Drivers of Financial Dollarization in Suriname

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ABSTRACT

Suriname has experienced substantial financial dollarization since the mid 1990s. Although dollarization is typically triggered by macroeconomic instability, it may persist long after macroeconomic stability has been restored. The objective of this paper is to determine if, or to what extent, dollarization theories hold in the small open Surinamese economy. To this end, potential drivers are tested with respect to their significance in explaining financial dollarization, i.e. dollarized deposits and loans, in Suriname. Even though the economy is highly open, the econometric results suggest that trade openness has not driven either type of financial dollarization. Also, economic growth, as an indicator of increased confidence in the economy, is not significant in explaining dollarized deposits. The price level, the real deposit rate, the lending rate differential and the official exchange rate, on the other hand, prove to be notable drivers.

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1. Introduction

Dollarization is a common feature of developing economies with a history of high inflation (Baliño et al, 1999) and can be defined as a portfolio shift away from domestic currency to foreign currency, typically triggered by unstable macroeconomic conditions (Bogetic, 1999). Still, dollarization is known to persist long after macroeconomic stability has been restored. This irreversibility, or 'hysteresis', is usually due to the habituation of the general public to use foreign currency, the costs for economic agents to (re)convert foreign into local currency, but also due to the asymmetric reputation of the two currencies involved (Yotopoulos, 1997). Menon (1998) argues that 'dollarization is not the *problem*, but merely a *symptom*.' The real problem is a lack of confidence in the national currency, whereas the symptom is the use of another currency.

The objective of this chapter is to determine if, or to what extent, dollarization theories hold in the small open Surinamese economy. The theories in question are: (i) time inconsistency of monetary policy, (ii) institutional changes, (iii) small economy in a globalizing world, (iv) increased confidence in the economy, (v) portfolio considerations and (vi) risk miscalculation and warranties. These drivers will be considered with respect to their validity in explaining financial dollarization, i.e. dollar-denominated deposits and loans (Berg & Borensztein, 2000).

The significance of the theories will be substantiated by theoretical arguments, empirical considerations and econometric analysis. Typically, theory or experience will suggest an expected sign for each individual driver. To gain an appreciation for the origin of dollarization in Suriname, some macroeconomic background information will be provided. This will make clear how the unstable macroeconomic conditions, under which dollarization has emerged, have developed.

The paper is organized as follows. First, a section is devoted to theories that constitute potential drivers of dollarization within the context of a small open developing economy. Second, a brief overview of the financial system and relevant macroeconomic developments in Suriname is provided. The degrees of deposit and credit dollarization are then examined to determine to what extent the financial system is dollarized. Third, the significance of the aforementioned drivers is determined by testing associated indicators in an empirical model.

2. Drivers of financial dollarization

The theories that are likely candidates to explain dollarization in Suriname range from macroeconomic instability to de facto fixed exchange rate regimes that almost appear to be 'guaranteed' by the government. Other drivers include institutional changes, trade openness and portfolio considerations. In general, these are the causes that encourage residents to dollarize their financial assets and liabilities.

2.1 Time inconsistency of monetary policy

The time inconsistency argument is based on the government's urge to reduce the real value of its debt burden (Levy Yeyati, 2003) by monetizing fiscal deficits and eroding the value of money. Dollarization therefore ultimately reflects 'a lack of confidence in the sustainability of a monetary regime' (Ize & Parrado, 2002). The theory broadly explains monetary developments in Suriname in the past decades, where governments have been running deficits that were, in most instances, monetized by the Central Bank of Suriname (CBvS). However, if monetization lasts for protracted periods of time, this will give the country a reputation of high inflation that will ultimately result in a lack of confidence in the domestic currency.

2.2 Institutional changes

Institutional changes, such as the relaxation of a strict foreign exchange regime, may also explain dollarization in small open developing economies, such as Suriname. Incidentally, this theory is not mentioned in the literature, which is probably due to the fact that the dollarization literature is largely neoclassical in nature and therefore by implication market-oriented. This theory, however, refers to a situation where the central bank has previously had a foreign exchange monopoly, which is fairly normal in small open economies that struggle with a structural lack of foreign exchange. Institutional changes in monetary policy and gold trade regimes may also partially explain the domestic growth in dollar deposits.

- *Foreign exchange regime*

In June 1992, the foreign exchange regime was relaxed and domestic banks were allowed to open foreign currency deposits for residents to encourage the repatriation of flight capital that had left the country since the politically instable 1980s. This measure constituted the beginning of financial dollarization. Since July 1995, commercial banks are formally allowed by the CBvS to extend foreign exchange credit. Before this date, the banks were more or less forced to make investments abroad. This practice, however, extracted foreign currency from the economy and destabilized the exchange rate.

In May 2002, another major development occurred when the foreign exchange monopoly of the government was abandoned. Specifically, the foreign exchange surrender requirement was removed. This requirement, which implied the mandatory sale of foreign exchange to the CBvS, was replaced with a requirement to transfer export earnings directly to domestic private foreign currency accounts. Thus, exporters were no longer permitted to

keep their export proceeds abroad. Instead, they were legally obliged to repatriate their foreign exchange earnings, constituting a shift from offshorization to dollarization.

As a result, the economy experienced a sharp increase in deposit dollarization. Initially, the steep rise in dollarization was perceived as a paradox by those who were not privy to the institutional change that had taken effect. This is understandable given the fact that, at the time, the country was amidst a successful macroeconomic stabilization effort, whereas dollarization is typically associated with macroeconomic instability.

- *Reserve requirements*

Since the introduction of reserve requirements on foreign currency deposits in February 2003, there was an aspect of discrimination against reserve requirements on local currency deposits. After all, the required reserve ratio that initially applied to foreign currency deposits was 17.5 percent, whereas the ratio then applying to local currency deposits was as high as 35 percent. This not only constituted an unlevel playing field but also an incentive for financial dollarization due to the lower cost of funds regarding foreign currency deposits. This situation was gradually corrected in the ensuing years.

The turning point was in February 2005, when the reserve ratio for foreign currency was raised to 33⅓ percent, 3⅓ percentage points higher than the local currency ratio at the time. Since then, the local currency ratio has been lowered twice and kept stable at 25 percent from January 2007 onwards. Even though the two decreases may have indirectly discouraged dollarization, they were motivated purely by monetary policy considerations.

In January 2011, however, the reserve ratio for foreign currency was raised to 40 percent as a follow-up effort to discourage foreign currency borrowing. Although the reserve ratio for foreign currency was increased to 33⅓ percent and then further to 40 percent, the fact remains that these reserves may be invested in money markets abroad, while the local currency reserves are to be held at the CBvS in a non-interest bearing account.

- *Gold trade*

In September 2002, the compulsory gold sales of the private sector to the CBvS were abolished. Since then the private sector could freely engage in gold trade and was thus no longer obliged to sell gold to the authorities. Moreover, the gold could be freely exported (Caram, 2007). Thus gold has, since then, merely become another export commodity of the mining industry, licensed to the private sector.

The liberalization of the local gold market resulted in highly increased volumes of gold production and export. The rising export proceeds of gold, subsequently, contributed to deposit dollarization. The result was an increase of foreign currency instruments in the banking system (IMF, 2005). This development, however, only pertains to the small-scale gold mining industry as the only large-scale gold mining company in the country is exempt from transferring export proceeds to Suriname.

2.3 Small economy in a globalizing world

Countries that are more open to trade should be more dollarized, and dollarization should increase with trade integration (Ize & Levy Yeyati, 2003; Luca, 2002). Since smaller countries are likely to be more open, they are also likely to be more dollarized (Ize & Parrado, 2002). This theory naturally applies to Suriname as a small open economy. In fact, the country is so open that the trade-to-GDP ratio[1] is generally in excess of 100 percent.

Due to the high degree of trade openness, zero dollarization would not be a realistic policy objective in Suriname. After all, high trade openness, almost by definition, dictates a policy of low dollarization as the large tradable sector would otherwise unnecessarily be exposed to exchange risk.

2.4 Increased confidence in the economy

When countries that have long been plagued by macroeconomic instability, show signs of improvement, often large amounts of foreign currency flow in (Menon, 2008). However, it is important to note that increased confidence in the domestic economy does not automatically imply increased confidence in the domestic currency. Private foreign currency inflows, e.g. repatriations of flight capital, are therefore likely to remain in foreign currency accounts, at least initially. Conceptually, this constitutes a shift from offshorization to dollarization.

Inflows on account of increased confidence, however, are hard to distinguish from regular inflows. Even if inflows are greater than usual, one cannot be certain if increased confidence is indeed the driver of the additional inflows.

2.5 Portfolio considerations

One of the main explanations for dollarization is provided by the portfolio approach. This theory assumes that economic agents also hold foreign currency assets and liabilities. In this regard, there is wide consensus that financial dollarization is a coping strategy to obtain insurance against surprise changes in domestic prices (Fernández-Arias, 2005). Considering Suriname's history of macroeconomic instability, where dollarization is an effective hedge against inflation, this theory is likely to apply.

Dollarization grows whenever there are no explicit bans on dollar denominated assets. One of the main explanations for this phenomenon is provided by the portfolio approach, which assumes that economic agents hold foreign currency assets and liabilities, either domestically or abroad (Licandro & Licandro, 2003). In June 1992 the Foreign Exchange Commission decreed that residents were not only permitted to hold foreign currency deposits with local banks but also with banks abroad. This, however, also created a legal avenue for offshorization with all its negative implications for exchange rate stability.

An important contributor to financial dollarization is the dollarization of domestic savings. In fact, the domestic intermediation of foreign currency holdings amount to dollarized liabilities of domestic agents and currency mismatches for non-tradable firms,

[1] The sum of imports and exports of goods and services as a percentage of GDP.

the public sector and families (Fernández-Arias, 2005). As mentioned earlier, financial dollarization has grown rapidly in Suriname. When the CBvS allowed the extension of foreign currency credit in July 1995, it was under the strict condition that borrowers should also have a cash flow in foreign currency. In 2003, however, this prudential rule was abandoned, following the introduction of reserve ratios on foreign currency deposits.

2.6 Risk miscalculation and warranties

- *Risk miscalculation*

Government warranties on the financial system stimulate the risk taking behavior of the private sector, resulting in excessive exchange rate positions. As the government covers the risk, it is not priced in the interest rate, and foreign currency credit is perceived as 'cheap' (Burnside et al, 2000). Credit dollarization in Suriname grew extremely rapidly during 2000-03, reflecting the relaxation of institutional constraints. In this period, foreign currency loans quadrupled in real terms as credit ceilings on foreign currency lending were eliminated and restrictions on holding foreign currency deposits were relaxed. Despite the introduction of reserve requirements on foreign currency deposits, lending in foreign currency remained favorable relative to lending in domestic currency (IMF, 2005).

- *Warranties*

In a broad sense, a fixed exchange rate system can be considered a warranty that may give rise to the dollarization of credit under unstable macroeconomic conditions. This is especially so since prudential regulation does not require that banks have more capital if they extend dollar credit to non-dollar earners (Broda & Levy Yeyati, 2003). In fact, the de facto pegged exchange rate of Suriname has given off this signal until very recently. Understandably, widespread currency mismatches make central banks reluctant to officially move the exchange rate or to let it float altogether. Despite this fear of floating, the monetary authorities could no longer resist the increasing exchange rate market pressure, resulting in a devaluation of 20% in January 2011.

3. Financial dollarization in Suriname

The Surinamese economy has experienced substantial dollarization since the mid 1990s and has even exceeded the regional trend toward dollarization with the acceleration in dollarization since 2001 (Fritz-Krockow et al, 2009). Since the economy itself is part of the problem, this section provides the macroeconomic context in which dollarization has emerged. But first, the financial system, the institutional framework wherein financial dollarization has developed, will be reviewed.

3.1 Financial system

The financial system of Suriname is comprised of the Central Bank, 9 commercial banks, 14 insurance companies, 34 pension funds, 5 provision funds, 1 thrift fund, 28 credit unions and 12 other institutions. Moreover, there are 26 licensed exchange offices. The commercial banks are the most important financial institutions, holding roughly 70 percent of the total assets of the financial system. The banking system is highly concentrated as the three largest banks account for more than 80 percent of total bank assets. One of these large banks is a subsidiary of a foreign bank. Another of the large banks is partially state-owned. Furthermore, there are three fully state-owned small commercial banks (Fritz-Krockow et al, 2009). In addition, the government runs a fully-owned development bank. As yet, there is no system of deposit insurance.

The financial instruments in Suriname mainly consist of demand deposits, time deposits, savings deposits, foreign currency deposits, treasury bills and Central Bank gold certificates. The latter are denominated in grams of gold at a 5% annual interest rate. The interest received in Surinamese currency varies with changes in the international price of gold and the official exchange rate (Adhin & Konigferander, 1995). The sale of new gold certificates was discontinued following the 9/11 attacks, which pushed up gold prices and prompted speculation. Other traded securities include the stocks of eleven companies listed on the local Stock Exchange. In addition, the State Oil Company issued bonds to partially finance its investment program.

Traditionally, the instrument of monetary policy has been quantitative credit control through credit ceilings. Restrictive credit policies were the result of a long history of fixed exchange rate arrangements and external current account deficits, whereas the need for direct credit instruments arose from the lack of a domestic capital market (Adhin, 1999). In 2001, the credit ceilings were replaced by reserve requirements. Over the years, the reserve ratios applicable to foreign currency deposits have been systematically increased to discourage foreign currency borrowing. Foreign currency deposits were legally introduced in 1992 while foreign currency credit was formally permitted in 1995.

3.2 Macroeconomic developments

Following more than a decade of severe macroeconomic imbalances as a result of expansionary fiscal and monetary policies in the 1980s and the beginning of the 1990s, the Surinamese government implemented a structural adjustment program between 1992 and 1996. Through a devaluation of the grossly overvalued currency and tight monetary and fiscal policies, price and exchange rate stability was achieved in 1996. Inflation began to

accelerate in 1997, as a result of a change in public policy that entailed expansionary fiscal policies. Monetary and exchange rate policies aimed at addressing the rapidly growing macroeconomic imbalances were only partially effective (Fritz-Krockow et al, 2009).

In 2000 a new government took office and, as a result, public policy turned around. Since then, gross domestic product (GDP) has more than tripled as a result of high commodity prices and prudent financial policies. Between 2003 and 2010 average annual growth has been around 5 percent. Even in 2009, at the bottom of the international recession, the domestic economy grew by more than 3 percent, one of the highest growth rates in the region. In addition, inflation rates fell from double digits to low single digits as a result of successful stability-oriented policies and the downturn in the world economy. The Central Bank Act was extensively revised in May 2005, which strengthened the independence of the CBvS (Fritz-Krockow et al, 2009).

Table 1. Selected Macroeconomic Indicators

Indicator	1996	2000	2005	2010
GDP in million US$ (1)	861.0	946.0	1,794.0	3,682.0
GDP per capita in US$ (1)	1,947.0	2,027.0	3,598.0	6,975.0
Economic growth in % (2)	1.0	1.9	4.4	4.4
End-of-year inflation in % (2)	1.2	76.2	15.8	10.3
International reserves in million US$ (3)	177.2	14.7	162.1	685.3
Import coverage in months (3)	3.7	0.5	1.6	5.2
Coverage of money (M1) in % (3)	125.7	11.5	56.8	94.0
Fiscal balance in % GDP (4)	2.8	-9.7	-0.6	-3.1
Credit rating (S&P) (5)	n.a.	B-	B-	B+

Sources: (1) International Monetary Fund, (2) General Bureau of Statistics, (3) Central Bank of Suriname, (4) Ministry of Finance, (5) Standard and Poor's

The international reserves rose from critical levels in 2000 to comfortable levels in 2010. As a result, the import coverage improved from 0.5 months to 5.2 months. This may seem high, but a highly dollarized economy requires extra large reserves in case of a run on a dollarized bank. The coverage of narrow money (M1) increased almost nine-fold since 2000, reflecting prudent monetary policy. In the same period, the overall fiscal deficit was fairly quickly brought within the internationally accepted 3-percent-of-GDP range. In addition, the government cleared most of its external debt arrears by 2010.

The largely sound macroeconomic policies pursued in the previous decade resulted in an upgrade of Suriname's credit rating by Standard and Poor's from B minus (stable outlook) in 1999 to B positive (positive outlook) in 2009, implying a possible upgrade of the country's rating in the near future. This did indeed occur in August 2011, when the sovereign rating was changed to BB-, as a result of the repayment of an old commercial

debt to the U.S., the tightening of fiscal and monetary policies, and improved debt management in general.

In the 1990s sharp declines in the mining sector led to significant budget deficits, increased foreign debt, monetary financing and near-hyperinflation episodes. As a result, the credibility of macroeconomic policy was undermined. This has contributed to the increase of financial dollarization (IMF, 2007).

Suriname has known two episodes of triple-digit inflation during the 1990s, namely around 1994 (587%), at the height of structural adjustment, and around 1999 (113%), as a result of increased monetization of fiscal deficits. These episodes were also characterized by sharp depreciations of the currency. The average annual inflation rate of 14 percent during the 1980s rose to 83 percent during 1991-2003, whereas the official exchange rate depreciation increased from 25 percent during the 1980s to 43 percent during 1991-2003. These developments were in contrast to the trend toward greater monetary and exchange rate stability in Latin America (IMF, 2005).

Since 2004, however, the inflation performance of Suriname improved markedly, resulting on average in single digit inflation rates during 2004-2010. This increased stability, under the guidance of the newly introduced Surinamese dollar (SRD), coincided with lower dollarization ratios.

The loosening of fiscal policy due to wage increases of civil servants and increased expenditure due to the elections of May 2010, however, showed the fragilities of the Surinamese economy. Uncertainties surrounding the elections led to a growing parallel market for foreign currency. When the new government decided to honor the arrangements of a second increase of civil servant wages, the Surinamese dollar was also devalued by 20 percent in January 2011. Since then, macroeconomic conditions are largely stable.

3.3 Degree of dollarization

Suriname has experienced rapid financial dollarization since the 1990s. Financial dollarization refers to deposit dollarization (foreign currency deposits as % of total bank deposits) and/or credit dollarization (foreign currency loans as % of total bank loans). Deposit and credit dollarization are considered high when individually exceeding 40 percent (Galindo & Liederman, 2005).

The rapid increases in dollarization ratios between 1998 and 2001 can almost entirely be attributed to successive devaluations. Of course, this ‘driver’ of dollarization is merely a price effect. The increase in dollarization in this period is therefore a by-product of valuation effects from currency depreciation (Fritz-Krockow et al, 2009). Since 2002, however, volume effects kicked in as a result of institutional changes.

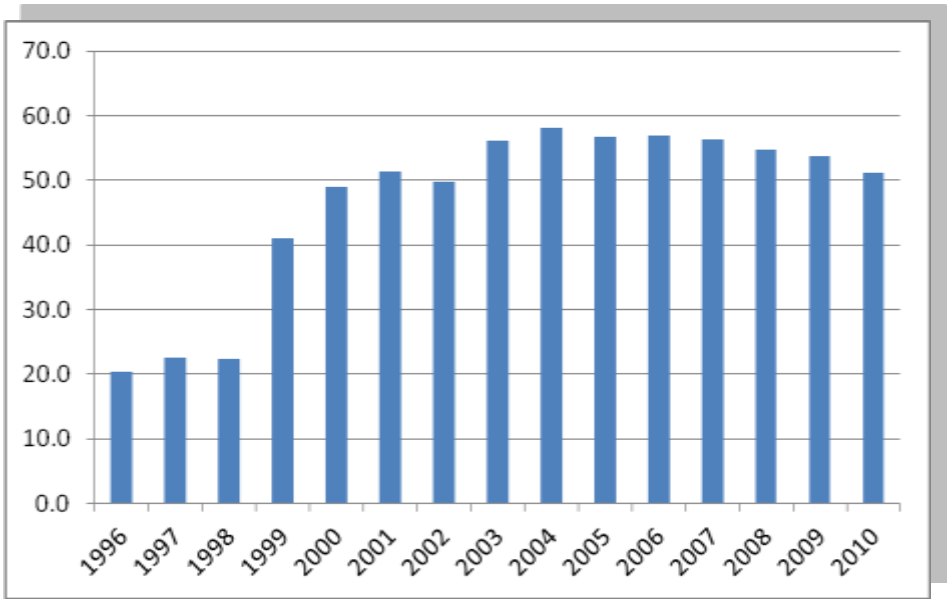
Since only few countries have succeeded in dedollarizing their economies, the high dollarization in Suriname could prove irreversible and persistent over the medium term (IMF, 2005). Although dollarized deposits were allowed since 1992, and dollarized credit since 1995, reliable data regarding these financial variables only date back to1996.

- *Deposit dollarization*

The dollarization of bank deposits rose from 20 percent in 1996 to a maximum of 58 percent in 2004. Since then this ratio has fallen to an average of 55 percent. In 2010 the degree of deposit dollarization amounted to 51 percent.

Graph 1. Deposit Dollarization

(in percent)



Source: Central Bank of Suriname

Note: Foreign currency deposits consist of USD and EUR holdings of the public.

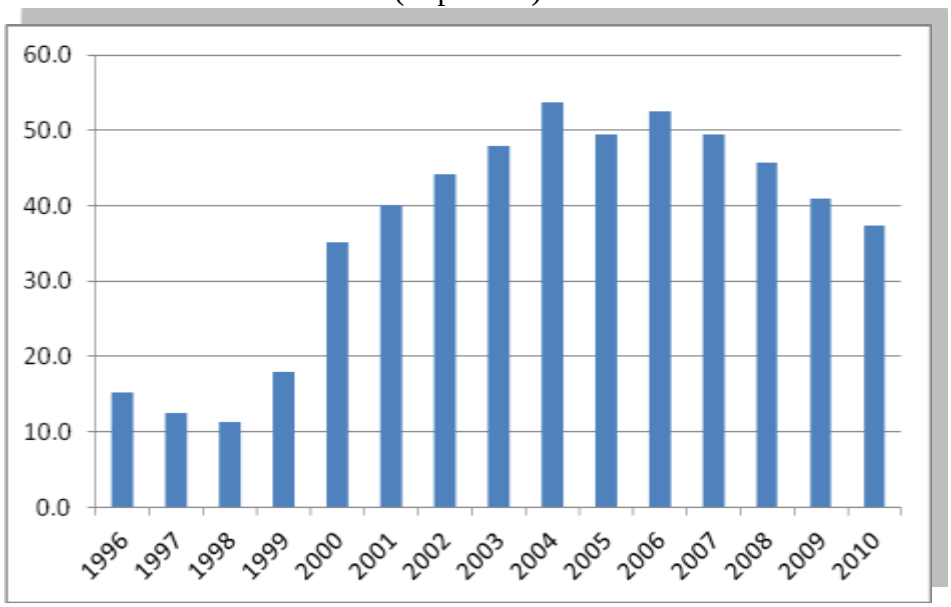
Suriname's deposit dollarization ratio in 2001 slightly exceeded the average for countries in Latin America, but with its acceleration since then, the country may have become one of the more highly dollarized economies in the region (Fritz-Krockow et al, 2009).

- *Credit dollarization*

The dollarization of bank credit rose from 15 percent in 1996 to a maximum of 54 percent in 2004. Since then this ratio has fallen to an average of 46 percent. In 2010 the degree of credit dollarization dropped to 37 percent. Even though this degree is officially below the threshold of high financial dollarization (40 percent or more), it is still very high relative to a state of dedollarization (below 20 percent).

Graph 2. Credit Dollarization

(in percent)



Source: Central Bank of Suriname

Note: Foreign currency credit consists of USD and EUR loans extended to the public.

Despite the observation that dollarization ratios have leveled off since the mid 2000s, Suriname is still subject to a high degree of financial dollarization. Incidentally, dollarization ratios showed a falling trend after the introduction of the Surinamese dollar in January 2004, possibly as a result of lowered inflationary expectations. However, even when dollarization ratios had fallen, dollarization continued to grow in local currency terms. As a result of the devaluation of the Surinamese dollar in January 2011, it is to be expected that dollarization ratios will climb again due to valuation effects.

4. Empirical model

Since this study deals with the reduction of financial dollarization, the drivers of its constituent parts, deposit dollarization and credit dollarization, are examined in this section through the estimation of two single equation models.

First, the economic models are constructed on the basis of the theoretical arguments and empirical considerations mentioned earlier. Each driver is then assigned a proxy variable or indicator. To test the econometric models, a functional form is chosen while assumptions are made about the nature of the error term. Next, the regression coefficients are estimated and the residual diagnostics are performed to verify the validity of the assumptions. Finally, the econometric results are presented.

4.1 Data and model specification

The basic data on bank deposits, bank credit, interest rates, exchange rates, imports and exports are from the CBvS. Figures on end-of-year inflation, GDP and economic growth were obtained from the General Bureau of Statistics. Deposit dollarization, credit dollarization, real interest rates, lending rate differentials and external sector scale variables based on GDP are calculated by the author. Data analysis was performed to gain an understanding of the statistical properties of the time series and to get a visual impression of existing relationships.

- *Deposit dollarization*

The potential drivers of deposit dollarization are:

- *time inconsistency of monetary policy*: Since this theory deals with the aspect of macroeconomic instability, prices as measured by the *consumer price index*, will be the indicator. Macroeconomic instability is, after all, largely associated with the absence of stable prices. The expected sign is positive;
- *institutional changes*: a) As the steep rise in deposit dollarization since the liberalization of the foreign exchange regime in 2002 has mainly been due to the repatriation of export proceeds by local gold exporters, the small-scale gold exports are a good indicator of this sub-driver. b) Since the reserve requirements on foreign currency deposits were introduced in 2003 and only annual data are available, there is an obvious short sample problem. We shall therefore refrain from testing this sub-driver. c) The third institutional sub-driver pertains to the liberalization of the local gold trade. As *small-scale gold exports* may also serve as the indicator of the latter sub-driver, they qualify as indicator of institutional change in general. The expected sign is positive;
- *small open economy [export side]*: The *export-to-GDP ratio* will be the indicator to help explain deposit dollarization due to transferred export proceeds. The expected sign is positive;
- *increased confidence in economy*: Since it is practically impossible to distinguish between ‘confidence’ inflows and ‘regular’ inflows, *economic*

growth will be the indicator of confidence in the economy. The expected sign is positive;

- *portfolio considerations*: With regard to this theory, the *real deposit rate* in local currency will be the indicator to help explain deposit dollarization. The implicit assumption here is that the public is not subject to money illusion. The expected sign is negative.

Thus, the theoretical model is: $DEPDOL = f\ (CPI, GOX, XGDP, ECG, RDR)$

$+ \quad + \quad + \quad + \quad -$

Specified as empirical model, this becomes:

$$DEPDOL = \alpha + \beta_1 * CPI + \beta_2 * GOX + \beta_3 * XGDP + \beta_4 * ECG + \beta_5 * RDR + \varepsilon$$

where:

CPI = consumer price index

GOX = small-scale gold exports

XGDP = export-to-GDP ratio

ECG = economic growth

RDR = real deposit rate

- *Credit dollarization*

The potential drivers of credit dollarization are:

- *small open economy [import side]*: The the *import-to-GDP ratio* will be the indicator to help explain credit dollarization due to extended trade credit. The expected sign is positive;
- *risk miscalculation*: The *lending rate differential* between Suriname and the U.S. will be the indicator of risk miscalculation as domestic agents are inclined to underestimate the risk of borrowing in foreign currency (Caballero & Krishnamurthy, 2003). The expected sign is positive;
- *warranties*: The *official exchange rate [selling]* will be the indicator of warranties, because of its seemingly fixed nature as a result of Suriname's de facto pegged rate. The CBvS, after all, maintains an official exchange rate as a tool to reduce fluctuations in the de jure floating rate (Fritz-Krockow et al, 2009). The expected sign is negative.

Thus, the theoretical model is: $CREDOL = f\ (MDGP, LRD, OXR)$

$+ \quad + \quad -$

Specified as empirical model, this becomes:

$$CREDOL = \alpha + \beta_1 * MGDP + \beta_2 * LRD + \beta_3 * OXR + \varepsilon$$

where:

MGDP = import-to-GDP ratio

LRD = lending rate differential

OXR = official exchange rate

4.2 Estimation procedure

Before the estimation of the specified models with Eviews 7.1, a unit root test was performed to determine whether the time series are stationary or not. Non-stationarity of variables can, after all, lead to problems like estimator bias. All time series (see Annex, Tables 1-9) were tested for stationarity using the KPSS test developed by Kwiatkowski, Phillips, Schmidt and Shin (1992). Contrary to other unit root tests, KPSS has stationarity as the null hypothesis against unit roots as the alternative hypothesis. Since all the stationary test results were positive, i.e. the data were integrated of order zero [I(0)], we continued with the estimation procedure using Ordinary Least Squares (OLS). The functional form of both equations is linear. The results of the KPSS unit root test are presented in the table below.

Table 2. Unit Root Test Results

DEPDOL Variables	KPSS	CREDOL Variables	KPSS
DEPDOL	0.447 *** **	CREDOL	0.410 *** **
CPI	0.598 ***	MGDP	0.327 *** ** *
GOX	0.528 ***	LRD	0.609 ***
XGDP	0.327 *** ** *	OXR	0.508 ***
ECG	0.349 *** **		
RDR	0.193 *** ** *		

Source: Author's calculations

Note: The 1%, 5% and 10% levels of significance are represented by ***, ** and * respectively.

The KPSS test confirms that the variables of both dollarization equations are stationary, although on different levels of significance.

4.3 Econometric results

- *Deposit dollarization*

In the estimation process of DEPDOL, the variables XGDP and ECG proved to be insignificant. The final specification therefore reads:

$$DEPDOL = \alpha + \beta_1 * CPI + \beta_2 * GOX + \beta_3 * RDR + \varepsilon$$

The regression results are as follows (t-values in parenthesis):

DEPDOL = 21.262 + 0.236*CPI – 0.051*GOX – 0.177*RDR
(8.593) (10.186) (-5.145) (-2.363)

R^2 = 0.924
D-W = 2.601

The interpretation of the coefficients is that if:

- the consumer price index increases with one point, this will result in a 0.24 percentage point increase in deposit dollarization;
- the small-scale gold exports increase with one million U.S. dollar, this will result in a 0.05 percentage point decrease in deposit dollarization;
- the real deposit rate increases with one percentage point, this will result in a 0.18 percentage point decrease in deposit dollarization.

The residual diagnostics have been performed but did not reveal signs of non-normality, heteroscedasticity or serial correlation.

- *Credit dolllarization*

In the estimation process of CREDOL, the variable MGDP proved to be insignificant. The final specification therefore reads:

$CREDOL = \alpha + \beta_1 * LRD + \beta_2 * OXR + \varepsilon$

The regression results are as follows (t-values in parenthesis):

CREDOL = 0.503*LRD + 15.996*OXR
(3.708) (22.566)
R^2 = 0.898
D-W = 1.665

The interpretation of the coefficients is that if:

- the lending rate differential increases with one point, this will result in a 0.5 percentage point increase in credit dollarization;
- the official U.S. dollar selling rate increases with one Surinamese dollar, this will result in a 16 percentage point increase in credit dollarization.

The residual diagnostics have been performed but did not reveal signs of non-normality, heteroscedasticity or serial correlation.

5. Conclusion

Suriname is a highly dollarized economy as is reflected in relatively high degrees of deposit and credit dollarization. The initial cause of dollarization can be ascribed to large increases in the *consumer price index,* causing macroeconomic instability. As expected, the econometric results suggest that the price level is not only significant but also positively correlated to deposit dollarization.

Institutional changes, such as the liberalization of the foreign exchange and gold trade regimes, have also played a role in the dollarization of the financial system. In this context, the value of *small-scale gold exports* indeed helps to explain deposit dollarization although not with the expected positive sign. The negative sign may be attributed to the fact that the regime changes did not occur until 2002 and stable monetary conditions since 2005 may have encouraged exporters to convert foreign exchange into local currency. In addition, there is evidence that export proceeds have only partially been transferred to Suriname in the period under consideration.

Trade openness is a classic driver of dollarization in small economies due to the relatively large tradable sector which needs to maintain foreign currency balances to avoid exchange risk. However, due to Suriname's history of fixed exchange rates, the country was highly open long before the dollarization of the financial system. It therefore makes good sense that both the *export-to-GDP ratio* and the *import-to-GDP ratio* have failed to explain financial dollarization in Suriname.

The indicator *economic growth* also proves to be insignificant in explaining deposit dollarization stemming from foreign direct investment and capital repatriation due to increased confidence in the economy. However, this result may have to do with the broadness of the chosen indicator.

The *real deposit rate* on local currency deposits is significant and negatively correlated to deposit dollarization, as expected. After all, if there is a positive real return on local currency instruments, investors will be less inclined to flee into foreign currency.

Of the three potential indicators to explain credit dollarization in Suriname, the *lending rate differential* and the *official exchange rate* proved to be significant with both coefficients carrying a positive sign. From the lending rate differential this was to be expected but if the exchange rate is assumed to function as a warranty, one would expect a negative correlation with credit dollarization. There is, however, evidence suggesting that the positive sign found must be attributed to currency devaluations having increased credit dollarization through valuation effects, thereby grossly overshadowing any volume effects of reduced foreign currency borrowing.

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Annex

Table 1. Deposit dollarization

Year	Forex deposits (SRD mln)	Total bank deposits (SRD mln)	Deposit dollarization (%)
1996	19.8	97.2	20.4
1997	28.3	126.0	22.5
1998	34.3	153.5	22.3
1999	104.9	256.3	40.9
2000	254.7	520.4	48.9
2001	368.0	717.2	51.3
2002	486.1	975.4	49.8
2003	697.8	1,245.4	56.0
2004	965.9	1,662.6	58.1
2005	1,037.1	1,827.1	56.8
2006	1,289.6	2,267.6	56.9
2007	1,657.1	2,944.4	56.3
2008	1,796.0	3,287.1	54.6
2009	2,199.8	4,090.4	53.8
2010	2,352.4	4,603.4	51.1

Source: Central Bank of Suriname

Table 2. Credit dollarization

Year	Forex credit (SRD mln)	Total bank credit (SRD mln)	Credit dollarization (%)
1996	8.2	53.6	15.3
1997	9.3	74.9	12.4
1998	10.4	92.2	11.3
1999	23.8	132.9	17.9
2000	50.3	143.4	35.1
2001	98.1	245.1	40.0
2002	154.8	350.5	44.2
2003	281.4	587.3	47.9
2004	415.6	774.7	53.6
2005	476.4	964.7	49.4
2006	649.8	1,237.2	52.5
2007	822.6	1,663.7	49.4
2008	1,030.6	2,256.2	45.7
2009	1,052.9	2,567.5	41.0
2010	1,119.4	2,994.0	37.4

Source: Central Bank of Suriname

Table 3. Inflation

Year	End-of-year inflation (%)
1996	1.2
1997	17.4
1998	22.9
1999	112.8
2000	76.2
2001	4.9
2002	28.4
2003	13.8
2004	8.4
2005	15.8
2006	4.7
2007	8.3
2008	9.4
2009	1.3
2010	10.3

Source: General Bureau of Statistics

Table 4. Small-scale gold exports

Year	Small miners gold exports (mln US$)
1996	0.0
1997	46.5
1998	60.6
1999	98.0
2000	33.6
2001	49.4
2002	25.6
2003	90.0
2004	159.6
2005	133.0
2006	219.2
2007	302.7
2008	427.6
2009	491.8
2010	674.0

Source: Central Bank of Suriname

Table 5. Trade openness

Year	Imports to GDP [1] (%)	Exports to GDP [2] (%)	Trade openness [1+2] (%)
1996	65.5	56.0	121.4
1997	59.8	52.7	112.5
1998	51.1	37.6	88.7
1999	54.1	47.8	101.9
2000	46.2	51.2	97.4
2001	56.0	58.9	114.8
2002	43.7	32.3	76.1
2003	49.4	42.2	91.6
2004	58.2	57.4	115.6
2005	48.0	44.0	92.0
2006	54.4	63.5	118.0
2007	58.8	64.1	122.9
2008	62.7	63.6	126.2
2009	50.4	51.5	101.9
2010	42.5	56.8	99.3

Sources: Central Bank of Suriname and General Bureau of Statistics/Author's calculations

Table 6. Economic growth

Year	Real GDP growth (%)
1996	1
1997	5.7
1998	2.3
1999	-1.4
2000	1.9
2001	4.6
2002	2.6
2003	6.3
2004	8.5
2005	4.5
2006	3.8
2007	5.1
2008	4.7
2009	3.1
2010	4.4

Source: General Bureau of Statistics

Table 7. Real deposit rates

Year	Nominal deposit rate (%)	End-of-year inflation (%)	Real deposit rate (%)
1996	16.5	1.2	15.1
1997	16.6	17.4	-0.7
1998	15.7	22.9	-5.9
1999	15.9	112.8	-45.5
2000	15.4	76.2	-34.5
2001	11.1	4.9	5.9
2002	8.4	28.4	-15.6
2003	8.5	13.8	-4.7
2004	8.1	8.4	-0.3
2005	6.7	15.8	-7.9
2006	6.6	4.7	1.8
2007	6.3	8.3	-1.8
2008	6.4	9.4	-2.7
2009	6.2	1.3	4.8
2010	6.1	10.3	-3.8

Source: Central Bank of Suriname, General Bureau of Statistics/Author's calculations

Table 8. Lending rate differential

Year	Lending rate SRD (%)	Lending rate USD (%)	Differential (% points)
1996	35.1	12.0	23.1
1997	28.9	13.6	15.3
1998	25.8	12.9	12.9
1999	28.5	12.8	15.7
2000	29.0	12.4	16.6
2001	23.5	12.0	11.5
2002	21.3	10.2	11.1
2003	21.0	9.2	11.8
2004	19.1	9.5	9.6
2005	16.3	9.7	6.6
2006	15.3	9.8	5.5
2007	12.9	9.7	3.2
2008	11.7	9.5	2.2
2009	11.6	9.5	2.1
2010	11.7	9.3	2.4

Source: Central Bank of Suriname/Author's calculations

Table 9. Official exchange rate

Year	End-of-period official selling rate (SRD per U.S. dollar)
1996	0.41
1997	0.41
1998	0.41
1999	1.00
2000	1.00
2001	2.20
2002	2.55
2003	2.65
2004	2.75
2005	2.78
2006	2.78
2007	2.78
2008	2.78
2009	2.78
2010	2.78

Source: Central Bank of Suriname