of the "Panama Papers" that full dollarization does not safeguard a country against the risks in international commerce, including the reputational risks. Arguably, however, full dollarization mitigates the effects of adverse circumstances, and strengthens to country's resilience in the face of such events. Had Panama boasted its own currency, the release of the Panama Papers would undoubtedly have led to capital flight, major currency depreciation and a big jump in domestic inflation, all with long-term damage to economic growth prospects and economic stability. In the event, the economic damage was limited to the international financial services sector and services such as real estate which depended on that sector.

Experiences with full dollarisation

The Latin American and Caribbean region offers three examples of full dollarization: Panama, which has always used US dollars as local currency; Ecuador, which abandoned the

local currency in 2000; and El Salvador, which replaced local currency gradually, starting in 2002. Their growth and inflation performance since 1990, relative to the regional average, is shown in Figures 1 and 2.

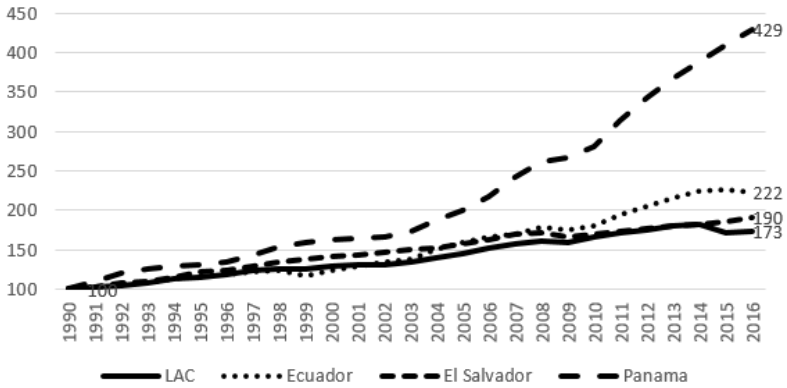

Figure 1. *Dollarised Countries- Growth Comparison*
Source: *ECLAC Annual Statistical Report 2017*

In Figure 1 we see that Panama's growth has significantly outrun that of Latin America and the Caribbean since 1990. At the end of 2016, Panama's annual GDP was over four times as large as it was in 1990, compared with the regional average, which was less than double. Panama's GDP rose faster that the regional average consistently over the past three decades. Ecuador and El Salvador also outperformed the regional average, but less spectacularly. In the case of Ecuador, in the earlier years when it still retained its own currency, growth was no better than average, but the growth rate accelerated past the regional average after full dollarization. In 2016 Ecuador's GDP was 222 percent of the 1990 figure, compared with the regional average of 173 percent. The relative growth of Salvadorean GDP shows no noticeable change during the period of full dollarization. The economy fell into recession five years later, but by 2016 it was slightly ahead of the regional average, at 190 percent of 1990 GDP.

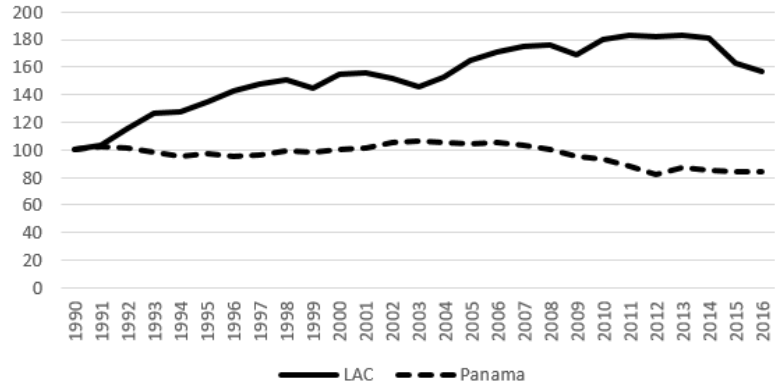

Figure 2a. *Inflation Comparison - Panama*
Source: ECLAC Annual Statistical Report 2017

Panama's inflation performance bettered the regional average by a wide margin (see Figure 2a). Relative to international prices, Panama's domestic prices in 2016 were only 84 percent of what they were in 1990. In the past decade domestic prices in Panama have risen more slowly than international prices, whereas for the region the slowdown of domestic prices is noticeable only in the last two years.

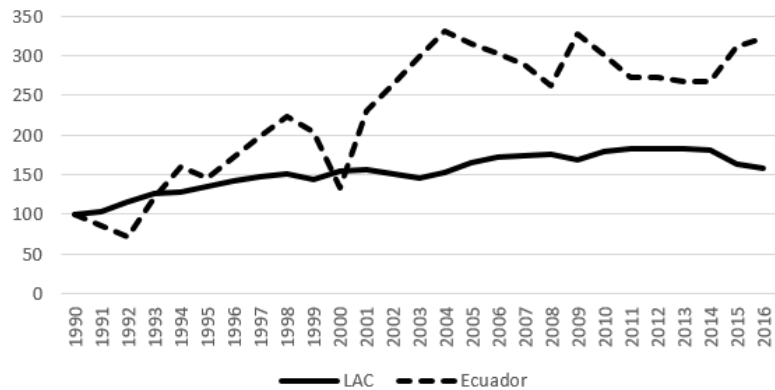

Figure 2b. *Inflation Comparison - Ecuador*
Source: ECLAC Annual Statistical Report 2017

In Ecuador, domestic prices rose much faster than international prices prior to full dollarisation (Figure 2b). Dollarisation in 2000 was accompanied by a sharp correction, which brought domestic prices in line with the regional average, but the effect was short lived, and relative prices more than doubled in the next three years. Since then domestic price increases have been in line with the regional average, though there have been wide fluctuations over the years. In El Salvador domestic price increases levelled off after full dollarization, ending the period very close to the regional average (Figure 2c).

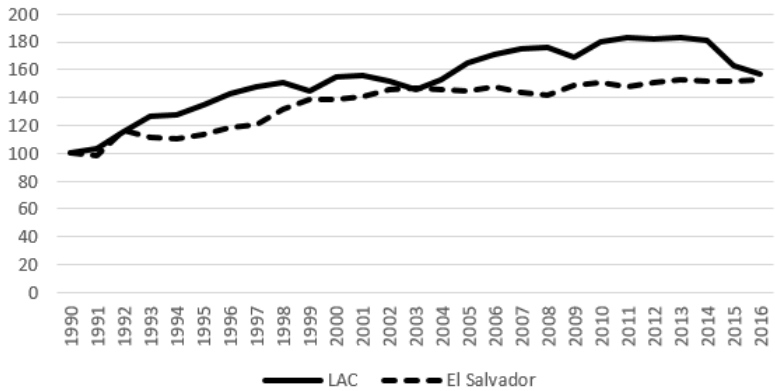

Figure 2c. *Inflation Comparison - El Salvador*
Source: ECLAC Annual Statistical Report 2017

These illustrations are not intended to demonstrate the benefits of full dollarisation. That would require an in-depth analysis of the circumstances of each country, taking account of economic structures and policies, and of international economic activity, among the many relevant issues which are beyond the scope of this essay. The growth and inflation data are intended only to allay fears about the possible adverse consequences of full dollarisation. However, the conclusion that dollarization appears to be beneficial is corroborated by others, including Hanke (2021).

The smaller the country, the more obvious the benefits of full dollarization seem to be. Steve Hanke (forthcoming) lists 37 small countries and territories that are fully dollarized:

American Samoa, Andorra, Bonaire, the British Virgin Islands, the Cocos (Keeling) Islands, the Cook Islands, Northern Cyprus, East Timor, Ecuador, El Salvador, Gaza, Greenland, Guam, Kiribati, Kosovo, Liechtenstein, the Marshall Islands, Micronesia, Montenegro, Monaco, Nauru, Niue, Norfolk Island, the Northern Mariana Islands, Palau, Panama, Pitcairn Island, Puerto Rico, San Marino, Tokelau, the Turks and Caicos Islands, Saba, Sint Eustatius, Tuvalu, the U.S. Virgin Islands, Vatican City, and the West Bank of Palestine. This list includes almost all the world's smallest economies.

Are the currencies of all small economies doomed to extinction?

The currencies which will have the longest life are those whose governments have consistently observed the Golden Rule: the government's expenditure on current operations and debt service should at all times be less than the revenues from taxation. In this way there is always a small surplus available to contribute to the replacement and modernization of equipment, property and infrastructure, and the entire amount of government borrowing is devoted to investment projects. Governments which observe the Golden Rule borrow from their central banks only to even out their cash flow, and amounts borrowed in advance of periodic tax returns are fully paid off with the receipt of the anticipated taxes. Central bank credit to government does not increase over time, and there is no pressure on foreign reserves, which can be maintained at a level sufficient to protect the exchange rate against a loss of value over the long term. For such governments the fact that their currency retains its value against the US dollar and other international trading currencies, and the adequacy of their foreign reserves, are easily identifiable markers of good financial management by government. A country with this reputation earns a high credit rating in international financial markets. The only remaining value of having your own currency, therefore, is as a signal that government is committed to sound financial management. When that is no longer the case, the currency will depreciate, and the process

of replacing it with US dollars will accelerate, beginning with the wealthiest in society. It then makes sense to retire the domestic currency in a quick and orderly process, rather than engage in a long and fruitless struggle to maintain its value.

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7 The curency boards of Trinidad (1906-1951) and Barbados (1938-1951)

Sidharth *Sah*

Introduction

Trinidad and Tobago existed under the monetary authority of one of two incarnations of a Board of Commissioners of Currency from 1906-1951. Some literature providing a monetary history of this time period does exist, notably including the Central Bank of Trinidad and Tobago's *History of Banking and Currency in Trinidad and Tobago* (1974) and Deryck Brown's *History of Money and Banking in Trinidad and Tobago From 1789-1989* (1989). Machine-readable statistics regarding the operations of the Board, however, are not readily available. We address this situation here with monthly (1906-1934) and semiannual (1935-1951) balance sheet data supplemented by Blue Book and Colonial Report data, although some gaps do exist. Based on certain statistical tests and an analysis of legislation, we conclude that the Trinidad Board of Commissioners of Currency acted as an orthodox currency board for the latter part of the period, though not all tests support this conclusion.

Similarly, Barbados had a Board of Commissioners of

Currency regulating its currency supply from 1938-1951. There is, again, some existing literature on the topic. The most comprehensive works are Ida Greaves's "Money and Currency in Barbados" (1952-1953) and Eric Armstrong's *A History of Money and Banking in Barbados, 1627-1973* (2010). This paper also provides spreadsheets of newly organized semiannual (1938-1951) spreadsheet data for the Board, with additional data from colonial annual reports and Blue Books (British colonial statistical yearbooks). Graphing the spreadsheet data and examining the legislation provides evidence that Barbados had a fairly rule-like currency board.

Background on the currencies of Trinidad and Barbados

From the 17th century until well into the 19th century, the currency arrangements of the West Indian colonies were a highly complex and disorganized amalgamation of whatever forms of coin were available. The predominant currencies of both Trinidad[1] and Barbados were Spanish and Portuguese coins, although other coins were used occasionally, including American and Dutch denominations. The rates of exchange between the various coins, including Spanish doubloons and Portuguese "Joes," varied highly between the different West Indian colonies and within each colony over time. This resulted in a highly volatile currency market in which certain denominations would fluctuate in intercolonial value, resulting in their sporadic disappearance and reappearance from common usage (Central Bank, 1974). One interesting example of the chaotic monetary situation of the West Indies was the usage of the shilling in Barbados. The shilling was used as a unit of account for the various other coins in circulation throughout the 1700s and 1800s, despite actual British shillings being almost nonexistent in the colony at the time. Once the shilling started circulating in Barbados in the mid 1800s, however, the actual coin had an entirely different value than the unit of

[1] In what follows, mentions of Trinidad include Tobago unless expressly noted.

account, until the two were assimilated by law in 1848 (Greaves, 1952-53: 59).

This variability in currencies caused several problems for Trinidad, Barbados, and the other West Indian colonies. A shortage of coin was a problem in many colonies, Barbados in particular. As early as the beginning of the 18th century, several measures to issue government currency were proposed and even passed by the Barbados legislature (Greaves, 1952-53). These attempts were in vain, however, as any such acts were quickly struck down by the British government, which had the last word on colonial monetary matters (Armstrong, 2010: 75-76). Instead, London took other short-term measures to address the issue. In the 1780s special copper coins were minted as Barbados pennies. A few decades later, as the currency shortage persisted, London issued a supply of silver based "Anchor Money" to the West Indies, primarily for the benefit of Barbados (Greaves, 1952-53: 13-14).

Banks began to fill the need for currency in the 1830s by issuing their own notes. Although colonies like Barbados had been attempting to issue their own currencies, the Colonial Office discouraged this, promoting bank note issue instead (Caine, 1950: 36). Thus, by the provisions of their charters, banks including the Colonial Bank and West India Bank began supplying notes in various West Indian colonies. Trinidad accepted bank note issue fairly easily, and, in 1906, passed legislation regulating the issuance of currency notes by banks. The 1906 Bank Notes Ordinance required any banks issuing currency to deposit an equivalent amount of money, in any form, to the "Bank Note Reserve Fund" (Brown, 1989: 100-101). Barbados, on the other hand, was initially quite skeptical of such notes, preferring the more established value of coins. A British Order in Council of 1838 helped alleviate the situation, fixing the value of bank-issued dollars in terms of pounds sterling. This allowed the Barbados public to grow to trust bank notes over time (Greaves, 1952-53: 55). By the early 1900s, bank issued notes were commonly used in both colonies.

Discussion of a unified Caribbean currency board to issue official government notes began in 1923 with an inter-colonial conference. Such an arrangement was considered desirable to

compensate for currency shortages and to enable a stable, consistent means of exchange between the colonies (Central Bank, 1974: 22-24). Moreover, having a dominant paper currency with a fixed exchange rate would make the currency market more stable (Greaves, 1953: 14). Unfortunately, the prospect of establishing such an authority across all West Indian colonies was unrealistic at the time. The cost of recalling all British sterling coins in the various colonies, the necessity of discontinuing bank note issue, and the need to align the varying interests of the different colonial governments were all substantial barriers to the establishment of a unified currency board (Caine, 1950: 36-37).

Nonetheless, currency boards arose independently in some of the West Indian colonies, including Trinidad and Barbados. The Government Currency Notes Ordinance of 1904, in Trinidad, established a Board of Commissioners of Currency, which had the authority to issue notes, and was required to have reserves, in any legal Trinidadian currency, of equal value to total note issue. The Board consisted of the Colonial Secretary, Colonial Receiver-General, and a third member nominated by the governor. The Board actually commenced operations in 1906 with the passage of the Government Currency Notes Regulations of 1906. Another act, the Government Currency Notes Ordinance of 1934, updated the board to require that the reserves be held in pounds sterling, eliminating the need to hold some reserves in gold or silver coin. The new Board of Commissioners of Currency would still consist of three members: the Colonial Secretary, Colonial Treasurer, and another person to be nominated by the governor. A nearly identical act, the Government Currency Notes Act of 1937, established an extremely similar situation in Barbados. The Barbados Board was likewise chaired by its own Colonial Secretary, Colonial Treasurer, and another person nominated by the governor.

Thus for some years, the British West Indies were supplied with currency by three currency boards, those of Trinidad and Tobago, Barbados, and British Guiana. (The British Guiana board is not discussed in this paper. Farther away, British Honduras, Jamaica, and the Bahamas also had currency boards,

but they were not considered part of the region.) The idea of a united Caribbean currency board, however, had never gone away. A West Indian conference was held in May 1946 to discuss the prospect, attended by representatives from Barbados, Trinidad and Tobago, Antigua, St. Kitts and Montserrat, St. Lucia, Dominica, Grenada, and British Guiana. By this time, many of the technical barriers that had prevented a unified board had solved themselves. The disorganized monetary landscape of the West Indies had largely simplified to the usage of government issued notes from the three West Indian currency boards. The notes issued by these boards also all had equivalent and stable rates of exchange with the pound sterling (Caine, 1950: 37). Accordingly, an agreement was reached by all of the colonies that had attended the conference in March 1948 to move forward with plans to institute the unified board. Trinidad and Tobago legally consented to this arrangement in Ordinance No. 39 of 1950 (Brown, 1989: 159). Barbados did the same with the Currency Act of 1950 (Krus & Schuler, 2014: 23). The other participating territories followed suit, and the British Caribbean Currency Board commenced operations in 1951, ending the active roles of Trinidad's and Barbados's Boards of Commissioners of Currency (Central Bank, 1974: 28-30).

Currency board orthodoxy: Legislative perspective

An orthodox currency board operates within the restrictions of a few critical principles. By definition, currency boards maintain a fixed exchange rate with their anchor currency; in the cases of Trinidad and Barbados, the anchor was the pound sterling. In order to maintain this exchange rate, currency boards maintain reserves in the backing currency equivalent to at least 100 percent of their circulating currency, though they typically hold slightly more than 100 percent to provide a buffer against asset depreciation. Additionally, one of the key advantages of the currency board system is that they typically accumulate seigniorage, equal to the interest generated on reserves less the operating expenses of the board (Hanke &

Schuler, 2015 [1994]: 7). Given this definition, the legislation enacting the two currency boards can be assessed for their faithfulness to the currency board system.

Trinidad's Government Currency Notes Ordinance of 1904 established a Board of Commissioners of Currency, but despite the suggestion implied in its name, it was not required to be an orthodox currency board. The Ordinance never explicitly specified a fixed rate of exchange with sterling or any other currency. Of course, "dollars" in the West Indies had a specified value, at four shillings and two pence as per a British Order in Council of 1838 (Greaves, 1952-53: 55). More damning, at least in principle, was the nature of the reserves established by the law. The Board was required to keep a "Note Guarantee Fund" of equivalent value to the currency in circulation. This fund, however, could be kept in any form of legal tender accepted in Trinidad (Central Bank, 1974: 23). An orthodox currency board law would require the reserves to be kept in the backing currency. In practice, though, the Board does not appear to have held significant domestic assets.

Trinidad's revised Board of Commissioners of Currency, as established in the Government Currency Notes Ordinance of 1934, had a legal form nearly identical to Barbados's Board of Commissioners of Currency, as established in the Barbados Government Currency Notes Act of 1937. Their similarity reflects an effort by the British Colonial Office to revise and standardize legislation applying to colonial currency boards. Revisions eliminated references in older legislation requiring currency boards to hold gold or silver coin as reserves, considered obsolete given that Britain had abandoned the gold standard in 1931. Assets formerly held in coin were now permitted to be invested in interest-earning securities. The only differences between the texts of the 1930s Trinidad and Barbados ordinances are references to specific locations, such as the Boards' headquarters, and a few provisions in the Trinidadian legislation to cover the transition from the first to the second currency board system. As such, the two currency boards can be assessed simultaneously.

Both pieces of legislation declare that the board will issue notes of an equivalent value for any sterling lodged with them

or with the Crown Agents[2] in London, at a fixed exchange rate of one dollar to four shillings and two pence. Likewise, the legislation provides that the reverse transaction, exchanging notes for sterling, would also be honored at the same rate. Particularly, any sterling provided in exchange for notes was to be charged out of a "Note Security Fund" (both colonies used the same name for this account). The acts include a stipulation that all notes issued would require an equivalent amount of sterling to be paid into the Funds. This implies constant backing reserves that are at least 100 percent of the currency boards' note issue, satisfying the reserve requirement.

These Note Security Funds were managed by the Crown Agents, who were allowed to invest portions of them in various securities, under the discretion of the British Secretary of State for the Colonies. The income generated from such investment was directed into a "Currency Note Income Account" (again, both colonies had the same name for the account). Any expenses incurred by the currency boards were to be drawn from these same accounts. One percent of the values of the Note Security Funds was also to be charged from those accounts to be directed into the Funds once per year. At the end of each year, any money left in the Accounts was then "transferred to the General Revenue of the Island," thereby allowing for the generation of seigniorage revenues.

By meeting the fixed exchange rate and reserve criteria, while also providing for seigniorage revenue accumulation, the Trinidad Board of Commissioners of Currency after 1937 and the Barbados Board were both highly orthodox currency boards, at least by the letter of the law.

Differences in board operations

Thus, the two currency boards were virtually identical in their legal structures. Nevertheless, in their actual operations, they varied in a few ways worth mentioning. For one thing, notes issued by the Trinidad and Tobago Board of

[2] The Crown Agents for the Colonies, a British government body offering asset management and other services.

Commissioners of Currency were legal tender in the Windward Islands, Dominica, St. Lucia, and Grenada, as well as the Leeward Islands, Antigua and St. Kitts and Montserrat. This arrangement was in place from the beginning of operations of the board (Greaves, 1952-53: 65). Additionally, the growth in notes in circulation issued by Trinidad's board, as well as British Guiana's board, outpaced that of Barbados's board after 1940. The result of this was that from 1946-1949, there were nearly as many Trinidad and British Guiana notes circulating in Barbados as Barbados notes. On the other hand, there was no substantial circulation of Barbados notes in the other two colonies (Greaves, 1952-53: 66; Armstrong, 2010: 94). These two points together indicate that Trinidad's board had a substantially greater influence throughout the entire West Indies than did Barbados's. It is perhaps for this reason that the united British Caribbean Currency Board, once established, was headquartered in Trinidad. Trinidad was as well the most populous of the colonies the united board served.

The data

We transcribed monthly or semiannual balance sheet data for the Trinidad and Tobago Commissioners of Currency from the *Trinidad Royal Gazette* from June 1906 to June 1951. Many of the statements are missing, as mentioned below or more extensively listed in the companion spreadsheets. Semiannual statements for the Barbados Board of Commissioners of Currency were also transcribed from November 1938 to March 1951 from the *Barbados Official Gazette*. Data are missing for the period from March 1943 to March 1944. In both cases, any missing data appear to have either not been published by the respective periodical or were not available at the Library of Congress, the source of the publications. Additional data from the Colonial Statistical Abstract and Barbados Blue Books was consulted and used in certain calculations.

Currency board orthodoxy: Data analysis

Utilizing the available balance sheet data for the currency boards of Trinidad and Barbados, the first test we perform to

assess their level of orthodoxy is a comparison of total assets to the currency in circulation. An orthodox currency board will hold reserves of at least 100 percent of liabilities, here being the notes in circulation. Figure 1 displays the total assets of the Trinidad and Tobago Board of Commissioners of Currency as a percentage of the notes in circulation. Figure 1 is "continuous," omitting missing data from 1924, 1928, December 1937, June 1938, December 1941, June 1942, December 1944, 1946, December 1947, and December 1948. (The accompanying spreadsheet workbook contains a "discrete" version of the data showing where data are missing. The workbook also contains similar graphs for other data shown here only in their continuous version.) As the graphs show, the Board maintained assets at a level of approximately 100 percent for the majority of its operations. With a few exceptions, most semiannual statements show the Board having assets of value between 90 and 128 percent of the notes in circulation. There was a fairly prolonged period, from December 1913 to December 1920, when reserves remained below 100 percent. However, even in this time, the percentage of assets to circulating currency remained above 90 percent. Thus, this does not represent a substantial deviation from conventional operations.

When focusing only on the period in which the Trinidad and Tobago Board had the full legal framework of a true currency board, from 1935 to 1951, the data are even more convincing. In this period, our calculations show that the Board held assets strictly equal to between 93 and 127 percent of their notes issued. This would indicate decidedly orthodox behavior. Figure 2 presents data for total assets as a percentage of currency in circulation for the operations of the Board after the Government Currency Notes Ordinance of 1934.

Based on this same test, Barbados's Board of Commissioners of Currency also maintained a fairly strict adherence to the regulations regarding reserve backing of note issue. With only one exception, the semiannual statements for the board throughout its entire period of operations show assets having value between 96 and 110 percent of currency in circulation. The one exception, moreover, consists of one statement from March 1945 in which assets had 167 percent of the value of

currency in circulation; having assets in fairly large excess of liabilities is not as heretical to the currency board system as having too few assets.

Thus, by this metric, Barbados's currency board appears to have followed currency board conventions quite well. The data for assets as a percentage of currency in circulation can be seen in Figure 2, which like Figure 1 is continuous, omitting missing observations from March 1942 to March 1943.

The Barbados board seems to have held no domestic assets, while the Trinidad board held none until 1934. After a spike in 1935 and 1935 (related to selling off its gold and silver coin reserves?), its holdings were in low single digits as a share of assets (see spreadsheets).

While these tests suggest that both boards were fairly orthodox in nature, another test, reserve pass-through, differs. Reserve pass-through tracks changes in the monetary base in proportion to changes in net foreign assets. An ideal currency board will match any change in monetary base exactly with an identical change in foreign assets held. Thus, a perfect currency board will maintain reserve pass-throughs of 100 percent (Hanke, 2008: 57-58).

When performing the reserve pass-through test for Trinidad's board, the results are initially quite concerning. When looking at the entire period of 1906-1951, the results (Figure 3) show a great deal of volatility. When the scope of the data is limited to the period after 1934, however, when the Board of Commissioners of Currency began to act as a typical currency board, the graphs stabilize substantially. The reserve pass-through rate appears to hover fairly consistently around 100 percent. There is still some variability, however, at the beginning and end of the period. These fluctuations suggest some degree of unorthodoxy.

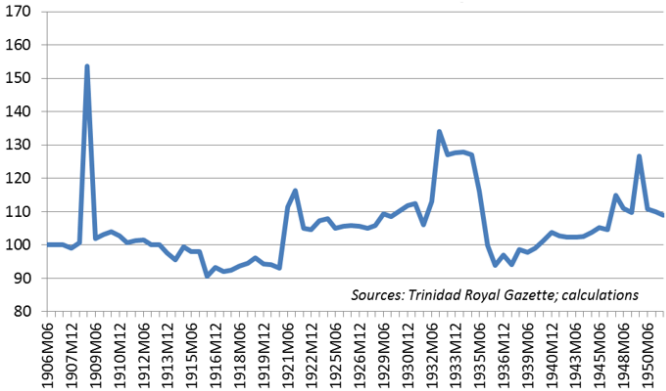

Figure 1. *Trinidad: Total assets as % of currency in circulation (continuous)*

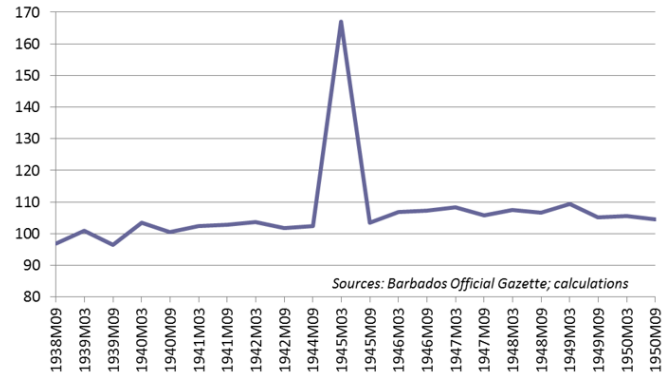

Figure 2. *Barbados: Total assets as % of currency in circulation (continuous)*

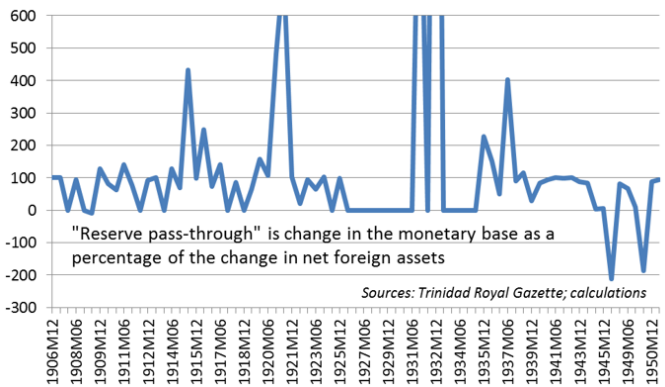

Figure 3. *Trinidad: Reserve pass-throught (%, continuous)*

Reserve pass-through data as calculated for Barbados show many large fluctuations, implying extensive divergences from proper currency board behavior (Figure 4). These graphs are somewhat misleading, however. Much of the volatility can be attributed to statements in which the value of currency in circulation did not change from the last statement. By the nature of the calculation, the reserve pass-through calculated for these statements will be 0 percent, regardless of the magnitude of change in foreign assets held. Thus, all such cases will graphically appear to be major deviations from the 100 percent indicative of orthodoxy. In order to correct for this, Figure 5 presents data for reserve pass-through excluding any statements that did not record a change in notes in circulation. Thus, the data for changes in both currency in circulation and net foreign assets are "stretched" across any semi-annual statements that could not be used. When looking at this chart, the Barbados currency board seems to have been relatively rule-like, with the reserve pass through percentage staying quite close to 100 for the majority of the period. For the most part, the reserve pass-through ratio remains between 92 and 120 percent. There is still a fairly serious period of fluctuation, however, between 1944 and 1946. The calculation of reserve pass-through from September 1944 to September 1946 yields a value of 40 percent, quite off from 100 percent. Moreover, the data shown in Figure 13 is quite limited due to the omission of semi-annual statements that were either unavailable or did not record a change in currency circulation. Only 9 out of 25 possible pass-through calculations are displayed. Thus, although the data is promising for Barbados's board's orthodoxy, the statistical deviation from 1944 to 1946 and the patchiness of the pass-through data prevent a conclusive statement.

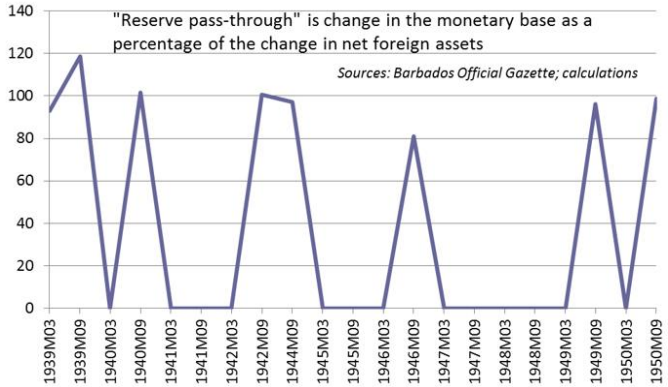

Figure 4. *Barbados: Reserve pass-throught (%, continuous)*

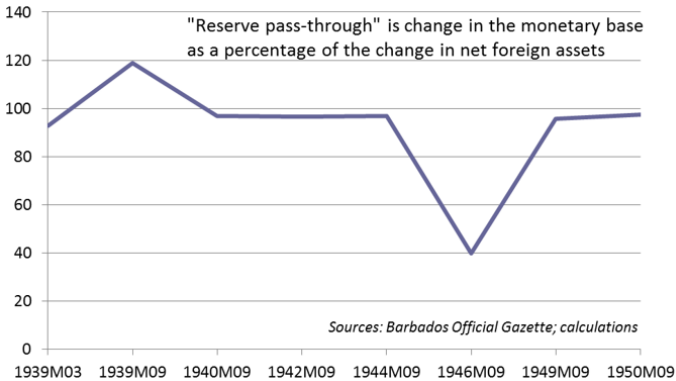

Figure 5. *Barbados: Reserve pass-throught (%, "stretched")*

Board operations: Revenue generation

This paper is not intended to offer extensive analysis of the effects of Trinidad's and Barbados's currency boards on their wider economies. Nonetheless, we did some tests to observe a few of the possible effects the boards may have had upon their colonies. The generation of seigniorage revenue, for instance, was one of the defining characteristics of a currency board identified earlier in the paper.

Figure 6 depicts the total revenues, total expenses, and net revenues of the Barbados Board of Commissioners of Currency from 1939 to 1946, the majority of its period of operations, though unfortunately lacking the period from March 1942 to

March 1943, for which data are missing. As can be seen from the green line representing net seigniorage, the Board did create positive profits every year, except for the very first one. It is understandable that the first year of operations may have been less profitable, as it would likely have faced substantial expenses associated with setting up and commencing currency distribution. The seigniorage revenues, although positive, are small in most years. Particularly towards the end of the observed period, the net revenue is trending towards about 1 percent of the Board's assets. This point is not necessarily unfavorable towards the Barbados currency board, however, as it can be partially explained by British government policy. In the early 1940s the British Colonial Office promoted various wartime policies among colonies' currency boards. One policy that was implemented in 1943 throughout the West Indies was to minimize the commission charged by currency boards for the issue and redemption of currency. Indeed, the Colonial Office specifically suggested that profits should be close to nothing in order to reduce the cost of exchange for the public (Armstrong, 2010: 98). Thus, although the seigniorage from the Board was small, this is not representative of the typical operations of the Board.

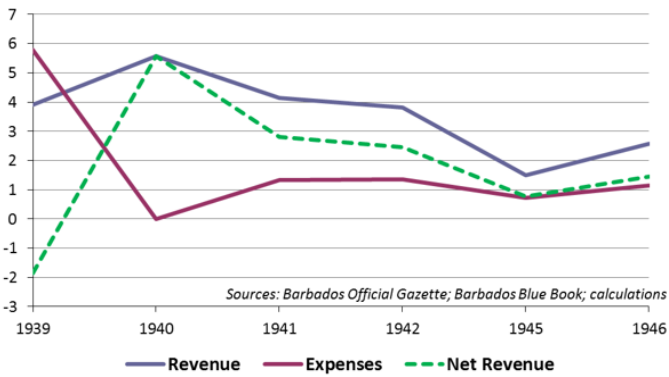

Figure 6. *Barbados: Revenue and expenditures (% of board assets, continuous)*

We were unable to conduct the same study for Trinidad and Tobago, as their revenue and expense figures were not available

in the Trinidad and Tobago Blue Books. Future study would benefit from locating these numbers if they are available.

Board operations: Balance of trade

Another measure we looked at regarding the possible influence of the currency boards was the balance of trade. Currency boards, and fixed exchange rate systems in general, have sometimes been criticized for the negative influences they are purported to have on the balance of trade. Economic theory, for instance, asserts that the inflexibility of the rate of exchange prevents natural adjustments in currency value that serve to correct for trade deficits (Suranovic, 2008: 504). On the other hand, critics of the British network of sterling-backed currencies argued that the restrictions on the usage of sterling prevented colonies from spending their income on imports (Hazelwood, 1954: 295).

In order to check for any adverse effects, Figures 7 and 8 chart the balances of trade of Trinidad and Tobago and Barbados respectively. Trinidad sees a somewhat volatile balance, generally remaining within £600,000 above or below zero until 1937. From then on, the balance becomes strongly negative and remains so until 1951, the end of the plotted period. Interestingly, this plunge in the balance comes just a few years after 1934, when Trinidad adjusted its legislation to have a more orthodox currency board. This could possibly lend some credence to the notion that currency boards can exasperate trade deficits. This finding cannot be held at face value, however, as any economic figures in the late 1930's and early 1940's will inevitably be confounded by the Great Depression and World War II. The Depression, for example, did cause a documented decline in U.S. imports of goods like sugar and cocoa that were key to the Trinidadian economy (Brown, 1989: 123-124). As such, the trade deficit cannot reliably be linked with the operations of the currency board.

Barbados, on the other hand, has a deficit over the entire era charted, from 1938 to 1946. This, again, could potentially indicate that the board prevented Barbados's economy from naturally correcting its deficit. Of course, the existence of

either the Depression or World War II through this whole time period again reduces the significance of this trend. On the other hand, the exact magnitude of the trade deficit remains very stable until 1946, never leaving the range of £400,000 to £905,000 in the negative before that year. This suggests that the Board did not cause the deficit to get worse, as the balance does not fall significantly after the imposition of the Board of Commissioners of Currency in 1938.

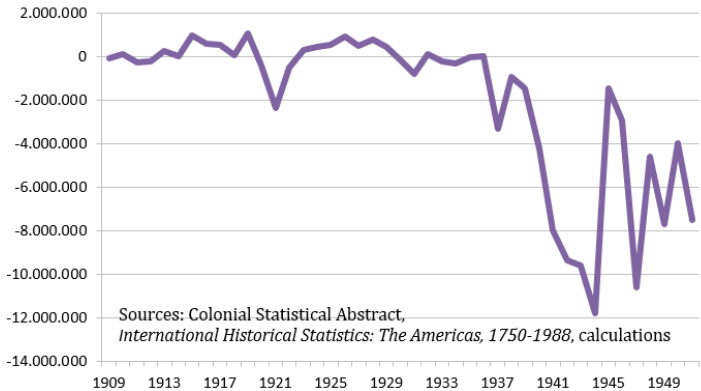

Figure 7. *Balance of trade (£)*

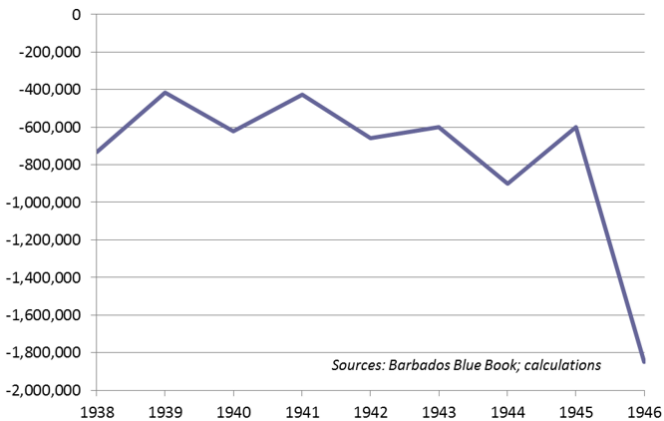

Figure 8. *Barbados: Trade balance (£)*

Conclusion

Final assessment of the degree of orthodoxy of the currency boards of Trinidad and Tobago and Barbados remains inconclusive. The original Trinidad Board of Commissioners of Currency, based on the Government Currency Notes Ordinance of 1904 was unorthodox in legislation if not in practice. The legislation did not set a fixed exchange rate or provide for reserve backing in an anchor currency. The changes brought by the Government Currency Notes Ordinance of 1934 fixed these issues, setting a rate of exchange and including a provision for at least 100 percent reserves in an anchor currency, the pound sterling. The legal framework of the board can therefore be considered orthodox after 1934. The Barbados Board of Commissioners of Currency, formed by the Government Currency Notes Act of 1937, being nearly identical in structure to the Trinidad Board after 1934, can similarly be deemed orthodox, on paper.

Comparison of total assets held to currency in circulation, moreover, suggests orthodox currency board behavior. Between 1935 and 1951, Trinidad maintained assets equivalent to between 93 and 127 percent of total note issue. Barbados, over the entire course of its operations, held assets of between 96 and 110 percent of currency in circulation. In both cases, assets were consistently maintained at a level close to 100 percent.

The Barbados board apparently held no domestic assets, while the Trinidad board held none before 1934, then, after a spike in 1935 and 1935 (related to selling off its gold and silver coin reserves?), its holdings were in low single digits as a share of assets. These figures again suggest orthodoxy.

Reserve pass-through, provides doubt in the case of Trinidad. Volatility in this metric for the Trinidad board raises the possibility of unorthodoxy. Further evaluation of the data may help clarify whether or not Trinidad's Commissioners of Currency engaged in unorthodox behavior, or if the test is somehow misleading or not a good evaluator of orthodoxy in this case.

Barbados, on the other hand, has a relatively stable reserve pass-through, providing further evidence that their board conformed to the principles of a currency board. Unfortunately, their reserve pass through is not quite perfectly stable, and the calculation that demonstrates stability requires the exclusion of a large portion of the data. Thus, although Barbados's board appears to have been orthodox from all angles, a definitive verdict cannot yet be formed. Another approach to the reserve pass-through test may be helpful in further assessing Barbados's situation.

For both colonies, there are at least some gaps in the consulted data. While they are likely not substantial enough to cause major problems in the data analysis, further studies would benefit from acquiring these missing pieces.

As far as the effects these boards had, findings were limited. Barbados's board did generate profits, but not very substantial ones. The limited seigniorage was likely by design, however, due to the wartime measures of the Colonial Office. Repeating this test for Trinidad would allow for a more complete evaluation of currency boards' ability to create profit for their governments. Evaluating the balances of trade for both colonies does provide some evidence that currency boards may help maintain or even worsen trade deficits. These findings have limited value, unfortunately, as they are influenced by the occurrence of the Great Depression and World War II in the period assessed.

Postscript:
Companion Spreadsheet Workbook

The data, calculations, and original versions of the graphs used in this paper can be found in the companion spreadsheet workbooks. The workbooks also contain a significant amount of data not used in this paper.

Appendix

A. Summary Legislative History of Trinidad Note Issue, 1903-1950

The below is a collection of pieces of legislation related to note issue in Trinidad and Tobago from 1903 to 1951 along with brief descriptions of each law.

- Government Currency Notes Ordinance, No. 16, 1903: Established legal framework for government note issue.
- Bank Notes Ordinance, No. 243, 1904: Regulations regarding bank note issue.
- Government Currency Notes Ordinance, No. 244, 1904: Established the initial Board of Commissioners of Currency.
- Government Currency Notes Ordinance, No. 4, 1905: Repealed a regulation in Government Currency Notes Ordinance of 1903 requiring a publication in the government gazette of any alteration in regulations.
- Government Currency Notes Regulations, 1906: Prescribed regulations regarding Government Currency Notes Ordinance, No. 244 of 1904, and established the Commissioners of Currency.
- Currency Interpretation Ordinance, No. 23, 1934: Established that prior legislation mentioning pounds, shillings, or pence will now have effect with regards to dollars and cents at the rates of $4.80 per pound, $.24 per shilling, and $.02 per pence.
- Government Currency Notes Ordinance, No. 40, 1934: Repealed 1903 Ordinance and established the revised Board of Commissioners of Currency.
- British Caribbean Currency Agreement, 1950: Establishes a unified British Caribbean Currency Board.
- Ordinance, No. 39, 1950: Granted Trinidadian government consent to discontinue operations of the Trinidad and Tobago Board of Commissioners of Currency and join the British Caribbean Currency Board.

B. Summary Legislative History of Barbados Note Issue, 1937-1950

The below is a collection of pieces of legislation related to note issue in Barbados from 1938 to 1951 along with brief descriptions of each law.

- Government Currency Notes Act, No. 12, 1937: Established the Board of Commissioners of Currency.
- Government Currency Regulations, 1938: Provided some regulations of the 1937 Government Currency Notes Act of 1937.
- British Caribbean Currency Agreement, 1950: Established unified British Caribbean Currency Board.
- Currency Act, 1950: Discontinued Barbados government note issue and provided the Barbados government's consent to join the British Caribbean Currency Board.

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8 An economic analysis of the Bahamas currency

Philip ***Prokos***

Introduction

Before delving into the analysis of the Bahamas currency board, it is useful to discuss the general history of currency boards, along with a brief timeline of the Bahamas and a description of the Bahamas currency board's functions. The first instance of a currency board can be traced back to 1849 in the British colony of Mauritius. Currency boards became widely used in British colonies in the 1900s and were also established elsewhere, such as the French colony of Djibouti. Over seventy countries have had currency boards. The table below shows a list of currency board (or similar) systems in operation in recent years (Hanke, 2002).

Table 1. *Currency boards 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

Source: Hanke (2002).

Description of a currency board

A currency board is a monetary authority that guarantees a fixed exchange rate to a foreign currency (also called the anchor currency). This is done through a system of holding foreign assets equal to (usually greater than) the coins or notes supplied by the authority. In an orthodox currency board, foreign reserves are equal to 100 percent or slightly more of the total amount of the currency board's monetary liabilities in circulation—notes, coins if any, and demand deposits, if any. The foreign reserves are usually a mix of foreign currency, high-quality foreign bonds, and other low-risk assets. Anyone who would like to convert local currency into the anchor currency should be able to do so on demand. For instance, in the case of the Bahamas before 1968, any person could convert notes of the Bahamas currency board into pounds sterling at any time. This process can also go in reverse; foreign assets can be converted into local currency. The supply of the high-powered base money in a currency board system is determined purely by market demand—unlike the case with central banks, which frequently engage in discretionary monetary policy.

Commercial banks play a large role in the financial system of a currency board because they often hold substantial foreign assets, and a limited quantity of local currency notes, in their own reserves (in addition to being required to deposit a minimum reserve in the currency board in some cases). Banks attempt to estimate how much local currency they should hold

based on how much customers will withdraw in the near future. If the commercial banks believe they will need more local notes, they request them from the currency board and exchange foreign assets for the local notes.

As an aside, the currency board of the Bahamas worked slightly different than many other currency boards. Instead of holding all the foreign asset reserves in a central location, clearing banks had their own supply of foreign assets and would provide Bahamian notes on demand. When the clearing bank needed notes, it requested it from the Commissioner of Currency and transferred foreign assets for the domestic notes. The Crown Agents for the Colonies in London would then credit the sterling account of the Commissioner of Currency and, in turn, provide sterling notes (Rabushka, 2010). The Bahamas Commissioners of Currency initially charged no fee. They were allowed to charge a fee of up to 1 percent in legislation of 1936 discussed below, although it is unclear what their actual fee was.

A currency board earns revenue through the interest on the reserve assets it holds (In the mixture of assets described above, at least the securities pay interest. Bank deposits sometimes have and other times have not). On average, expenses in a functioning currency board should not exceed one percent of total assets. These expenses are mainly from the printing of notes, creation of coins, and from salaries or other maintenance fees. The profit is therefore the interest earned on reserves minus the liability maintenance expenses (The description of a currency board was drawn mainly from Rabushka (2010) and Hanke (2002)).

Summary of features of an orthodox currency board

Issues notes and coins which are fully convertible at a fixed exchange rate into a foreign anchor currency.

1. Reserves consist of low-risk, high-quality foreign assets such as top-rated securities.
2. Profit is a result of difference between interest earned on reserve assets and expenses.

3. Reserves are equal to or somewhat greater than 100 percent of the currency board's monetary liabilities—local notes and coins in circulation plus demand deposits at the board, if any.
4. Does not engage in discretionary monetary policy (Hanke & Schuler, 1993).

Currency board compared with central bank

Most economists favor central banking over other monetary authorities because of the latitude for discretionary policy that central banks offer. Some important functions of a central bank include the power to affect money supply by changing its policy interest rate or the reserve requirements imposed on commercial banks, to be a lender of last resort to commercial banks, to play a central role in the clearing system, and to be a lender and fiscal and economic advisor to the government.

Table 2. *Summarizes the key differences between a currency board and central bank*

Typical Currency Board	Typical Central Bank
Usually supplies notes and coins only	Supplies notes, coins, and deposits
Fixed exchange rate with reserve currency	Pegged or floating exchange rate
No conflicts between exchange rate policies and monetary policies	Frequent conflicts between exchange rate policies and monetary policies
No balance of payments crises	Frequent balance of payments crises
Foreign reserves of 100 percent	Variable foreign reserves
Cannot become insolvent	Can become insolvent
Does not hold domestic assets	Does hold domestic assets
Full convertibility	Limited convertibility
Rule-bound monetary policy	Discretionary monetary policy
Not a lender of last resort	Lender of last resort
Does not regulate commercial banks	Often regulates commercial banks
Transparent	Opaque
Immune from corruption scandals	Prone to corruption scandals
Protected from political pressure	Politicized
High credibility	Low credibility
Earns seigniorage only from interest	Earns seigniorage from interest and inflation
Cannot create inflation	Can create inflation
Cannot finance spending by domestic government	Can finance spending by domestic government
Requires no preconditions for monetary reform	Requires preconditions for monetary reform
Rapid monetary reform	Slow monetary reform
Small staff	Large staff

Source: Hanke (2002).

In the view of Steve Hanke and other proponents of currency boards, they have advantages over central banks in

many cases, especially in developing countries. Since a currency board bases its supply of currency on a foreign (presumably stable) currency, it allows a developing country to import low inflation. Low inflation helps investment and capital-intensive technological processes thrive more than if future price levels are highly uncertain. The restraint on what the currency board is able to do also reduces the room the government to incur excessive debt and helps prevent bad policy-making (Labonte & Makinen, 2004).

The Bahamas currency board

In the early colonial period the Bahamas had a wide variety of currency in circulation, including Spanish, Columbian, Mexican, American, and British coins. In 1838, the pound was made the unit of account (British Royal Proclamation of 14th September 1838; see Chalmers, 1893; p.165.). The Bahamas used British coins thereafter until 1966. (Recall that under the British coinage system of the time, £1 = 20 shillings = 240 pence.) In 1888, the locally chartered Bank of Nassau was established. It issued notes, and was the only commercial bank ever to do so in the Bahamas. In 1917, the Bank of Nassau went out of business. It was taken over by the other bank in the islands at the time, the Royal Bank of Canada. British notes were in circulation, so the disappearance of local notes did not create much problem for the money supply.

After a lag, the government issued paper currency (Rabushka, 2010, p.3). The Currency Notes Act of 1919 established the Board of Commissioners of Currency, creating the currency board. The commissioners consisted of the colonial secretary, the Receiver General (a financial official), and one person not a government employee nominated by the governor. The board was allowed to issue notes of 4 shillings (approximately equal to a U.S. dollar), 10 shillings (half a pound), and one pound. The Currency Notes Act also allowed conversion of gold and silver coins to Bahamian notes on demand and apparently without any commission fee. It established a limit on note issuance of £10,000.

Initially, the Board was required to hold two-thirds of its assets in coin, but the proportion could be reduced to one-half by the governor with the approval of the British government. In addition to full backing for notes, the government of the Bahamas was required to establish a Depreciation Fund as a safeguard against depreciation of the Board's assets and gradually fund it until it reached 10 percent of the amount of notes outstanding. The Board could only hold securities of parts of the British Empire other than the Bahamas.

The Currency Notes Act of 1936 changed the currency board from one where gold and silver coins were the anchor currency and the major assets to one where the pound sterling was the anchor currency and sterling assets were the sole assets. This change followed Britain's abandonment of the gold standard in 1931. Section 6 of the Act stated,

> The Commissioners shall issue on demand to any person desiring to receive currency notes to the equivalent value (at the rate of one pound sterling) of sums in sterling, lodged with the Crown Agents in London by the said person, and shall pay on demand through the Crown Agents to any person desiring to receive sterling in London the equivalent value calculated as aforesaid of currency notes lodged with them in the Colony by the said person.

In order to guarantee this conversion's soundness, the Board was required to hold 100 percent minimum sterling reserves of all local notes in circulation. The act also stated that these sterling reserves should only be held by the Crown Agents (not the local government).

> The Note Security Fund shall be held by the Crown Agents and may be invested in securities of, or guaranteed by, the Government or any part of the British Empire (except the Government of the Colony) or such securities as the said Crown Agents, with the approval of the Secretary of State, may in their discretion select...

The Currency Board operated under these procedures until 1965. The Currency Act of 1965 effectively reduced the currency backing required to 50 percent of the "face values for currency notes" and allowed the reserves to be in U.S. dollar assets, along with gold and sterling assets. This Act's ultimate goal was to

decimalize the Bahamian currency and to make transactions with the U.S. dollar more convenient, since the United States was becoming increasingly important as a trade and investment partner. The Bahamian dollar, worth 7 shillings (£0.35) was introduced, along with a full complement of decimal coins. The valuation of the Bahamian dollar made it worth slightly less than the U.S. dollar (98 U.S. cents).

> The Currency Security Fund shall be held by the official bankers or by the Commissioners of Currency in the name or to the order of the Government of the Bahama Islands and may, subject to the general or specific directions of the Minister, be held or invested by them in any of the following, that is to say:
> a) gold coin or gold bullion;
> b) sterling notes, sterling coin, bank balances and money with official bankers;
> c) balance in a bank in any part of the Commonwealth outside the Colony, whose currency is freely convertible into sterling or in the United States of America, and notes, coins and money at call;
> d) Treasury Bills maturing within one hundred and eighty-four days issued by the Government of any part of the Commonwealth outside the Colony, whose currency is sterling or is freely convertible into sterling or by the Government of the United States of America; or
> e) securities issued or granted:
> i) by the Government of any part of the Commonwealth outside the Colony, whose currency is sterling or is freely convertible into gold or sterling, or by any local authority in any such part of the Commonwealth which are by the law of such part authorized for the investment of trust monies;
> ii) by the Government of the United States of America or other securities issued in the United States of America which by any law in force in that country are authorized for investment of trust monies (Quote on the Currency Notes Act of 1965 from Ramsaran (1984).

In 1967, Britain devalued the pound sterling from $2.80 to $2.40. Since the Bahamas was already a U.S. dollar-based economy, the devaluation heavily increased the import price of

American goods and ultimately lost the currency board and commercial banks millions of dollars (Rabushka, 2010). The Bahamas decided to end the fixed exchange rate with the pound sterling and instead linked to the U.S. dollar at parity.

A year later, Act No. 27 established the Bahamas Monetary Authority (BMA), which acted as a preliminary to a central bank. This marked the end of the currency board. The BMA was required to hold reserves in foreign assets equal to at least 50 percent of local notes in circulation, with at least half of foreign assets being U.S. dollars. It was allowed to use discretionary monetary policy (buying government debt) and was authorized to be a lender of last resort (This summary of the economic history of the Bahamas was heavily influenced by Ramsaran (1984).

On July 10, 1973, the Bahamas became an independent country. A year later, in 1974, the Central Bank of the Bahamas was established. The Central Bank's duty is:

> to promote and maintain monetary stability and credit and balance of payments conditions conducive to the orderly development of the economy; to promote and maintain an adequate banking system and high standards of conduct and management therein; and to advise the Minister of Finance on any matter of a financial or monetary nature. [...] to safeguard the external value of the Bahamian dollar, which is fixed at a 1:1 parity with the United States dollar.

Statistical tests

We have compiled balance sheets from 1920 until 1968 using the Bahamas Official Gazette. The balance sheets contain information including the coins in circulation, the coin backing, and securities held by the Currency Board (along with other information). The Gazette released monthly statements of assets and liabilities up until June 1937, when the statements became semiannual. The coin backing was initially subdivided into gold and silver coins up until early 1926, when it became sterling coin (The reason for the change was, apparently, that Britain returned to the gold standard at the pre-World War I parity in 1926). The securities were listed by face and purchase

value until December 1933, when the market values were first published. Market values then became the primary method for evaluating the prices of securities. Data not found in the Gazette were collected from either Ramsaran (1984) or interpolated from previous statements. Other data, such as monetary statistics, price indexes, government finances, international transactions and national income statistics were also collected (The monetary statistics, price indexes, wages, government finances, international transactions, and national statistic were collected from a variety of sources including the Bahamas Colonial Annual Reports, Bahamas Blue Books, IMF, World Bank, Frankema (2010) and Haimann & Yasin (2012). Some data was unavailable in all sources checked). Some data were unavailable. Government collection of data was less advanced in the Bahamas than in some other British Caribbean colonies such as Barbados and Trinidad.

Was the Bahamas Currency Board Orthodox?

As stated before, there are certain characteristics that orthodox currency boards follow. The characteristic that we can easily verify is that was full convertibility to the anchor currency on demand. There are no reports of convertibility ever being infringed.

We will use the compiled balance sheets from 1920 until 1968 to test whether the Bahamas Commissioners of Currency had full foreign reserve backing. In order for this to be the case, the asset backing (the sterling coin backing plus the sterling investments) must be greater than or equal to the local notes in circulation. The data are collected for December 31 of each year, and data that were unavailable were interpolated from the previous data. A graph showing the percentage of assets in reserve to the local notes in circulation is below. Appendix A shows the underlying data, which are also available in an accompanying spreadsheet.

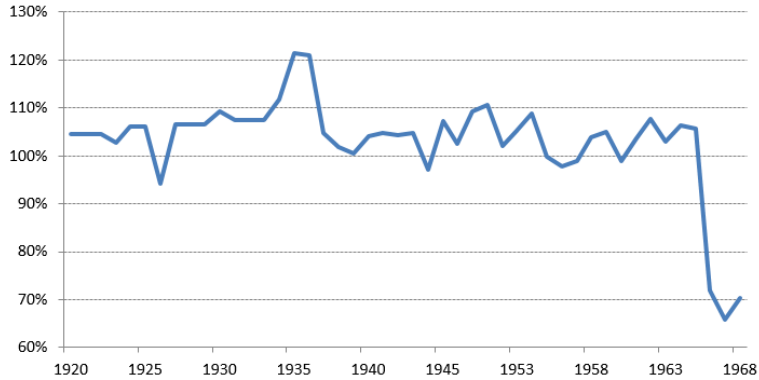

Figure 1. *Ratio of Foreign Assets to Notes in Circulation*
Note: Full Chart available in Appendix A
Source: Bahamas Gazette, various issues

For most of the Bahamas currency board era, the ratio of foreign assets to notes in circulation was greater than 100 percent (The coins in circulation were rarely under 100% before 1965), meaning it was orthodox for most of the board's life. This lasted until 1966, when the percentage dropped to nearly 70 percent; it then dropped further. The Currency Act of 1965 led to the change in sterling asset backing to local notes in circulation. The Act reduced the required sterling backing to 50 percent of the local notes in circulation, as well as decimalizing the Bahamian currency. This Act ultimately led to the change from an orthodox to unorthodox currency board. The asset backing further decreased with the creation of the BMA, and the required sterling asset backing was reduced to zero with the establishment of the Central Bank of the Bahamas.

Another test for orthodoxy is a reserve pass-through test. Reserve pass-through test is the year-over-year change in the monetary base divided by the year-over-year change in net foreign assets. Year-over-year data are used to remove any seasonal effects or disparities. The reserve pass-through should theoretically hover between 80 to 100 percent (Hanke, 2008).

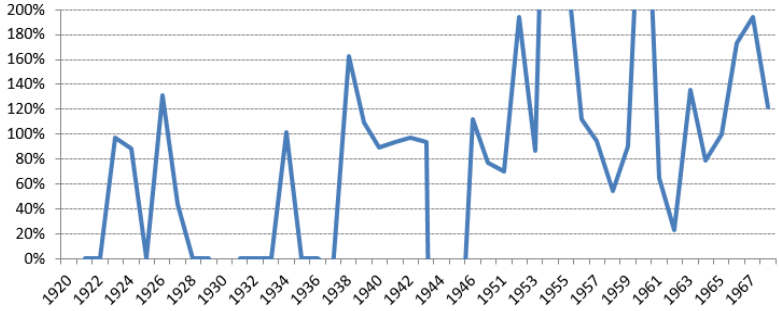

Figure 2. *Reserve Pass-Through Test Using Market Prices*

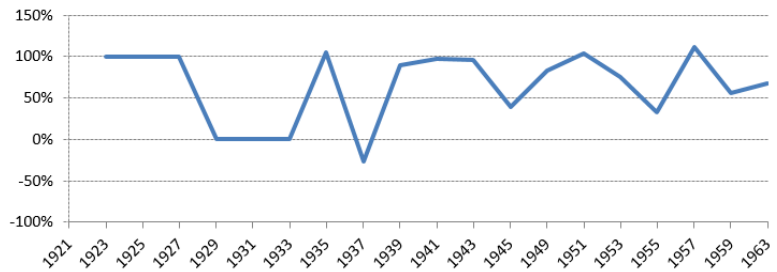

Figure 3. *Reserve Pass-Through Test Using Purchase Prices*

Although there are some fluctuations in the reserve pass-through test (which may be attributed to data inconsistencies), it seems to average around 100 percent. The reserve pass-through ratios were 0 percent in some years because notes in circulation or sterling assets remained the same year over year (therefore the ratio would either be 0 percent or undefined), or the currency board was earning interest on some of its assets. Both of these results display the minor defects of a reserve pass-through test. The reserve pass-through test with purchase prices uses biannual data in an attempt to see if the results are any different. After taking these defects into consideration, we can imply that from 1919 until the creation of the BMA, the Bahamas retained a fairly orthodox currency board

A final simple test of orthodoxy is comparing the domestic assets to the total assets of the currency board. An orthodox currency board should have few or no domestic assets. A small amount is often held for paying salaries or other local expenses (and is normal).

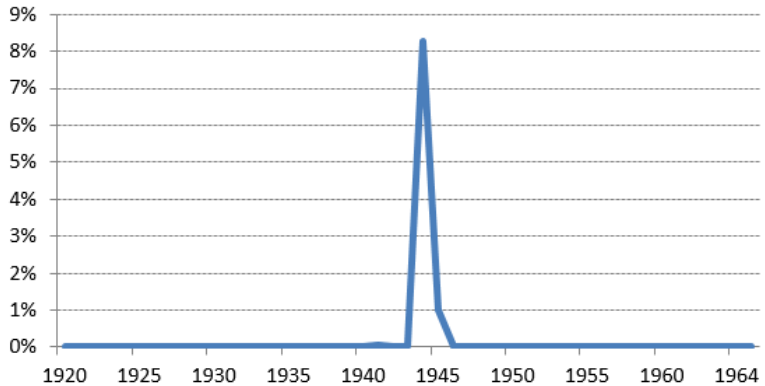

Figure 4. *% Domestic Assets to Total Assets*

Domestic assets as a percentage of total assets remained extremely low (if not 0) for most of the Bahamas currency board. The spike in 1944 could be attributable to a transfer of assets, but it is difficult to tell for sure.

Currency Board Period Surplus vs. Central Banking Period Deficit in Government Finance

An orthodox currency board is restricted from certain actions that can increase government expenditure in a country. The main restrictions that tend to check government spending include the inability to use discretionary monetary policy and to be a last resort.

The graphs below shows key statistics of government finance in the Bahamas from 1950 to 2002.

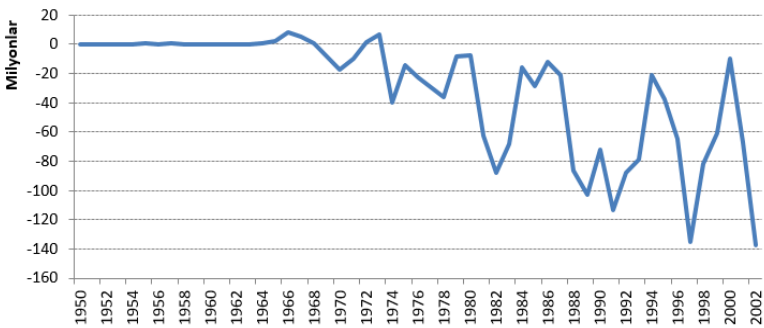

Figure 5. *Government Budget Balance (£ to 1966, then $)*

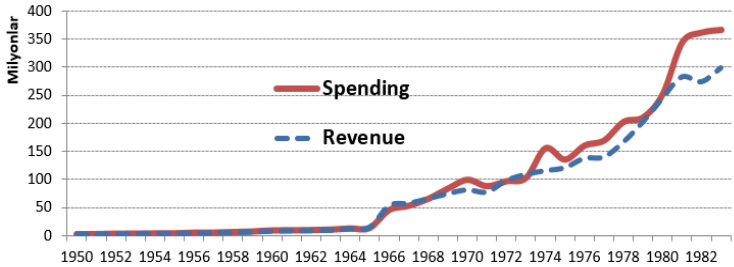

Figure 6. *Government Spending and Revenue (£ to 1966, then $)*
Source: Bahamas Annual Colonial Report

As shown in the graphs, the budget was typically quite close to balance up to the date the BMA was established, and remained fairly close to balance until 1973 when the Central Bank of the Bahamas was established. After the Central Bank was created, the balanced budget halted and deficits began accumulating.

Concluding Statement

The history of the Bahamas Currency Board was rather uneventful until 1965, when the law was changed to allow scope for discretionary monetary policy and the currency was decimalized. The pound sterling was devalued in 1967, the Bahamian dollar was delinked from sterling and linked to the U.S. dollar, and a new monetary authority was established that became a full-fledged central bank in 1973. Economic data from the currency board era are scarce, other than data for the board itself and for government finances. During the currency board era, the government budget was balanced on average, although not in every year, whereas after establishing a central bank the budget began to be persistently in deficit.

Appendix

See the accompanying Excel workbook for some monthly data as well as the data below.

A: *Currency board data (Bahamian pounds to 1965, then Bahamian dollars)*

Year	Notes in Circulation as of Statement Date	Coin Backing	Sterling Investments	Sterling Assets	% Assets to Notes in Circulation
1920	3,800.00	2,800.00	1,170.00	3,970.00	104.5%
1921	3,800.00	2,800.00	1,170.00	3,970.00	104.5%
1922	3,800.00	2,800.00	1,170.00	3,970.00	104.5%
1923	39,885.00	26,687.00	14,285.18	40,972.18	102.7%
1924	60,000.00	20,000.00	43,727.52	63,727.52	106.2%
1925	60,000.00	20,000.00	43,727.52	63,727.52	106.2%
1926	100,000.00	33,333.33	60,935.72	94,269.05	94.3%
1927	110,000.00	36,666.67	80,476.05	117,142.72	106.5%
1928	110,000.00	36,666.67	80,476.05	117,142.72	106.5%
1929	110,000.00	36,666.67	80,476.05	117,142.72	106.5%
1930	108,100.00	36,666.67	81,471.35	118,138.01	109.3%
1931	110,000.00	36,666.67	81,471.35	118,138.01	107.4%
1932	110,000.00	36,666.67	81,507.71	118,174.38	107.4%
1933	110,000.00	36,666.67	81,474.25	118,140.92	107.4%
1934	73,400.00	66.67	81,996.10	82,062.76	111.8%
1935	73,400.00	66.67	89,142.56	89,209.23	121.5%
1936	73,400.00	66.67	88,704.35	88,771.02	120.9%
1937	74,400.00	1,837.82	76,047.32	77,885.14	104.7%
1938	79,400.00	1,639.33	79,314.71	80,954.04	102.0%
1939	92,000.00	1,405.95	91,070.57	92,476.51	100.5%
1940	136,220.00	11,032.98	130,833.59	141,866.57	104.1%
1941	176,620.00	28,690.69	156,275.95	184,966.65	104.7%
1942	252,020.00	115,344.68	147,290.43	262,635.11	104.2%
1943	350,370.00	145,342.11	221,927.97	367,270.08	104.8%
1944	374,970.00	131,766.60	232,651.25	364,417.85	97.2%
1945	355,150.00	123,422.48	257,144.84	380,567.33	107.2%
1946	482,800.00	191,072.48	303,926.24	494,998.73	102.5%
1949	637,400.00	170,694.12	525,470.67	696,164.79	109.2%
1951	663,800.00	172,517.99	561,551.77	734,069.76	110.6%
1951	775,600.00	124,630.00	667,154.41	791,784.40	102.1%
1953	1,019,000.00	123,676.58	948,092.60	1,071,769.18	105.2%
1954	976,500.00	33,486.69	1,030,062.75	1,063,549.44	108.9%
1955	1,126,500.00	197,754.65	926,562.20	1,124,316.85	99.8%
1956	1,406,500.00	210,243.20	1,165,017.20	1,375,260.40	97.8%
1957	1,641,500.00	402,993.20	1,221,103.68	1,624,096.87	98.9%
1958	1,742,900.00	347,422.46	1,464,477.79	1,811,900.25	104.0%

1959	2,106,800.00	590,425.74	1,623,358.72	2,213,784.45	105.1%
1960	2,286,300.00	279,764.21	1,982,926.65	2,262,690.86	99.0%
1961	2,497,800.00	318,287.45	2,270,857.15	2,589,144.61	103.7%
1962	2,529,300.00	382,232.00	2,342,574.00	2,724,806.00	107.7%
1963	2,950,000.00	1,027,000.00	2,008,928.00	3,035,928.00	102.9%
1964	3,439,900.00	787,897.57	2,871,919.75	3,659,817.32	106.4%
1965	3,904,500.00	828,770.52	3,296,713.00	4,125,483.52	105.7%
1966	13,199,000.00	2,365,333.00	7,126,286.00	9,491,619.00	71.9%
1967	18,749,500.00	8,869,354.00	3,480,337.00	12,349,691.00	65.9%
1968	25,784,728.00	NA	NA	18,144,055.00	70.4%

Source: Bahamas, Official Gazette, various issues. Data are from December of each year. Unavailable data were interpolated from a previous month. The Bahamian dollar was worth Bahamian £0.35, or very nearly US$1.

B: *Government finance data (Bahamian pounds to 1965, then Bahamian dollars)*

Year	Revenue	Spending	Surplus or Deficit
1950	1,579,748	1,658,741	(78,993)
1951	2,044,385	1,828,642	215,743
1952	2,397,097	2,414,256	(17,159)
1953	2,610,678	2,712,272	(101,594)
1954	3,095,541	3,008,515	87,026
1955	3,507,953	3,188,617	319,336
1956	4,078,921	4,193,544	(114,623)
1957	4,938,958	4,314,864	624,094
1958	5,198,975	5,434,533	(235,558)
1959	6,456,795	6,420,512	36,283
1960	7,988,620	8,337,188	(348,568)
1961	8,563,582	8,574,914	(11,332)
1962	8,689,155	9,042,292	(353,137)
1963	9,599,255	9,834,388	(235,133)
1964	12,163,983	11,841,916	322,067
1965	14,953,369	12,687,189	2,266,180
1966	53,264,000	44,750,000	8,514,000
1967	57,250,000	52,220,000	5,030,000
1968	65,689,000	64,792,000	897,000
1969	74,572,000	82,868,000	(8,296,000)
1970	81,318,000	98,778,000	(17,460,000)
1971	77,503,000	87,326,000	(9,823,000)
1972	97,748,000	96,201,000	1,547,000
1973	108,784,000	101,975,000	6,809,000
1974	115,400,000	155,100,000	(39,700,000)
1975	120,700,000	134,800,000	(14,100,000)
1976	137,400,000	159,800,000	(22,400,000)
1977	139,700,000	169,000,000	(29,300,000)
1978	166,300,000	202,200,000	(35,900,000)
1979	202,100,000	210,300,000	(8,200,000)
1980	244,100,000	251,900,000	(7,800,000)
1981	282,200,000	344,400,000	(62,200,000)
1982	273,500,000	361,700,000	(88,200,000)
1983	298,200,000	366,600,000	(68,400,000)
1984	334,000,000	350,000,000	(16,000,000)
1985	376,800,000	405,200,000	(28,400,000)
1986	398,900,000	411,100,000	(12,200,000)
1987	436,100,000	457,400,000	(21,300,000)
1988	432,600,000	519,000,000	(86,400,000)
1989	448,000,000	550,700,000	(102,700,000)
1990	497,800,000	569,700,000	(71,900,000)
1991	490,400,000	604,100,000	(113,700,000)
1992	534,600,000	622,700,000	(88,100,000)

1993	536,300,000	615,400,000	(79,100,000)
1994	613,600,000	635,000,000	(21,400,000)
1995	655,200,000	693,000,000	(37,800,000)
1996	678,900,000	743,300,000	(64,400,000)
1997	728,500,000	863,800,000	(135,300,000)
1998	761,300,000	842,800,000	(81,500,000)
1999	859,100,000	919,800,000	(60,700,000)
2000	940,800,000	950,400,000	(9,600,000)
2001	931,400,000	998,400,000	(67,000,000)
2002	885,500,000	1,022,900,000	(137,400,000)

Sources: Bahamas annual colonial report, IMF, Rabushka (2010), Frankema (2010).

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