

LESSONS FROM ARGENTINA'S CURRENCY BOARD SYSTEM FOR INDONESIA

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Abstract

The purpose of this study is to attempt to draw lessons from Argentina's Currency Board System (CBS) for Indonesia. Moreover, this study reviews Argentina's economic performance before and after the implementation of the CBS, through an examination of some macroeconomic indicators namely real GDP growth, interest rates, money and inflation, as well as fiscal condition. The first three indicators are compared to the US, as the reserve-currency country, and Indonesia. The last indicator is compared to Indonesia only.

In summary, the study found that after the adoption of the CBS the economic growth of Argentina substantially improved. The real interest rate tended to converge with the US interest rate, and the inflation rate that is linked to money growth was brought down to a low level close to the US inflation rate. However, this study also produced some more important findings. First, the long-run sustainability of Argentina's economic growth with its CBS is questionable. Second, the real interest rate convergence was broken due to high default risk and deflationary expectations in Argentina. Third, low inflation later on turned to deflation as a consequence of the over-valued nominal exchange rate. Fourth, lack of sound fiscal policy and weak fiscal performance undermined the CBS regime. Finally, the study suggests that the absence of a lender of last resort is an institutional weakness of the CBS.

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INTRODUCTION

The CBS has undergone a revival in the 1990s. Since 1991, other countries have adopted the CBS, and up to 2001, there were a total of 14 countries and regions that had implemented a CBS. The IMF has provided financial support for the adoption of the CBS in some countries, including Argentina. Some economists initially praised the adoption of the system by Argentina in early 1991, but subsequently the Argentine economy fell into disarray. Debates also took place about whether some Asian countries such as Indonesia should adopt the CBS as a means of escaping from the impact of the Asian financial crisis in 1997-1998.

An approach to determine whether or not the introduction of a CBS would be appropriate for Indonesia is to look at the lessons that have emerged in the light of the introduction of this system in Argentina. Both countries are similar to some degree; for instance they both are medium-sized and developing countries. Hence, the purpose of this study is to attempt to draw lessons from Argentina's CBS for Indonesia.

This study reviews Argentina's economic performance before and after the implementation of the CBS, through an examination of some macroeconomic indicators namely real GDP growth, interest rates, money and inflation, as well as fiscal condition. The first three indicators are compared to the US, as the reserve-currency country, and Indonesia. The last indicator is compared to Indonesia only. The data was mainly collected from the International Financial Statistics (IFS) CD-ROM and Government Finance Statistics Yearbook produced by the IMF. In general, this study uses annual data, range from 1975 to 2000.

In summary, the study found that after the adoption of the CBS the economic growth of Argentina substantially improved. The real interest rate tended to converge with the US interest rate, and the inflation rate that is linked to the money growth, was brought down to a low level close to the US inflation rate. Nevertheless, this study also produced more important findings, i.e., that the economic growth was proven to be sensitive to external shocks. Hence, the long-run sustainability of Argentina's economic growth with its CBS is questionable. The interest rate tendency to converge was broken afterwards since the default risk was increasing and there were deflationary expectations instead of low inflationary expectations in Argentina. Low inflation at a later stage turned to deflation as a consequence of an over-valued fixed nominal exchange rate. Thus, a higher real exchange rate must be brought down by a reduction in domestic prices as well as domestic economic activity and aggregate income. In addition, lack of sound fiscal policy and weak fiscal performance undermined the CBS regime. Finally, the study suggests that the absence of a lender of last resort is an institutional weakness of the CBS.

The remainder of the study shall proceed as follows. Chapter 2 presents a theoretical review of the CBS. Chapter 3 discusses the empirical findings of selected macroeconomic indicators comparison of Argentina, the US and Indonesia. Finally, Chapter 4 provides some conclusions.

THEORETICAL REVIEW OF THE CURRENCY BOARD SYSTEM

As defined by Hanke and Schuler (2000, p. 5):

“A currency board is a monetary institution that issues notes and coins (and in some cases, deposits) fully backed by a foreign reserve currency and fully convertible into the reserve currency at a fixed rate and on demand.”

The CBS is a special form of pegged exchange rate system. The exchange rate of domestic currency against the reserve currency is set by public law. “It differs from conventional pegs in regard to the nature of the restrictions it sets on changing the level of the exchange rate, and most importantly on the sources of reserve money creation it utilises” (Balino and Enoch 1997, p. 3). Furthermore, since the CBS guarantees to convert domestic currency for foreign exchange at a fixed rate, on demand, and under all circumstances, it must guarantee this undertaking by fully backing the domestic monetary base with current assets denominated in foreign-reserve currency.

1. History of the CBS¹

The history of the CBS dates back to the early 19th century, when the British implemented the gold standard regime and attempted to avoid deficit financing. According to Walters and Hanke (in Newman, et.al. 1992), the principle underpinning the currency board originated in the provisions of the (British) Bank Charter Act of 1844, which became known as the Peel’s Act. Subsequently, it was adopted in many British colonies in Africa, Asia, the Caribbean, and the Middle East.²

Before the CBS was implemented, in many British colonies, they used metropolitan currency (sterling notes and gold sovereigns) and coins of the imperial power as a medium of exchange and as a unit of account. The advantage of this practice was that sterling notes and coins were widely accepted among the colonies and had a stable value. However, this practice had two significant disadvantages for the colonies. First, any loss of currency notes would

1 Details of currency boards history can be found in Walters and Hanke (Eds. Newman, et. al. 1992, pp. 558-561) and Schwartz (Eds. Meltzer and Plosser 1993, pp. 151-169)

2 Schwartz (1993, pp. 151-158) provides different perspectives on the history of the CBS. She concluded that the governors of a colony to solve a colonial monetary problem initiated the CBSs in the British colonies. Furthermore, she expressed reservations as to whether the CBS really originated from Peel’s act.

benefit the issuer e.g. the Bank of England, as the colony would correspondingly lose the real value of the notes. Secondly, it was the British who earned the seigniorage as a result of printing the sterling to meet the demand for its currency in those colonies.

The establishment of a currency board enabled the colony to avoid losses from the accidental destruction of notes. The sterling notes were stored in the board's vaults as reserve assets, and local currency could be issued to the same value by the board. This meant that the local currency was backed 100% by reserve assets. Thus, accidental loss of domestic notes would not diminish the net assets of the colony. In addition, the currency board would find it expedient to replace worn notes from its stock, avoiding the need to have its assets tied up sending battered sterling notes back to London for reissue. As the colonies became independent states, however, they generally abandoned the CBS and established a central bank to manage their currencies for economic development purposes and also to create government revenue through printing their own currency (seigniorage). Only a few countries still adhered to the CBS after the British imperial era ended.

Schwartz (1993, pp. 169-170) lists two major reasons why the CBS was abandoned in those independent countries. First, the critics of imperialism alleged that currency boards were designed to enhance imperial, not colonial economic purposes. Second, the proponents of central banking believed that a central bank would lead to an independent monetary policy for the newly independent countries. Thus, the establishment of a central bank became a symbol of being a sovereign nation. Moreover, the establishment of a central bank was believed to facilitate macroeconomic stabilisation, economic growth, and development, which became the economic goals of the newly independent countries.

Schwartz also concluded that earlier economic fundamentals had favoured currency boards for three reasons. First, the colonies' currencies were linked to a reserve currency, which itself was based on the gold standard. Thus, the reserve currency was backed by 100% gold reserves during the gold standard regime. Under the gold standard regime, no independent monetary policy was possible because the gold itself became an *automatic stabiliser*. Second, it was common for the colonies' major trading partner to be 'the mother country', so it was easy to link the local currency to the currency of the country with which the majority of foreign trade was done. Third, during the era of British colonialisation, it was common for the colonial banks to be branch offices of London based banks. Therefore, the London head offices acted as a lender of last resort where necessary.

Today, circumstances surrounding the new CBS regimes are very different from the circumstances surrounding the old regimes. First, there are no currencies now similar to the ones described. Accordingly, a CBS on a fixed exchange rate has disadvantages because no country currently follows the gold standard. Monetary policies conducted by authorities in

foreign countries are adopted with their own economies in mind, regardless of its effects on other countries. Second, trade is now more diversified, thus each country trades with many other nations and has more major trading partners. Not all of a country's trading partners use a particular currency (e.g. US dollar) as payments. In short, any country that links its currency to a reserve currency may suffer the disadvantages of relative price changes that arise from changes in exchange rates. Thirdly, the banking industry is much more developed today and usually there are more local banks than foreign banks operating in any one country. The absence of a lender of last resort facility under a CBS is an institutional weakness because its function is to prevent outbreaks of panic in the financial sector. In theory, under a CBS, the best policy regarding banks is to let the troubled banks fail.³ In practice, however, the case is not that simple, since most of the time the financial turmoil is affecting the financial or banking industry as whole, not just few banks. Thus, the major economic conditions for a well-functioning currency board no longer exist.

2. The Revival of the CBS

The CBS has undergone a revival in the 1990s. Since 1991 five countries have adopted the CBS and up to 2001 there were a total of 14 countries and regions that had implemented a CBS.⁴ Balino and Enoch (1997) mentioned that four countries have undertaken IMF-supported adjustment programs with a CBS: Argentina, Djibouti, Estonia, and Lithuania. Later, Bosnia-Herzegovina and Bulgaria did likewise.⁵ Debates also took place as to whether some Asian countries such as Indonesia should adopt the CBS as a means of escaping from the impact of the Asian financial crisis in 1997-1998.

Two interesting facts stand out when one looks at the type of countries and regions that adopted a CBS. First, most of them are small countries or regions. Argentina and Bulgaria are the principal exceptions as they can more accurately be categorised as middle-sized countries. Second, the implementation of the CBS after 1990 was precipitated in part by the mounting economic problems that were experienced by these countries. Argentina implemented the CBS after experiencing a long period of economic stagnation and hyperinflation. The implementation of the CBS in Bulgaria, Estonia, and Lithuania followed the collapse of Communism in Eastern Europe and Russia. As for Bosnia-Herzegovina, the CBS was implemented only after the new country proclaimed its independence from the Yugoslavian Federation, and only after being confronted by a raft of post-civil-war economic problems.

3 Schuler, <http://users.erols.com/kurrency/intro.htm> , 29/01/2002

4 Source: Balino and Enoch (1997); Enoch and Gulde (1998); Hanke and Schuler (2000); Kopcke (1999), Williamson (1995). Small Caribbean countries pooled as one region.

5 The record of CBS implementation up to 1999 in Estonia, Lithuania, Bulgaria and Bosnia-Herzegovina can be found in Hanke (2000).

The following two sections give examples of the renaissance of the CBS. The first section explores the background of the establishment of the CBS in Argentina. The second examines this revival in the light of the proposal to implement it in Indonesia during the financial crisis experienced in 1997-1998.

Argentina's Attempts at Achieving Economic Stabilisation

In 1985, the authorities of Argentina adopted a series of stabilisation programmes to recover from conditions of hyperinflation that had reached 626% in the previous year. A continued lack of fiscal discipline, however, resulted in a persistently high rate of monetary expansion, as the public sector essentially relied on the central bank for deficit financing. As a consequence, economic conditions deteriorated during the late 1980s with the consumer price inflation rate surging to 3,079% in 1989.

Argentina formally adopted the CBS on April 1, 1991, through the Convertibility Law as a way of restoring its long history of domestic economic problems. Under this system the Argentine peso was pegged to US dollar one to one. The Central Bank of Argentina was re-organised and commenced performing the role of a Currency Board. The early years of Argentina's CBS were stunningly successful; thus, the CBS appeared to have passed its first test. However, as a consequence of the Mexican peso crisis in 1994, concerns about the health of the Argentine economy resulted in deposit withdrawals and significant amounts of pesos being exchanged for US dollars. With financial help from international agencies, Argentina's CBS passed the second test.

In late 1998, Argentina faced another serious economic and financial crisis. Some analysts said that this financial crisis was an effect of East Asia's crisis in 1997, which led to a global financial crisis.⁶ When Brazil, one of Argentina's major trading partners, devalued its currency in January 1999, the crisis became worse. In the late 1990s, the Argentine economy was experiencing deflation rather than inflationary conditions. Furthermore, the government's inability to find new financial sources or to rollover its debt increased the possibility of the country defaulting on its international debt of US\$ 141 billion.⁷ The government's tight fiscal policies involved cutting expenditure. Tight controls on banking operations by limiting deposit withdrawals, led to a strong negative response from the public in December 2001, which in turn led to an eruption of political and social chaos.

As a result, the credibility of the CBS in Argentina, which had been in operation for 11 years was lost, and the CBS was blamed for its inability to resolve the recent economic crisis.

⁶ Stiglitz, http://www.project-syndicate.org/series/series_text.php?id=760 14/02/2002; Feldstein, http://econ161.berkeley.edu/macro_online/timely/economists_say/Feldstein_Argentina... 14/02/2002.

⁷ From Bloomberg, http://quote.bl.../fgcgi.cgi?touch=1&btittle=Top%20News&T=sa_content.ht&s=..., 13/02/02.

On February 11, 2002, Argentina abandoned the CBS and floated its peso rate of exchange against US dollar.

Indonesia's Financial Crisis

In mid 1997, some emerging Asian countries including Indonesia faced economic turbulence, characterised by weakened domestic currencies against major currencies, banking crises, and high inflation. The crises continued up to 1999, especially for Indonesia, which suffers from a weak financial system. During 1998 there were some calls for the government to adopt a CBS as an alternative way out of this crisis; in order to contain its wild exchange rate fluctuations, and to restore the government's credibility especially concerning lowering inflation. A US economist, Steve Hanke, who raised it with Indonesia's leader Soeharto in mid 1998, first proposed the idea. This precipitated widespread debate in the country as well as an objection from the IMF.⁸

Schuler (1998) argued that Indonesia should adopt a CBS to reverse the severe depreciation of the Rupiah instead of focusing on fixing the banking system, imposing trade restrictions, and addressing the government budget problems. In his opinion, the failure of the central bank to quickly stabilise the currency during the crisis should be treated as the main concern. By changing the Bank Indonesia's function from a central bank to a currency board, Indonesia would be able to 'import' good monetary policy from the reserve-currency country, rather than rely on its own weak monetary policy.

The proposal to adopt the CBS in Indonesia was not pursued any further. Spiegel (1998) argues that the main reasons why a CBS was not suitable for Indonesia are that: it would be costly to maintain, the degree of uncertainty surrounding the current "correct" value of the Rupiah rules against it, and finally, that raising the additional foreign reserves necessary to launch a CBS would place a bulk of fiscal burden on the nation. Another approach to determine whether or not the introduction of a CBS would be appropriate for Indonesia is to look at the lessons that have emerged in the light of the introduction of this system in Argentina.

3. Design of a CBS

Decision on Reserve Currency and It's Exchange Rate

Two important decisions have to be made by a currency board. First, the board has to choose a reserve currency. This is a decision that should be based on the excellent reputation

⁸ The full report can be found in <http://www.asiaweek.com/asiaweek/98/0306/nat4.html> 21/03/2002

of the reserve currency, in order to lend considerable confidence to the board's own currency. In principle, a board could use a specific weighted average, or a basket of several currencies. In practice, however, currency boards usually fix their currencies to only one foreign currency. One of the reasons for this relates to the need for transparency from the public point of view. However, "the value of the reserve currency should tend to vary with respect to the currencies of its trading partners in a way that supports the needs of its economy" (Kopcke 1999, p. 24). For this reason, US dollar and Euro are the most dominant choices for reserve currencies.

The second decision confronting a central board is to determine the exchange rate of the reserve currency for the domestic currency to be employed. Determining the right exchange rate for an emerging economy's currency is difficult because estimates of its equilibrium value are often questionable. For example, a value that may appear appropriate in the first few years may be considered inappropriate later on. Hence, as argued by Kopcke, the starting exchange rate for the currency board is often set slightly below predictions of its equilibrium value in order to give the economy a competitive advantage at the beginning. With a lower value, the fiscal authority also has some space for improving its fiscal balance, since capital inflows and investment tend to raise the government's revenues while at the same time lowering the pressure on its spending. Nevertheless, a very low rate of exchange would initially cause the price for imported goods and services to rise and potentially transmit an inflationary bias to the economy. This in turn may threaten the success of the CBS and be self-defeating.

Macroeconomic Policies and Fiscal Discipline

Mussa et. al. (2000) pointed out that monetary policy carried out in the CBS is entirely subordinated to the exchange rate regime. Expansions and contractions in the supply of the monetary base, and therefore, movements in domestic interest rates are determined by net flows of foreign exchange. These arrangements hindered the adjustments in the real exchange rate through movements in the nominal exchange rate. Consequently, adjustments to changing economic conditions, which influence the equilibrium of the real exchange rate, must be performed by other means, including movements in the level of domestic prices and costs, and movements in economic activity and employment. For these reasons, flexibility in the economy and sound macroeconomic policies are crucial for establishing and sustaining a CBS.

The CBS's key role is to raise policy credibility, but credibility cannot be maintained and the CBS cannot be defended without fiscal discipline. A strong fiscal position can be used to limit the country's dependence on foreign savings and can contribute to the accumulation of foreign reserves, which is also crucial to the elevation of the credibility of the board and the reduction of the risk of speculative attacks.

Enoch and Gulde (1997) also argue that the successful adoption of a CBS demands that, in addition to adopting sound macroeconomic policies, the authorities must make careful arrangements on the technical aspects of the transition. The extent of the necessary arrangements will depend on each country's condition, but will generally involve changing central bank regulations, reorganising the central bank, drafting appropriate guidelines for reserve management, and adapting to the government's fiscal activities. Additional preparations are required for countries that recently experienced problems in their banking sector.

The Differences between a Currency Board and a Central Bank

The key differences between a currency board and a central bank can be depicted in the following simplified T-account of each institution:

Figure 1
T-account of a Central Bank and a Currency Board

Central Bank	
Assets	Liabilities
International Reserves	Notes
Domestic assets (i.e. Government debts)	Deposit of commercial banks
	Capital

Currency Board	
Assets	Liabilities
International Reserves	Notes
	(Deposit of commercial banks)
	Capital

Central Bank assets consist of international reserves, which are used to manage the exchange rate. International reserves may consist of foreign currencies (usually hard currencies) and interest-paying assets denominated in these foreign currencies. The central bank also holds domestic assets, of which the major part is usually government debt. On the liability side, central bank issues notes, which are held by both the public and commercial banks. In addition, the commercial banks always hold their reserves (other than vault cash) at the central bank. The sum of the notes and the deposits of the commercial banks are the base money, M0. The capital shows the excess of assets over liabilities.

In contrast, a currency board issues notes solely in return for the chosen reserve currency, so that its balance sheet consists principally of its holdings of reserve currency on the asset side and a nearly equal value of notes in the public and bank's hands on the liabilities side. The commercial bank's reserves may be deposited at the currency board, but unlike in a central bank system, this is not compulsory. As explained by Williamson (1995), currency boards usually hold a slightly bigger value of assets than the value of their liabilities in order to guard against the risk of the declining market value of their assets. However, since the assets are highly liquid, this excess, which corresponds to the capital of the currency board, does not need to be big. This implies that the currency board's capital is lower than the central bank's capital. In addition, unlike the central bank, the international reserves of the boards are dominated by the foreign currency and interest-paying assets denominated in reserve currency.

The distinctive feature of a currency board is that it does not hold domestic assets. A currency board does not lend to commercial banks, nor can it buy domestic assets from commercial banks. Thus, a currency board does not perform the function of a lender of last resort.

Since a currency board does not hold domestic assets, it has no discretion in its monetary policy. It increases the monetary base when the private sector wants to sell reserve currency and decreases the monetary base when the private sector wants to buy reserve currencies, at a predetermined exchange rate. In other words, there is no room for independent monetary policy. In contrast, a central bank can manage the monetary base by changing the share of foreign exchange on its balance sheets by buying or selling domestic assets.

Rules vs. Discretion in Monetary Policy

There has been a continuing debate on whether policymakers should place a primary emphasis on the rules or adopt a discretionary policy. Rules-based monetary policy requires monetary authorities to follow clear, transparent, statutory rules. In contrast, the formulation of discretion-based policies reflects the monetary authority's activities on a day-to-day basis. Proponents of discretionary-based policy argue that discretion will enable authorities to act in a timely fashion or with greater flexibility in dealing with unexpected economic circumstances.

According to Fischer (1994, in Schaling 1995), proponents of rule-based policy have employed two kinds of arguments in order to show the undesirability of employing governmental discretion in making monetary policy. The first type of argument as encapsulated in Friedman's (1959) view is that "policymakers not bound by a constant money growth rate rule would be tempted into *excess activism*, [which is] destabilising rather than stabilising for

the economy." The second type represented by Kydland and Prescott (1977) introduces the concept of *dynamic inconsistency*, sometimes referred to as the time inconsistency problem, which emphasises the inflationary bias of discretionary monetary policy.

Kydland and Prescott have changed the debate surrounding rules against discretion. They argue that the incapability of policymakers to commit themselves to a low inflation policy can lead to excessive inflation, while the tradeoff between long-run output and inflation is absent. Their basic observation is that with its discretionary power, policy makers will alter the public expectations of inflation. Policymakers will undertake expansionary policies to drive output temporarily above its normal level, since the marginal benefit of higher output is positive and the marginal cost of slightly higher inflation is zero. The public's knowledge that policymakers have this power and intention to exercise it means that they will expect higher inflation. Hence, the final outcome is that the policymaker's power to undertake discretionary policy results in an increase in inflation without any increase in output. This result implies that the credibility of policymakers with discretionary policy is low.

There are a variety of approaches to address the dynamic-inconsistency problem of low-inflation monetary policy, such as binding rules, a model of reputation, and delegation.⁹ In practice, the CBS that is designed to deliver price and exchange rate stability can be categorised as one type of a rules-based monetary regime, which is enforced by a public law. The law is used to ensure the board's commitment in achieving and maintaining low inflation as well as facilitating the public understanding of monetary policy carried out by the board.

Seigniorage

To finance its spending, a government has three alternative sources: first it can raise revenue by taxes; second it can borrow from the public by selling government bonds; and finally it can create revenue by printing money, which in practice is carried out by its central bank.

A central bank may extend direct loans to the government or buy government bonds as well as buy private domestic assets (e.g. banker acceptance) by printing money. The interest revenue earned on these assets is substantial compared to the cost of printing and maintaining the money stock. However, when a central bank prints new money to finance government expenditure, it increases the money supply, which in turn increases inflation. As the money supply increases, prices also increase, which will result in a decrease in the real value of money held by the public. This process is known as *inflation tax*.

In a CBS system, the country providing the reserve currency earns most seigniorage.

⁹ See Romer (1996) for details of the model of reputation and delegation.

This applies both to seigniorage earned through interest revenue and central bank assets and the inflation tax. Like a central bank, a currency board is still able to obtain revenue from its possession of foreign interest paying assets, however, the interest rate of these foreign assets is usually lower than the interest rates associated with domestic assets. In addition, under a CBS the lender of last resort function is curtailed, the board cannot provide loans to commercial banks, so no interest revenue is collected. Hence, it can be inferred that the board's seigniorage and other revenues are lower than those of the central bank.

4. Strengths and Weaknesses of the CBS

Strengths of the CBS

"Economic credibility, low inflation, and lower interest rates are the immediately obvious advantages of a CBS" (Enoch and Gulde 1998, p. 2). Moreover, according to Balino and Enoch (1997), a CBS's strength accumulates from its simplicity and the limited discretion of its operating regulations. These regulations discharge or significantly curtail the extent of discretion in monetary and foreign exchange rates policies, and thereby enhance the credibility of the regime and simplify the monetary operations. The next section will examine the specific strengths of a currency board.

Simplicity of Administrative and Operational Control

The operating rules of a currency board are simple. Also the general public can monitor its performance, if appropriate information is made available and is easily accessible. Setting the exchange rate at a fixed level simplifies the management of the foreign exchange market. Reducing monetary operations and transferring other central bank roles such as its payments system and its fiscal agent functions, can significantly reduce the need for employees and bookkeeping.

Monetary and Fiscal Policies Credibility

By abolishing or strictly constraining the monetary authority's ability to finance fiscal deficits or to provide loans to banks, the currency board can rapidly encourage credibility both in regards to monetary and fiscal policies. Low inflation conditions that closely resemble the low inflationary conditions of the reserve-currency country can be established. By providing clear signals about the policy purposes of the authorities and by ensuring monetary autonomy from government intervention, the CBS promotes an adjustment of expectations and encourages wage and price disciplines, thereby reducing potential inflation biases.

Currency Stability and Financial Reintermediation

The convertibility assurance provided by the CBS means that it is less subject to policy reversals than conventional fixed pegs. In particular, in a time of high and growing capital mobility, this approach is considered to be less vulnerable to destabilising capital outflows and self-fulfilling currency crises (Balino and Enoch 1997). Moreover, as a consequence of eliminating exchange rate uncertainty, lowering the risk premium in interest rates, and maintaining orderly monetary conditions should also help to promote, in the long run, international trade and economic growth.

Interest Rate Convergence

The CBS facilitates access to international capital markets. The improved credibility of monetary policy will result in rapid interest rate convergence to levels in the reserve currency country and help it to stay close to international levels (Balino and Enoch 1997). Other proponents also suggest that a typical CBS tends to have interest rates similar to the levels prevailing in the reserve currency, plus a portion for political risk, taxes, and transactions fees (Hanke and Schuler 2000). As the regime gains credibility and prevents depreciation, the inflationary expectations that influence interest rates will be curtailed.

Weaknesses of the CBS

In general, two problems commonly surface when using binding rules to deal with the dynamic-inconsistency problem (Romer 1996). First, rules are inflexible in response to unexpected shocks such as a severe stock market crash, a capital crunch, or a breakdown of the relationships between economic activity and the money stock. Second, from an empirical perspective, low rates of inflation have been observed in many situations where monetary policy is not decided according to fixed rules. The weaknesses of a CBS in particular will be dealt with in the next section.

Nominal Exchange Rate Inflexibility

Nominal exchange rates in a CBS are fixed and formalised by law. Consequently, adjustments to changing economic conditions influencing the equilibrium of the real exchange rate, must be made in other ways, such as movements in the level of domestic prices and aggregate income. The equilibrium condition in the real exchange rate can be presented by the following equation:

$$RER = e \frac{P}{P^*} \quad (1)$$

Where RER is the real exchange rate; e is the nominal exchange rate (which is fixed in the CBS), expressed in units of foreign currency per unit of local currency; P is the domestic price level; and P^* is the foreign price level. A fall in RER denotes a real depreciation.

Highly variable nominal exchange rates can indicate instability in the underlying economic structure. However, eliminating this indicator by setting the nominal exchange rate at a fixed level does not solve the core problem and only makes alternative adjustments to them more painful (Friedman 1953). For example, an overvalued nominal exchange rate implies that the real exchange rate is above its equilibrium; an adjustment attempt occurs through a decline in domestic prices or deflation. Then, different degree of flexibility in prices may create a distortion in the adjustments, e.g. wages are especially inflexible downwards, so the rate of unemployment will increase.

Financial Instability

Currency boards are required to have sufficient foreign reserves to ensure the convertibility of their monetary obligations. However, in a CBS, the convertibility is valid for monetary base (M0) only. Broader money supply measures such as M1 (currency in circulation + demand deposits) or M2 (currency in circulation + demand deposits + time deposits) do not require 100% reserves (Schuler 2001). Therefore, commercial banks must rely on their own limited reserves and as a result the banking system may be vulnerable in the case of massive deposit withdrawals. Their occurrence may lead to bank runs, as the CBS is not a lender of last resort (a pure CBS prohibits this function). The risk of this is particularly significant in countries where capital mobility is high but banks have limited access to foreign funds, or in countries with weak banking systems.

The CBS, like any fixed exchange rate system, is also vulnerable if there is a large outstanding stock of short-term government debt, even if the current fiscal deficit is low. When government debt becomes an important factor of the economy's liquidity, speculative attacks may prevail. Furthermore, while a CBS rule-based condition may invite more long-term capital than other systems, capital inflows can, however, also lead to a massive credit expansion, which is often followed by compromising credit quality.

Loss of Central Bank Function

The restrictions imposed on currency boards suggest that they are unable to perform certain functions done by a central bank, particularly those related to monetary management and payments system. From a monetary management perspective, a CBS's operations are very limited. "Its holdings of excess foreign reserves limits its capacity to serve as a lender of the last resort or to conduct open market operations, deposit auctions, or other actions that

alter the supply of the monetary base. By design, it cannot independently influence employment, prices, and interest rates in its economy or the volume of money, credit, and capital flows" (Kopcke 1999, pp. 25-26).

From a payment system perspective, in a modern CBS, the settlement services for commercial banks are provided by the central bank, when the latter acts as a currency board, or, by the private sector, where no central bank exists. Some problems may emerge when the CBS does not provide banks with the opportunity to settle their books. In particular, this increases the risk of settlement failures, because the CBS is unable to provide lender of last resort services.

5. Fiscal Policy

The exogenous money supply in a CBS restricts the government's fiscal operation. In fact, in a CBS, fiscal discipline is needed to support it. When fiscal policy responds in accordance with changes in domestic business conditions, it can help stabilise economic activity. Lack of fiscal discipline, on the other hand, can undermine a currency board's fixed exchange rate. According to Williamson (1995), the key question is whether the fiscal authority will agree to be disciplined. To establish a CBS without the fiscal authority of accepting its back-up role, is to risk the whole system that is followed ultimately by national bankruptcy

The quantity-theoretic approach as a part of monetary theory, has been used widely to describe fluctuations in price levels. However, this approach has been challenged by the fact that financial innovation can affect cash management. As a consequence, velocity cannot be assumed to be constant, and becomes more difficult to predict. Another criticism centres on the quantity theory's small degree of success in explaining the history of postwar US inflation. According to Cochrane (1998), US inflation has a weak relationship with the history of monetary aggregates or interest rates. Moreover, money demand relations are frequently driven by "velocity shocks", unrelated to changes in financial structure. As an alternative, Cochrane proposes a fiscal theory pertaining to the price level.

In order to examine and analyse this theory, the present value form of the price level determination equation for a frictionless economy is presented as follows:

$$\frac{B_{t-1}(t)}{p_t} = E_t \sum_{j=0}^{\infty} \frac{1}{r^j} s_{t+j} \quad (2)$$

Where $B_{t-1}(t)$ represents the nominal government debt outstanding from period t-1 and due in period t plus the monetary base in period t-1; p_t is the price level; r is the expected real return of government bonds, which is assumed to be constant; s_t is the real value of fiscal surpluses,

which are equal to the net real taxes (net of government spending and transfers), and E_t represents time-t conditional expectations.

Equation (2) determines the sequence of p_t given an exogenous sequence of surpluses s_t and of nominal debt and monetary base $B_{t-1}(t)$. Since nominal debt is predetermined, the price level adjusts to equate the real value of nominal debt with the present value of the surpluses that will offset it. According to Cochrane, this equation determines the price level and is parallel to equation $MV = PY$, which determines the price level in quantity theory. The main difference, however, is that the fiscal equation is not affected by open market operations.

$B_{t-1}(t)$ includes both government bonds and base money. Therefore, the price level is unaffected if the government pays off some maturing bonds with base money and if this cash rather than maturing bonds is used for transactions and tax payments. Thus, open market operations have no effect whatsoever on the budget constraint, and hence, on the price level.

The fiscal theory of the price level conforms well to a gold standard and a CBS, which promises the stability of price levels or exchange rates with the required backing of real resources to ensure credibility. The real resources include the future tax revenues of the government plus the reserve currency holdings of the currency board. Asset backing, on the right side of the budget identity in commodity or gold standard regimes and the CBS is used to guarantee that budget constraints can always be maintained at the promised price level.

Cochrane stresses that it is the overall government budget constraints that really matter, not the backing of the currency. Thus, from the perspective of fiscal theory it is important to include overall real resources (s_t) on the right hand side, not just whatever resources are explicitly allocated and reserved for backing. In fact, the need for explicit backing depends on the governments' financial condition. A government with sound finances can peg an exchange rate or implement commodity standards with few reserves, buying reserves on the spot market as needed, raising taxes, selling real assets or borrowing against future surpluses to do so.

Moreover, the government must back the entire stock of nominal debt, not just whatever currency is currently outstanding as in the case of a CBS. Based on this view, all government debt must be written on the left-hand side, not just currency or the monetary base. The underlying reason for this is that if the currency outstanding is fully backed, but there is a large amount of maturing nominal debt relative to real assets and current and future real budget surpluses, the backing promise or peg is not credible.

Even though Cochrane states that a fixed exchange rate does not matter, he nevertheless admits that an official exchange rate will make an application of the theory easier. The credibility of a promise made by the government can be evaluated given current and future government revenues. In cases where promises are implicit, their credibility may be assessed

by examining the actual history of overall surpluses as an indicator of whether or not the price level corresponds to its fundamental backing. Thus, according to this theory, fully backing the monetary base with reserve currency as occurs in a CBS is not sufficient to deliver credibility, if the nominal debt outstanding and the current and future fiscal surpluses are neglected.

EMPIRICAL FINDINGS

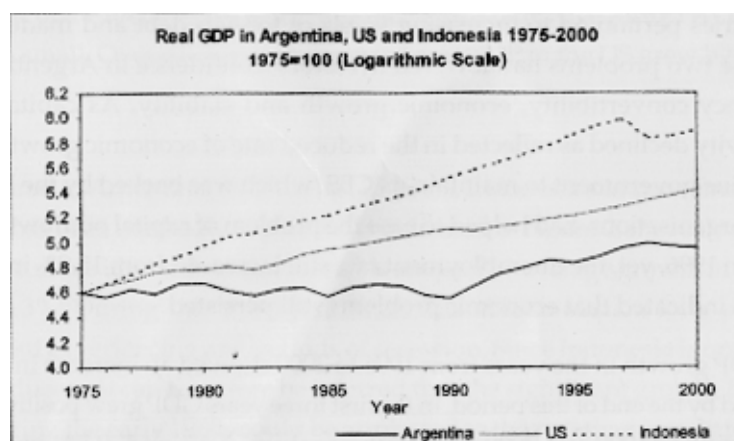
Having reviewed the theoretical aspects of the CBS in the previous chapter, the next chapter presents the empirical findings. This chapter consists of four parts: first GDP growth and business cycles; second, interest rates; third money and inflation; and finally the money hypothesis vs. the fiscal hypothesis of inflation.

1. GDP Growth and Business Cycles

Argentina

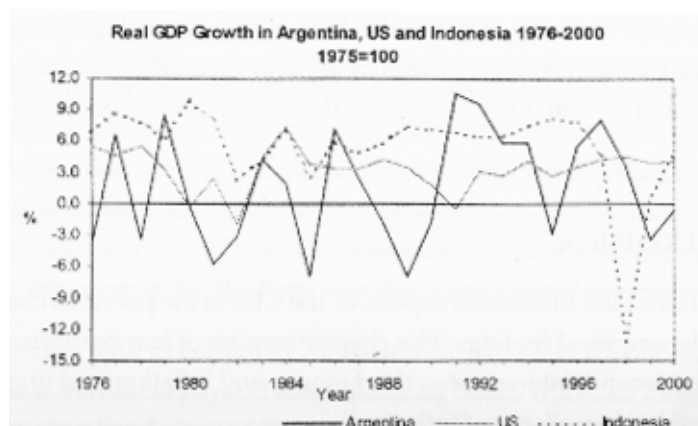
Argentina's real GDP growth over the past 25 years has been relatively poor particularly in the first fifteen years of this period when the economy endured a period of stagnation. From 1975 to 1990, GDP declined steadily as revealed in Figure 2. The average growth in GDP from 1976 to 1990 was -0.2%, during which time there were 9 years of negative growth in GDP (see Figure 3). Thus, during these periods the country's business cycles were dominated by recessions. It was not until 1991 that Argentina experienced substantial improvement in its GDP, as shown in the figure.

Figure 2



Source: Calculated from IFS CD-ROM

Figure 3



Source: Calculated from IFS CD-ROM

The major turning point for Argentina occurred in early 1991 when the country adopted a CBS, and, in fact, up to 1994 Argentina continued to experience positive growth. In the five years after adopting this system, Argentina's GDP grew at an average rate of 5.8%. Nonetheless, in 1995 the country experienced a recession, which may be largely attributed to the impact of Mexico's financial crisis in late 1994, which led to the devaluation of the Mexican peso.

Several Latin American countries experienced the Mexican financial crisis and its contagious adverse effects. Argentina was, nevertheless, one of the most severely affected countries, as reflected in the financial panic that emerged, and which resulted in significant outflows of capital during the first few months of 1995.

The negative reactions by investors were likely due to two important similarities between the two countries pertaining to increasing levels of foreign debt and inadequate foreign reserves. These two problems had lowered investors' confidence in Argentina's ability to sustain currency convertibility, economic growth and stability. As capital flowed out, economic activity declined as reflected in the reduced rate of economic growth. Assurances by the Argentine government to maintain its CBS, which was backed by the IMF and other international organisations, had helped to ease the problem of capital outflows. GDP growth was restored in 1996, yet, the unemployment rate still increased from 15.9% in 1995 to 16.3% in 1996, which indicated that economic problems still persisted.

Real GDP growth in the years from 1996 to 2000 showed an increase in the beginning but deteriorated by the end of this period. In the first three years GDP grew positively. However, since GDP growth in 1999 and 2000 were both negative, -3.4% and -0.5% respectively, and sustaining this growth clearly proved to be difficult. Furthermore, in 2001 the recession

continued with GDP growth in the first three quarters as -2.8% (not shown in the figure). These periods of negative economic growth that began in 1999 were triggered by the devaluation of Brazil's currency. Thus, Argentina's real GDP growth, which in the early 1990s had shown steady improvement, reverted to negative growth towards the end of the decade.

Brazil's devaluation, in effect, made its exportable goods relatively cheap and, hence, more competitive than Argentina's, and Brazil is one of Argentina's principal trading partners. Argentina's imports from Brazil in 1998 reached 22.3% of its total imports, while imports from US were 19.8%. Argentina's exports to Brazil in 1998 represented 30.1% of its total exports, while exports to US were 8.4%. Strong similarities exist between the major exportable goods produced by both Argentina and Brazil; they are food and live animals, as well as machinery and transport equipment.

Argentina and US

From 1975 to 2000 the performance of the US economy easily outstripped Argentina's, real GDP in the US moved steadily upwards as shown in Figure 1. Despite this, during 1976 to 1990 period, US experienced two recessions as shown in Figure 2. The first recession began in 1980 as a result of increases in the price of world oil; GDP grew by -0.2% . The growth in GDP fell once more in 1982 by 2.0%, in the aftermath of a worldwide recession. By 1983 the GDP of the US had rebounded and sustainable economic growth continued from then on, until 1990.

The period of sustained economic growth in the US from 1991 to 2000 in fact began with a mild recession in 1991, which was quickly overcome in the following year. Furthermore, compared to the adverse effects on Argentina's GDP growth, the effects of the financial crisis in Mexico, (one of the members of North America Free Trade Area (NAFTA)), on GDP growth in the US was small. Overall, during this period real GDP in the US grew by 3.2%.

Indonesia

Compared to Argentina, over the last 25 years, Indonesia's improvement in the rate of GDP growth has been markedly superior. As indicated in Figure 2, the real rate of growth in GDP tended to move upwards in a more stable shape. The average growth in GDP from 1976 to 1990 was 6.3%. During this time, Indonesia was able to sustain long periods of GDP growth without experiencing any periods of recession. Since Indonesia is one of the world's major oil producers, it can therefore be inferred that the significant growth that occurred in Indonesia during the early 1980s could be attributed to the revenues generated by the boom in world oil prices, which occurred during the same period.

The years 1991 to 1997 show a continuous improvement in Indonesia's GDP. Nonetheless, Indonesia experienced a severe economic downturn in 1998, following the Asian financial crisis that hit Thailand, South Korea, the Philippines, as well as Malaysia. Moreover, the unfavourable prevailing economic conditions in Indonesia were aggravated by an upsurge in social and political instability. GDP growth was recorded as -13.1% in that year. It was the first and the worst recession recorded in Indonesia in 25 years. The rate of growth in the years following have shown a significant recovery from the previous recession with GDP growth in 1999 and 2000 at 0.8% and 4.8% respectively. The high instability in the exchange rate, which was reflected by high fluctuations in the value of the Rupiah, was one of the principal obstacles to restoring economic growth. The subsequent stabilising of the Rupiah has helped the economy to improve its performance.

2. Interest Rates

Interest rates referred to in this paper use two indicators. The first of these indicators are deposit rates, which can take the form of time deposit rates or Certificates of Deposit (CD). The main difference between time deposits and CDs is the saleable, and hence, negotiable nature of the CD in the secondary market. As the CD is saleable before it matures and usually is in larger denominations than time deposits, financial institutions or large corporations usually buy it as an alternative asset to Treasury Bills and other short-term bonds. Time deposits on the other hand cannot be sold and come in smaller denominations; thus, the majority of depositors interested in them are the general public. Argentina data uses the average rate offered on 30-day to 59-day time deposits. Indonesia data uses the weighted average rate paid on three-month time deposits at commercial banks, while the US uses 3-month CD rates in the secondary market.

The second indicator utilised in this paper refers to the money market rate, which is the cost of funds borrowed from other financial institutions in the money market. The money market instrument referred to here is defined as inter-bank loans (or 'Federal Funds' in US). An inter-bank loan is one of the sources of liquidity for commercial banks that experience short-term liquidity problems. The main difference between the money market rates data used for each country in this paper is in regards to the different dates of maturity. In the case of Argentina the average date of maturity is up to 15-days for loans between domestic financial institutions, while in the US and Indonesia money market rates are based on one-day loans between commercial banks.

Argentina

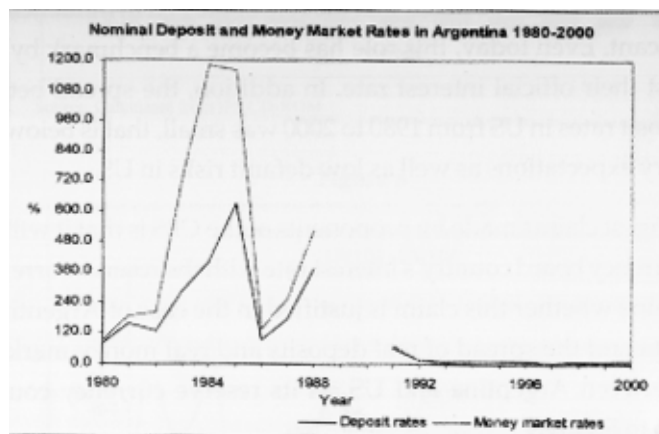
Argentina's deposit rates from 1980 to 2000 period show a significant decline only after 1990 (see Figure 4). In the period before 1991, most of the time the deposit rates and

money market rates were at three-digit rates. Extraordinarily high real interest rates were recorded in 1989 and 1990 when the deposit rates reached 17,236.0% and 1,517.9% respectively. Even the money market rates reached 1,387,180.0% and 9,695,420.0% respectively in each of these years. The high level of interest rates mainly resulted from high inflationary expectations and high default risks in Argentina.

The spread between deposit rates and money market rates from 1980 to 1990 in Figure 4 also show broad differences most of the time. This discrepancy between the deposit rates and money market rates indicates that at least two banking problems confronted Argentina's economy during these periods. First, the costs of funds in Argentina were very high, as inflationary expectations were also high. Second, the financial system was experiencing severe liquidity problems or even worse insolvency problems because the high interest rates had continued for ten years. Thus, the banks' intermediary function was restricted because the default risk was high.

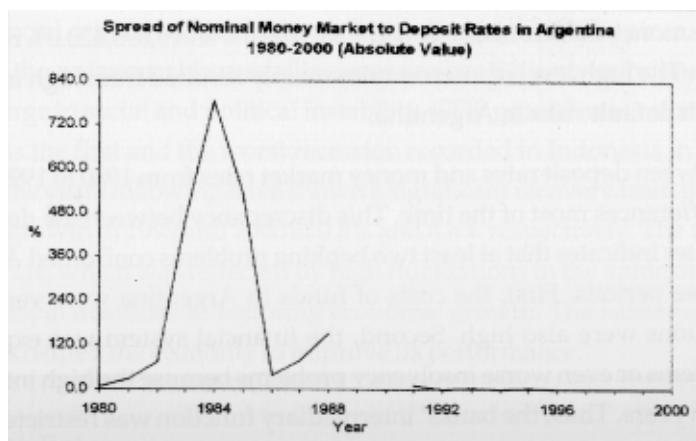
After the CBS was adopted in 1991, inflationary expectations were successfully dampened and the nominal interest rate was brought down immediately. Consequently, the spreads between money market and deposit rates in 1991 to 2000 were much smaller compared with the 1980 to 1990 periods (Figure 4). Nonetheless, the deposit and the money market rates in 1995 increased from the previous year, following the financial crisis in Mexico. Moreover, since 1997 interest rates have also tended to increase again.

Figure 4



Source: Calculated from IFS CD-ROM
Excluding 1989 and 1990 data

Figure 5



Source: Calculated from IFS CD-ROM
Excluding 1989 and 1990 data

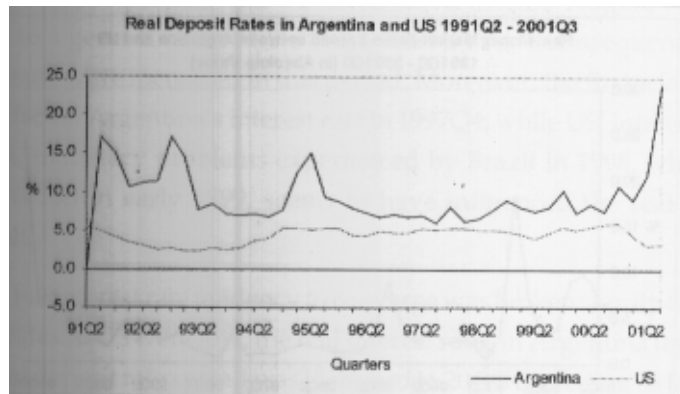
The Convergence of Argentina's Interest Rate with Interest Rates in US

The US's deposit and money market rates data from 1980 to 1990 show that only the periods from 1980 to 1982 were marked by relatively high rates compared to the other years even though they were still much lower than interest rates in Argentina during the same period. These years were characterised by world oil price inflation. Thus, it is likely that throughout 1980 to 1982 the Federal Reserve (the Fed) increased its interest rates to curb inflationary expectations. It should be noted that the role of the Fed in influencing the market interest rate is significant. Even today, this role has become a benchmark by which many other countries adjust their official interest rate. In addition, the spread between money market rates and deposit rates in US from 1980 to 2000 was small, that is below 0.5%. This is due to low inflationary expectations as well as low default risks in US.

One of the strongest claims made by proponents of the CBS is that it will facilitate the convergence of the currency board country's interest rate with the reserve currency country's interest rate. To examine whether this claim is justified in the case of Argentina's CBS, the trend of quarterly data and the spread of real deposits and real money market rates from 1991Q2 to 2001Q3 between Argentina and US, as its reserve currency country, will be presented in Figures 6 to Figure 9.¹

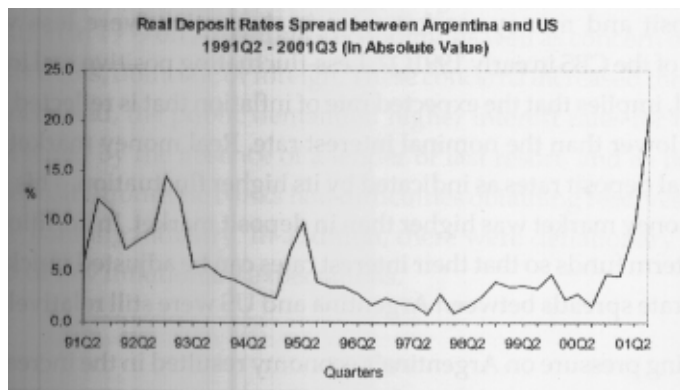
¹ Real interest rates measured here are ex-post real interest rates, which are obtained from nominal interest rates subtracted by actual inflation in the same year.

Figure 6



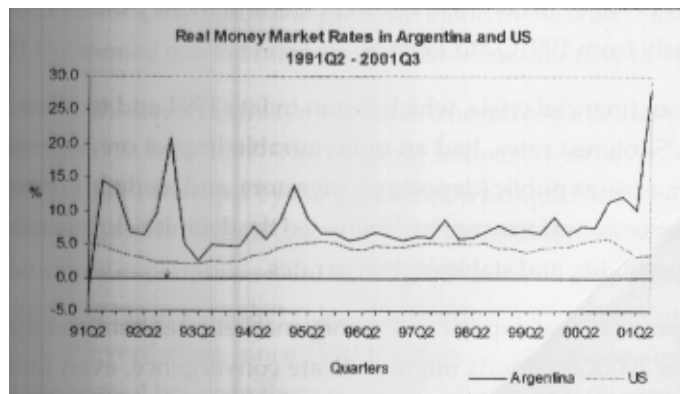
Source: Calculated from IFS CD-ROM

Figure 7



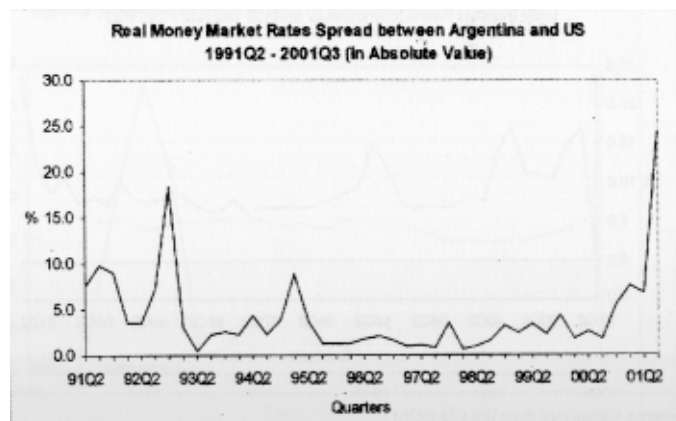
Source: Calculated from IFS CD-ROM

Figure 8



Source: Calculated from IFS CD-ROM

Figure 9



Source: Calculated from IFS CD-ROM

Real deposit and money market rates in Argentina were less volatile after the implementation of the CBS in early 1991Q2. Less-fluctuating positive real interest rates in the following period, implies that the expected rate of inflation that is reflected by the actual rate of inflation was lower than the nominal interest rate. Real money market rates were more sensitive than real deposit rates as indicated by its higher fluctuation. This indicates that the default risk in money market was higher than in deposit market. In addition, money market funds are short-term funds so that their interest rates can be adjusted quickly. Nevertheless, the real interest rate spreads between Argentina and US were still relatively high.

The growing pressure on Argentina's economy resulted in the increase of real interest rate spreads between the two countries in 1992Q4. The real money market rate spread increased to 20.8% from just 9.7%, while the real deposit rate spread increased to 17.2% from 11.4% in the previous quarter. After this period, however, Argentina's real interest rates tended to go down again until 1994Q4. In contrast, US' deposits and money market rates tended to stay lower continuously from 1991Q2 to 1994Q4.

The Mexican financial crisis, which began in late 1994 and to some degree related to the increase in US interest rates, had an unfavourable impact on Argentina's real interest rates. This matter arose as public (depositors, investors, and lenders) concern over the future of Argentina's economic performance had increased the default risk, regardless of the regime's promises of convertibility and stable exchange rates.

The low spread in real deposit and money market rates between the two countries in the 1995Q3 to the 2000Q3 periods might indicate convergence, even though it sometimes fluctuated during these periods. Slight fluctuations in the spread during these periods were

most likely caused by social and political problems in Argentina as well as economic shocks. The fiscal tightening programme that was announced in early August 1996 to reduce the fiscal deficit led to a general strike at the same time, and as a consequence of this the real interest rate spreads were increased in this period. Moreover, the financial crisis in Asia, in mid 1997, also affected Argentina's interest rate in 1997Q4, while US' interest rates remained low. In addition, monetary problems experienced by Brazil in 1998, which preceded its currency devaluation in early 1999, seems to have influenced the real interest rates in Argentina as well.

However, the interest rate tendency to converge was broken shortly afterwards. While the real interest rates in US were low, the real interest rates in Argentina tended to increase. By 2001Q3 the real deposit rate spread was increased to 20.7% exceeding its level of 5.7% when the CBS was first introduced in 1991Q2. The real money market rate spread also behaved in the same way; it increased to 24.4% in 2001Q3 well above its level of 7.6% in 1991Q2.

The real interest rates rose as there was a growing concern about the impact of Brazil's currency devaluation in 1999 on Argentina's economy, as well as concern over Argentina's ability to service its debts, domestic or foreign. These concerns increased the default risk. As the default risk increased, the public demanded higher interest rates for their funds. The problem was worsened by the absence of a lender of last resort, and as people started to withdraw their deposits, domestic banks had difficulties obtaining reserves due to the high default risk of the banking industry. In addition, there were deflationary expectations in Argentina instead of low inflationary expectations.

Indonesia

In comparison to Argentina, the interest rates in Indonesia were much less volatile from 1980 to 1996 (Figure 10). The inflationary expectations during this period were moderate and the default risk of the banking industry was perceived to be low. The deposit rate increased significantly in 1991 to 23.3%, but tended to go down again in the subsequent years. On the other hand, in 1991 the money market rates only increased moderately to 14.9%.

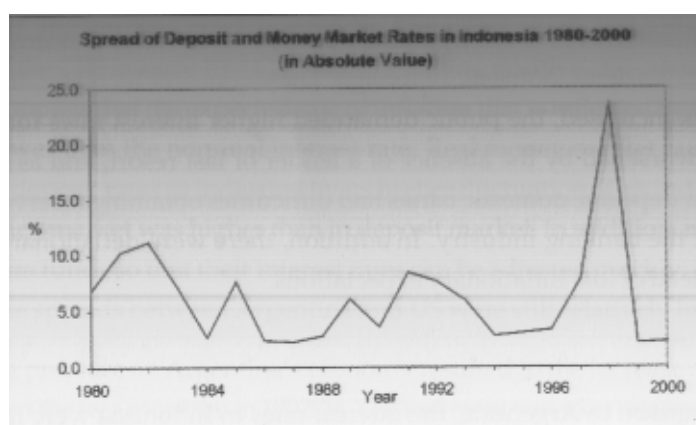
In 1998, Indonesia's interest rates skyrocketed as a negative consequence of its financial crisis, which commenced in mid 1997. The banking industry was severely hit due to its structural weaknesses. Initial attempts by the government to liquidate some troubled banks in late 1997 resulted in a higher default risk of domestic banks since there was no deposit insurance. The inflationary expectations were also high. Deposit rates were sharply increased to 39.1% in 1998, and the money market rates climbed to 62.8%, which made the spread between them 23.7%. Nevertheless, since 1999 the deposit and money market rates had become lower and the spread between them was only 2.2% in 2000 (Figure 11). The central

Figure 10



Source: IFS CD-ROM

Figure 11



Source: Calculated from IFS CD-ROM

bank role in this case was important, by setting the interest rate of the Bank of Indonesia Certificates as a benchmark for commercial interest rates, as well as using it as an open market operation tool to curb the inflation.

3. Inflation and Money

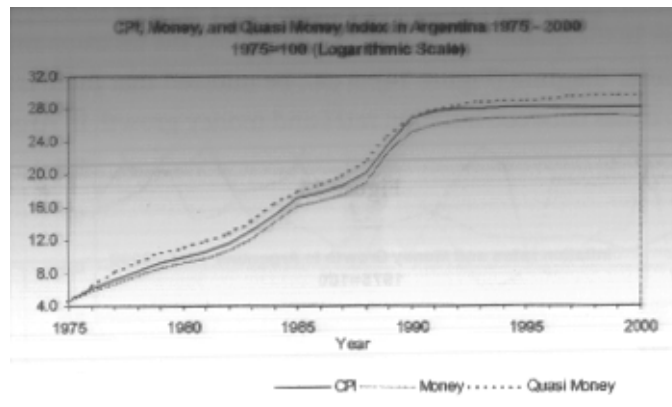
Argentina

Argentina's CPI increased quite quickly from 1975 to 1988. Moreover, in 1989 and 1990 there were sharper increases in the CPI. Overall, the average inflation rate from 1976 to 1990 was 595.1%. As the rate of inflation remained at three digit levels for most of the time in

1976 to 1988, Argentina was in a near-hyperinflation condition. In 1989 and 1990 Argentina actually entered a period of hyperinflation as the annual inflation rates reached four digits, 3,079.8% and 2,314.0% respectively. In other words, the rate of inflation in both years exceeded 150% per month. The situation implies that both monetary and fiscal authority of Argentina could not perform well in controlling the inflation. This might be due to incompetence of either authorities, or dependency of the monetary authority towards the government, or political pressures.

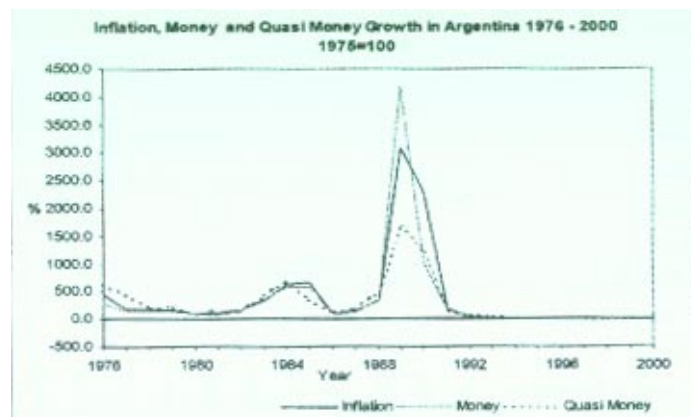
From 1991 to 2000, Argentina's CPI was stable, which can be seen in Figure 12 from its flatter shape. Overall, the average rate of inflation from 1991 to 2000 was 21.4%. Thus, following the implementation of the CBS, which limited the growth in the supply of money, inflation was contained. In fact, the rate of inflation, which in the two previous years had

Figure 12



Source: Calculated from IFS CD-ROM

Figure 13

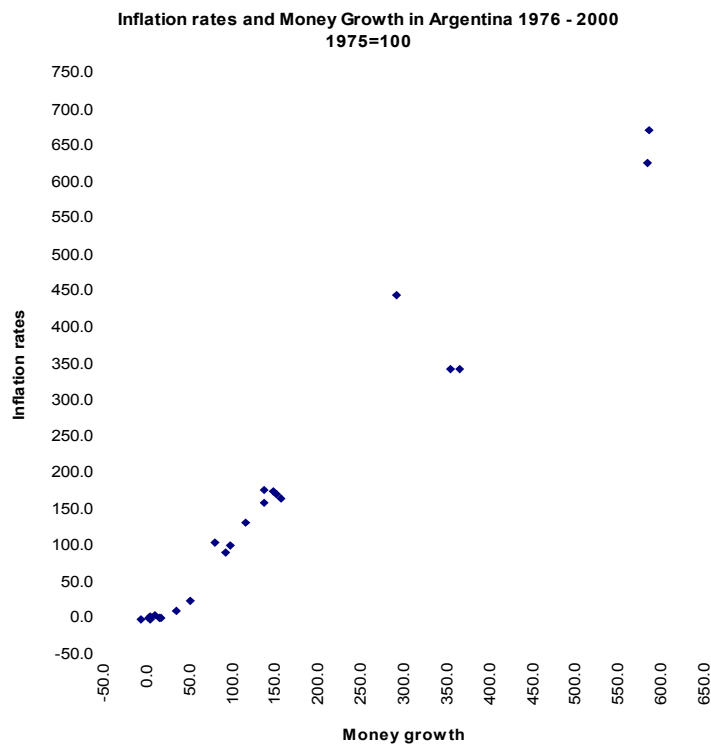


Source: Calculated from IFS CD-ROM

reached four digits, was brought down to 171.7% in 1991. Furthermore, in the four subsequent years inflation rates declined further to single digit in 1994 and 1995.

From 1996 to 1998, the rates of inflation were near to zero; the average inflation rate in this period was only 0.5%. In 1999 and 2000, inflation declined further, below zero, and Argentina experienced deflationary conditions; deflation rates were -1.2% and -0.9% respectively. Moreover, inflation rates, which fluctuated greatly from 1976 to 1990 and then declined from 1991 to 2000, tended to mirror changes in the growth in money and quasi money. In the same way it occurred when the conditions of hyperinflation were established in 1989 and 1990; as the money and the quasi money grew by four digits, inflation rates reached four digits as well. As the growth in money and quasi money declined in 1991 to 2000, so did the rate of inflation. With the above in mind, it can be seen that movements in inflation rates in relation to the movements of money and quasi money as shown in Figure 13, conform to the quantity theory of money, according to which movements in the price level result from changes in the quantity of money. By matching the inflation rates to the money growth using a scatter diagram (Figure 14), it can be inferred that there is evidence that a linear relationship exists between inflation rates and money growth in Argentina.

Figure 14



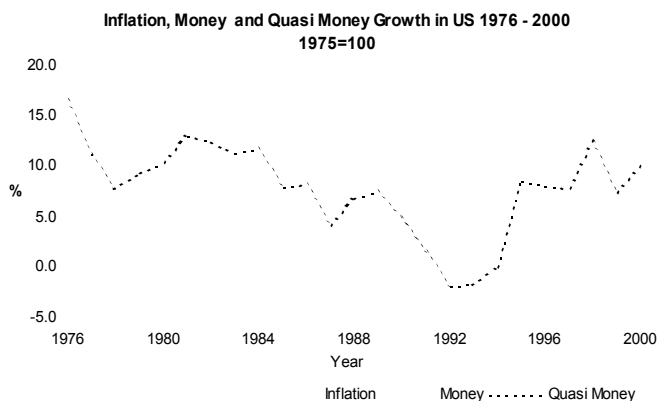
Source: Calculated from IFS CD-ROM , Excluding 1989 and 1990 data

Inflation in Argentina and US

Figure 15 pertaining to rates of inflation in US, shows that after 1980 inflation rates sloped downwards. There were only three periods when inflation rates exceeded one digit, which were in the years 1979 to 1981. These periods were affected by shocks reverberating from the dramatic increase in world oil prices. Unlike Argentina, inflation in US, did not particularly influenced by movements in money and quasi money. Hence, in regards to inflationary patterns in US, evidence that might substantiate the quantity theory is weak.

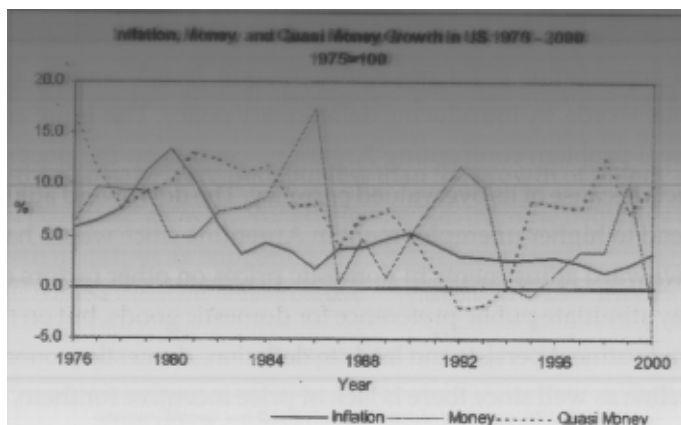
Another claim made by the proponents of the CBS system is that its adoption will facilitate conditions of low inflation. In the case of Argentina, as presented in Figure 16 below, which uses quarterly data from 1991Q3 to 2001Q3, this claim at some point appears

Figure 15



Source: Calculated from IFS CD-ROM

Figure 16



Source: Calculated from IFS CD-ROM

to have been substantiated. Argentina's inflation rates tended to decline and stayed at low levels, which were close to the low inflation rates experienced in US.

However, as can be seen in the figure, besides having low inflation, Argentina also experienced near zero inflation and more frequent deflationary periods after 1995Q4. On the other hand, inflation in US tended to be in a more stable condition, except in 2001Q3. With this in mind it can be seen that besides bringing the rate of inflation down to low levels, the adoption of a CBS in Argentina also produced periods of deflation as well.

The deflationary conditions that emerged in Argentina were a consequence of the inflexibility and over valuation of its nominal exchange rate, which was fixed to one peso for one US dollar. A high nominal exchange rate will result in a high real exchange rate as well. In turn, the high real exchange rate will pose disadvantages for Argentine exports that are mainly comprised of primary goods. In general, the relative price of its exportable goods has become higher than the average world price. To overcome this problem, Argentina must commence a real depreciation of the pesos that can only be achieved by a fall in domestic prices, or in another words, by introducing deflationary policy. This is not an efficient policy, however, if the real problem confronting Argentina centres on the uncompetitiveness of Argentine products because of its overvalued currency. The downward adjustment in prices, is highly likely lead to higher unemployment in Argentina since wages have a downward inflexibility. Downward adjustments in domestic prices on other factors except wages on the one hand, may stimulate public preference for domestic goods, but on the other hand, if this downwards adjustment persists and leads to deflation, domestic economic and business activities will decline as well since there is lack of price incentive for them.

Furthermore, in the light of the above, one may recall the destabilising effect of deflation. Any decline in price levels will depress income rather than raise it, regardless of whether or not those decreases are expected. In the case of expected deflation, the ex ante real interest rate in Argentina will increase if the market's expectation of deflation is built on given nominal interest rates. The increase in real interest rates in turn will depress scheduled investment expenditure, which will cause a decline in Argentina's income. As gross fixed capital formation in Argentina, which is assumed to represent the level of investment activity, declined from 1998 to 2000 by 23.9%, Argentina experienced negative GDP growth.

In the case of unexpected deflation, deflation redistributes the wealth of borrowers to lenders. This in turn will lower the debtors' spending on goods and services on the one hand, and on the other hand increase the lenders' spending. By assuming that the marginal propensity of the borrowers to consume is higher than the lenders, the net effect is likely to be a decline in spending, which may then reduce Argentina's aggregate income.

Indonesia

In contrast to Argentina, Indonesia's inflation rates from 1976 to 1990 were much lower, with the average inflation rate running at 10.6%. From 1991 to 2000, Indonesia was able to maintain a one-digit inflation rate until 1997. However, a significant departure from this rate occurred in 1998 during the Asian financial crisis. The inflation rate in Indonesia soared to 57.6% in that year. Subsequently, the rate of inflation decreased in the years following.

Inflation in Indonesia (see Figure 17) does not necessarily seem to be influenced by movements in money and quasi money, even though sometimes it moves in the same direction as both of them, as happened in 1980. There were periods in 1985 and 1989, when inflation rates moved in the opposite direction to the growth of money and quasi money. Thus, the evidence of the quantity theory is not substantial in Indonesia's situation. The scatter diagram in Figure 18, which plots the inflation rate to the money growth confirms this conclusion.

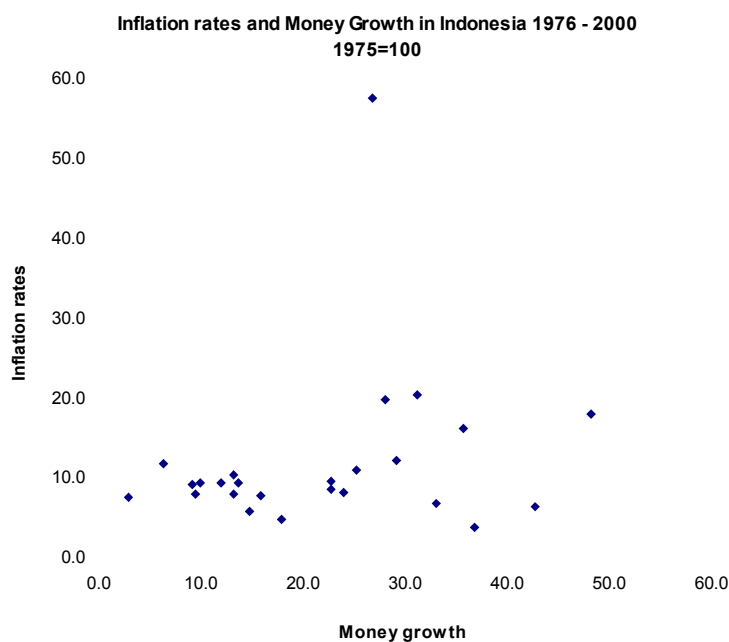
Money and quasi money growth also tended to exceed inflation most of the time. This is understandable, as the Indonesian economy grew, the demand for money increased as well. Inflation might also have increased, but less than the growth of money since output also grew as a signal of economic growth. Nonetheless, when increase in money demand was not followed by growth in output as happened in 1998, inflation rose.

Figure 17



Source: Calculated from IFS CD-ROM

Figure 18



Source: Calculated from IFS CD-ROM

4. The Money Hypothesis vs. the Fiscal Hypothesis of Inflation

The quantity theory of money is able to describe the movements in Argentina's inflation. Thus, from the fiscal theory perspective the fiscal theory of price levels is inferior in regards to its ability to explain fluctuations in the price level in Argentina. However, examining the fiscal conditions in Argentina and comparing them with fiscal conditions in Indonesia is a valuable exercise, which should provide an insight into its role in supporting any regime.

In general, the fiscal condition in Argentina has improved since 1988 (see Figure 19). Even during the period from 1991 to 1993, the average budget surplus over GDP was 0.4%. In particular cases, such as in 1995 after the financial crisis in Mexico in late 1994, the budget deficit to GDP ratio in 1995 was increased to only -1.2% from -0.2% in 1994. This was due to tight controls on government spending that increased by only 1.2% from 1994 to 1995 as a fiscal adjustment to the crisis. Total Argentinean revenue in 1995 declined by 5.5% because of the decline in tax revenue, which resulted from a decrease in incomes and profits. Nonetheless, Calvert (2000, p. 58) proposes an alternative view, according to which continuing widespread tax evasion also caused the decline in tax revenue. In fact, the tax revenues in 1996 declined by a further 6.1% compared to 1994.

Figure 19

Sources: Calculated from Government Finance Statistics Yearbook and IFS CD-ROM
Indonesia data in 2000 is not available.

In fact, the fiscal theory prediction concerning the collapse of a regime if there is a large stock of maturing nominal debts relative to real assets and current and future real surpluses, even if the currency outstanding is fully backed, is still applicable in Argentina. In the second significant economic downturn in 1999, which led to the abandonment of the CBS in early 2002, Argentina had run out of financial support from international organisations. Even though the currency outstanding was backed and inflation was controlled, Argentina has a mounting debt figure. Around one-fifth of its total debt from 1995 to 1998, comprised of short-term debt; and because it was not balanced by significant real resources improvement it created discouraging expectations about the country's future surpluses.

Fiscal conditions in Indonesia have also shown an improvement since 1990. In 1995 the national surplus to GDP ratio was 2.2%; with the average surplus to GDP ratio from 1990 to 1996 being 0.8%. In contrast to Argentina, Indonesia's tax revenue increased constantly; even during the economic crisis in 1997 to 1998 the tax revenue still increased by 42.2%. Government expenditure, however, grew by 57.2%, which resulted in a fiscal deficit. Nonetheless, its ability to generate more revenues, especially in periods of crisis creates a reasonable expectation of more surpluses in the future. With respect to the fiscal hypothesis of inflation, a further study can be carried out to estimate whether it is applicable to Indonesia, which is beyond the purpose of this study.

CONCLUSIONS

- Economic growth in Argentina substantially improved after the CBS was adopted in early 1991. Nevertheless, this economic growth proved to be sensitive to external shocks. Hence, the long-run sustainability of Argentina's economic growth since the introduction of the CBS is questionable.
- The claim made by advocates of the CBS that interest rates in Argentina would converge with those in US were accurate as shown by the lower spread between real deposit and money market rates. However, the tendency to converge was broken since the default risk in Argentina remained high and Argentina had deflationary expectations instead of low inflationary expectations.
- The hyperinflation conditions, which had prevailed in Argentina, were quickly reversed after the CBS was implemented in 1991. Thereafter, Argentina entered a period of low inflation comparable to the low inflation rate that prevailed in US. Hence, the assertion that a CBS facilitates low inflation has some basis in the light of the Argentine experience. However, in the late 1990s, Argentina experienced deflations as a consequence of over-valued fixed nominal exchange rates. Thus, a higher real exchange rate led to a decline in domestic prices as well as domestic economic activity.
- To support any regimes, sound fiscal policy such as debt and tax management is needed. However, as in Argentina's experience with its CBS, fiscal discipline is not tenable.
- The absence of lender of last resort is an institutional weakness of the CBS.

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