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Macroeconomic Effects of a Government Overdraft on Its Central Bank Account

by

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May 2024

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ABSTRACT

The Guyana government, from 2015 to 2021, accumulated a large overdraft on its central bank account. It owed this overdraft to a binding debt ceiling limit and fractious political environment that prevented an increase in the ceiling, allowing for the auctioning of Treasury bills to create the liquidity reflux necessary to refill the account. This paper studies the macroeconomic effects of reflux (one-sided sales of Treasury bills) and broken or incomplete reflux (base money expansion) by focusing on domestic inflation, the foreign exchange (FX) rate, and the quantity of FX traded in the local market. The empirical results suggest that the inflation rate is largely driven by foreign price and oil shocks. Nevertheless, the broken reflux adversely affected the local FX market by increasing the demand for foreign currencies, marginally depreciating the exchange rate, and slightly increasing the inflation rate. The latter finding has important implications for the enormous post-2020 budget spending since the discovery of offshore oil. However, reflux was found to have a stabilizing effect on the demand for FX and inflation. Granger predictability tests provide strong evidence that the government spends first from its central bank account before reflux occurs. Finally, the paper discusses a few novel institutional features of Guyana which resemble the monetary circuit framework (with government) of neo-chartalists.

KEY WORDS: neo-chartalism, fiscal-monetary nexus, government account overdraft, inflation, excess liquidity

JEL CLASSIFICATION: B52, E42, E51, E58, F41, H62

1. INTRODUCTION

Most macroeconomic textbooks (as well as those focusing on monetary economics and financial markets and institutions) present the stylized balance sheet of the central bank. On the asset side of the stylized balance sheet are domestic and foreign assets, while the monetary base (or high-powered money)—comprised of currencies in circulation and commercial banks' reserves—takes a prominent role on the liability side. Typically, absent from the central bank's liability is the central (or federal) government's account.[1] Obviously, the authors of the popular money and banking texts are aware of the importance of the government's central bank account, but they often assume a stable balance and a world in which deficits are only bond and tax financed, features that are often inconsistent with the institutional feature and policy practice of many developing economies (Jácome et al. 2012).

However, the government's central bank account is important in neo-chartalists' analyses of the monetary system (Wray 1998; Mosler and Forstater 1999; Bell 2000; Tcherneva 2006; Pantelopoulos and Watts 2021). This is largely because neo-chartalists advance a circuit approach—in which there is a deep connection between fiscal and monetary policies—when analyzing the monetary system (Lavoie 2013, 6). Post Keynesians, furthermore, in general, emphasize a circuit approach to study the monetary system that includes the government's account (Bougrine and Seccareccia 2002; Parguez 2002; Rochon and Rossi 2004). In stage one of the circuit, according to Lavoie (2013), the central (or federal) government borrows from the central bank, which credits its account, allowing the government to provide the initial liquidity (cash) to the banks for purchasing securities (Treasury bills and/or bonds) and to households, especially civil servants, for consumption. In the second stage, the government sells its securities (Treasury bills and/or bonds) to the private sector and mobilizes tax revenues, thus replenishing its account at the central bank (final finance). Bonds play an important role for smoothing a government's cash flow because tax revenues can be lumpy and unpredictable.

[1] One popular money and banking textbook that alludes to the government's central bank account is *Money, Banking and Financial Markets*, 4th edition (Cecchetti and Schoenholtz 2015).

In other words, when the government spends from its central bank account it produces the initial finance (efflux) to the monetary system, while when it mobilizes tax revenues and sells securities it removes liquidity (reflux) from the private sector. The efflux is important because it provides the liquidity (outside money or liquidity) needed for purchasing government securities and settling tax balances that were not yet automatically deducted from income. The liquidity reflux is important in the neo-chartalist world because it relates to a coordination between the Treasury and central bank in order to prevent the policy interest rate from moving away from its target (Tymoigne 2014). The essential idea is that when the government spends (efflux) from its account at the central bank, and there is not a corresponding reflux (contractionary open market operation), there is, ceteris paribus, an endogenous expansion of excess reserves as well as broad monetary aggregates (checking and savings accounts). The endogenous expansion of excess reserves is likely to disturb the target interest rate above the lower bound rate in the corridor operating system adopted by the Federal Reserve during the Great Recession.[2]

Moreover, the reflux principle has an open economy analogue that relates to the compensation thesis, which holds that changes in the central bank's foreign reserves automatically and endogenously lead to offsetting changes on the liability side of the central bank's balance sheet, leaving the monetary base unaffected (Lavoie 2001; Lavoie and Wang 2012). For example, when the central bank accumulates international reserves, private agents acquire excess funds and banks excess reserves. The commercial banks are assumed to automatically repay previous loans acquired from the central bank to meet the demand for loans. Non-bank private agents are also likely to repay their debt using the excess funds. Simply put, non-remunerated excess reserves should not exist in a world of endogenous reflux (sterilization) driven by private actions. The latter mechanism of automatic destruction of excess reserves clearly only partially holds in Guyana and many other developing economies: non-remunerated excess reserves persist and they are not all generated by central banks' accumulation of international reserves. Instead, the excess reserves are created by fiscal deficits that are financed by spending from the government's account at the central bank. Private agents themselves may have limited appetite

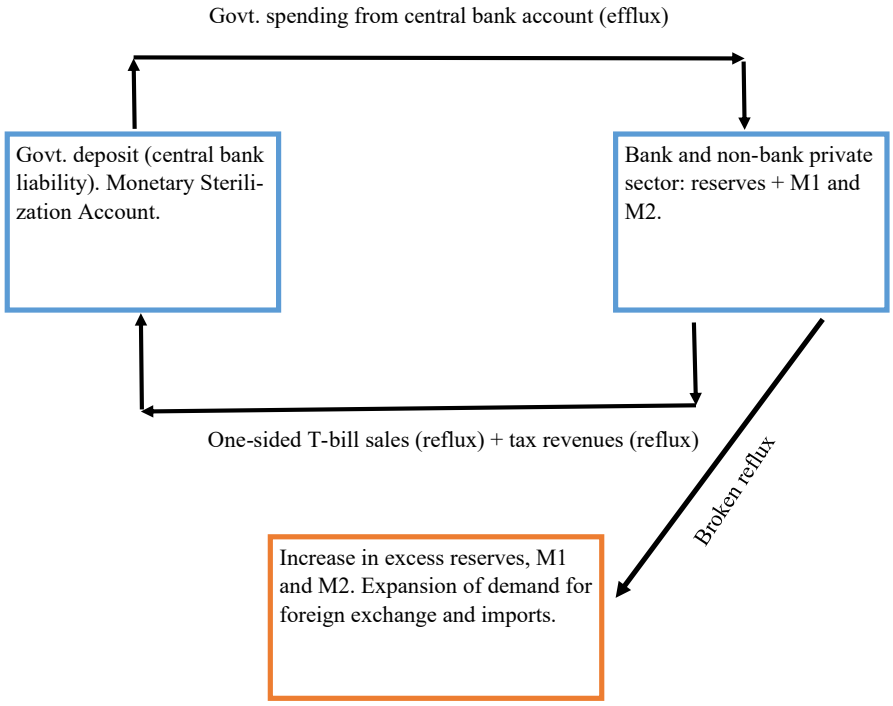
[2] The corridor operating system was introduced by the Federal Reserve as a mechanism for controlling the benchmark interest rate in the presence of large amounts of excess reserves—a feature that became prominent in the US post-2008 (Kahn 2010).

for the large supplies of Treasury bills associated with rising fiscal deficits relative to non-oil GDP (Constantine 2024). Or there is a failure of coordination between the Ministry of Finance (Treasury) and central bank when it comes to effective auctioning of government securities, evidenced by the fact that the government's money financing exceeded the annual fiscal deficit in 2015 and 2018 (Khemraj 2021, 8).

The neo-chartalist framework has been criticized on the ground that it is inconsistent with the institutional and legal restrictions under which some central banks operate (Lavoie 2013). Two such legal restrictions are a debt ceiling limit and the inability of several central banks, most notably the Federal Reserve and the European Central Bank, to purchase Treasuries in primary auctions—prompting Lavoie to declare that we live in a "post-Chartalist" world. Another criticism relates to the idea that the Treasury does not produce reserves, the Federal Reserve does or, in general, central banks do (Hogan 2021). According to Hogan, the Treasury acts as banker by making payments for the government, but that does not mean that it creates new money, which is completely the purview of the Federal Reserve. However, it is clear that the latter argument assumes that excess reserves and the broader monetary base are completely exogenous.

This paper presents the Guyanese case study. It has three objectives: (i) to document the legal and institutional framework governing the fiscal–monetary interaction that neo-chartalist authors have discussed for years; (ii) to assess the empirical effects of incomplete or broken reflux (expansion of the monetary base) and one-sided sales of Treasury bills (reflux); and (iii) to empirically assess the neo-chartalist argument that government first spends from its central bank account and sells bonds afterward. For the remainder of paper, the terms one-sided sale or one-sided reflux are used to emphasize that the central bank never conducts expansionary open market operations by purchasing Treasury bills in the secondary market. Figure 1 below illustrates the key elements of the monetary circuit for the purpose of this paper.

Figure 1. Monetary Circuit: Reflux, Efflux and Broken Reflux



It should be noted that the causal role of base money expansion is a cornerstone of monetarism, which has largely been integrated into modern mainstream macroeconomics (De Long 2000). Fundamental to monetarism is the idea that uncontrolled expansion of the monetary base will engender higher inflation and exchange rate depreciation (Bilson 1978). At the practitioners' level, monetarism shows up as fiscal dominance—the disruption of independent monetary policy by fiscal policy (Cottarelli 1993). However, it should be noted that a key policy proposal of monetarism—that the money supply could be the monetary policy instrument—has not been adopted by the mainstream monetary macroeconomics, preferring instead the benchmark interest rate as the policy instrument.

However, I insist that it is fruitful to analyze the Guyanese case through a neo-chartalist lens for a few reasons. Firstly, the government's central bank overdraft is central to the Guyanese case study. Impelled by a debt ceiling limit, the Guyanese government accumulated six years of overdraft at the Bank of Guyana (Guyana's central bank) from 2015 to mid-2021 (Khemraj 2019, 2021). As noted earlier, this account is fundamental to the neo-chartalist framework because they are not only concerned with efflux, but also reflux—or the smooth functioning of

the monetary circuit. Monetarism underscores base money expansion and its harmful consequences, but ignores the monetary circuit approach that also calls for balancing efflux and reflux.

Secondly, studying the institutional context of economic phenomena (external consistency) is a methodological approach central to neo-chartalist and Post Keynesian analyses, broadly defined.[3] The central government does not directly sell its Treasury bills to the Bank of Guyana (BOG). Nevertheless, the neo-chartalist world still holds because the BOG auctions Treasury bills on behalf of the government—in the process generating continual one-sided reflux when it drains excess reserves from the banking system that was fully privatized (Ganga 2000; Khemraj 2007). Moreover, the one-sided sale of Treasury bills on behalf of the government yields two effects on the BOG's balance sheet. Firstly, a fraction of excess reserves was sterilized in the Monetary Sterilization Account, meaning that the funds are not available for future government spending. However, and secondly, a larger and growing share of the funds are deposited in the government's account at the BOG, allowing for future payments, as noted by the Auditor General's report (AOG 2019).[4]

Thirdly, by emphasizing the importance of reflux, we are able to explore the possibility that one-sided sales of Treasury bills unwittingly perform as monetary policy instruments for stabilizing the local FX market in developing economies—a proposition absent in monetarism and neo-chartalism. In particular, we want to observe whether selling Treasury bills (a quantity instrument as opposed to a price instrument) has a stabilizing effect on the exchange rate, inflation rate and demand for FX. The mechanism of central bank auctions (one-sided sales) of Treasuries resembles the one-sided sale of central bank bills, which were found to exert a stabilizing effect in the local FX market in Papua New Guinea (Direye and Khemraj 2022). This is because the private agents are not necessarily trying to get rid of the excess reserves to repay debt as in Lavoie (2001), but to use the latter to purchase foreign currency assets. Hence, the

[3] See Simon Wren-Lewis (2016) for an excellent discussion of the importance of external consistency versus micro-foundation.

[4] The Auditor General's report (2019) notes that most of the funds are deposited in the Consolidated Fund, which is linked to the government's central bank account.

one-sided Treasury bills replace the non-remunerated excess reserves produced from fiscal deficits with a domestic interest-earning security.

Finally, an attempt by the government to settle its negative balance with the central bank proved ineffective, not resulting in the necessary reflux—thus, contravening the monetary circuit and the neo-chartalists' insistence that Treasury and central bank operations have to be coordinated to defend the monetary policy instrument. In mid-2021, instead of relying on continual, one-sided sales of Treasury bills, the government sold debentures to the BOG, which, in turn, held them as assets while crediting the government's account. The latter is merely an "intra-governmental" transaction without the necessary draining of liquidity from the private sector—thus resulting in a pure monetization of the deficit as was the case when the government ran an overdraft without the corresponding reflux.

This paper has the following sections. Firstly, Section 2 presents the institutional background. Section 3 presents an empirical analysis to study the effects of efflux and reflux as well as their temporal ordering using predictability tests. Section 4 concludes.

2. INSTITUTIONAL CONTEXT

The Bank of Guyana Act of 1998 spells out the legal framework under which the central bank operates. The act makes it clear that the BOG cannot expand credit to the government through the purchase of securities (BOG 1998). For instance, Section 47 says: "Except as provided in Sections 7(3), 45, 49(2) and 50, the Bank shall not extend credit directly or indirectly to the government or any public entity." Contrastingly, and interestingly, Section 45 (e) of the Act specifies that the central bank can sell Treasury bills for the government; therefore, not only enshrining coordination between Treasury and central bank, but also positioning the operating framework in the realm of neo-chartalism.

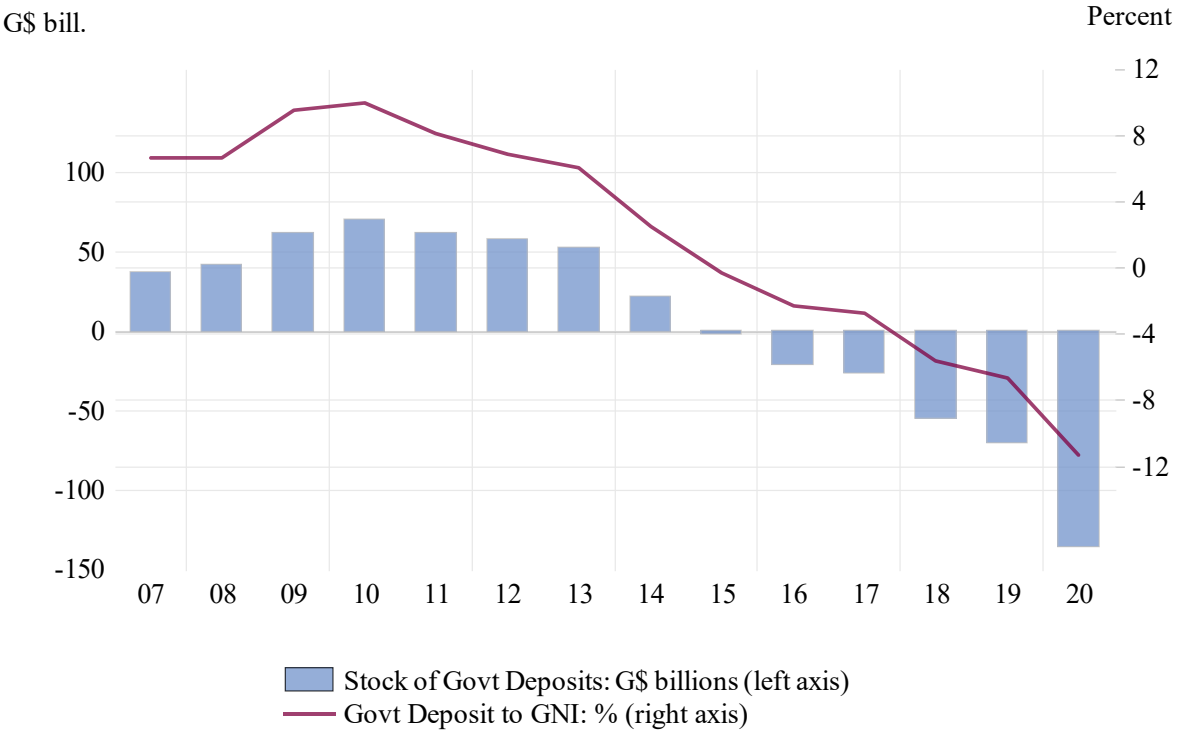
Exceptions are made for the transfer of the central bank's operating surplus to the government's Consolidated Fund (an account that is linked to the government's central bank account), one-

time debentures and negotiable certificates—the latter being a very small amount. Interestingly, 45 (c) explicitly allows the BOG to service the interest payment on the public domestic debt. The implication of 45 (c) is that interest payments by the BOG are initially efflux.

The proceeds from Treasury bill sales were intended to be placed in the Monetary Sterilization Account (MSA), which is on the liability side of the central bank's balance sheet. However, by the end of 2018, 68.4 percent of Treasury bills were sold for fiscal purposes—meaning they were deposited into the government's account to facilitate future payments (MOF 2018). This number jumped to over 99 percent for 2019 fiscal operations (MOF 2020).

The proceeds from Treasury bill sales would eventually diminish as the domestic public debt reached its ceiling of G$150 billion—a limit that was last adjusted in 1994 before the most recent increase to G$500 billion in 2021 (MOF 2021a). As early as 2010, the government's balance peaked at G$70 billion (9.9 percent of GNI), subsequently decreasing and turning negative in 2015 (see Figure 2). As the debt ceiling binds, the government turned to explicit central bank financing, accumulating a negative balance that amounted to G$135 billion in 2020 (12.2 percent of GNI). These numbers appear to exceed the average of central bank financing in sub-Saharan Africa (Hooley et al. 2021).

Figure 2: Government Account Balance and Its Share of Gross National Income (GNI)

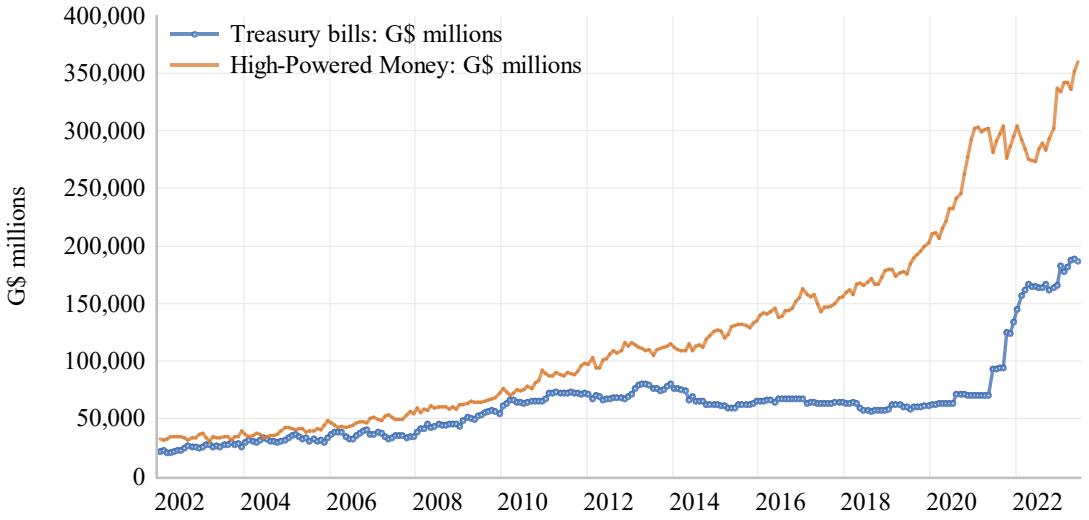


Data source: Bank of Guyana Statistical Bulletins (various years)

The contentious political environment likely prevented the increase in the debt ceiling in 2011. Peoples Progressive Party–Civic (PPP-C) lost its majority in the 2011 general election but still won the presidency. The parliamentary minority status of the government made it difficult to increase the debt ceiling; and with eyes locked on the 2015 general election, the government cranked up spending by turning to financing from the BOG. This can be seen by the continual decline in the balance starting in 2011 until the positive balance was restored in 2021. Indeed, according to data from the Bank of Guyana, the fiscal deficit increased from G$16.4 billion (−2.1 percent of GNI) in 2011 to G$34.9 billion (−4.1 percent of GNI) by the end of 2014, a few months before the May 2015 general election. The new Partnership for National Unity + Alliance for Change (APNU+AFC) government of 2015 also failed to raise the debt ceiling, possibly because of the fierce opposition from the PPP-C and the vote of no confidence, which the government lost, in December 2018.

Figure 3 indicates that there was a tight relationship between the stock of Treasury bills held by the commercial banks and the monetary base (high-powered money) until the end of 2011. The level of Treasury bills remained almost flat between 2011 and 2013, while the stock of high-powered money (MB) continued to expand. The stock of Treasury bills declined from G$80.5 billion in 2013 to G$70.3 billion in May 2021. Meanwhile, MB expanded from G$88 billion in 2011 to G$303 billion by March 2021, indicating two factors. First, there is a breakdown of the Treasury and central bank coordination previously signalled by the tight relationship between MB and Treasury bills. Secondly, there is incomplete reflux evidenced by the decline in Treasury bills and accumulation of MB.

Figure 3: Incomplete Reflux and High-Powered Money



Data Source: International Financial Statistics and Bank of Guyana

The debt ceiling was raised in June 2021, allowing for new auctions of Treasury bills which caused a steep increase in stock held by the commercial banks. In addition, the Ministry of Finance securitized the overdraft by using one-time debentures of various maturities (MOF 2021b; BOG 2023, 3–4). The government's domestic debt strategy of 2021 outlines the need for auctioning Treasury bills and bonds of various maturities in order to prevent future overdrafts. Moreover, Treasury bills will continue to be auctioned for partial financing of the deficit and "debt contracted by the Bank of Guyana in the execution of monetary policy shall constitute a part of Guyana's total public debt. The Bank of Guyana and the Ministry of Finance shall have a

shared understanding of the objectives of debt management, fiscal and monetary policies, and work together to ensure policy consistency and coherence. Furthermore, government intends to cease the use of the overdraft at the Bank of Guyana to finance the budget, instead relying on market-based securities to help meet borrowing requirements" (MOF 2021b, 5).

Meanwhile, Figure 3 indicates that as the Treasury bills held by banks rose from G$70.3 billion in March 2021 to G$164 billion in June 2022, and the MB declined over the same period—indicating the restoration of monetary reflux. However, there is a substantial increase in MB from G$273 billion in June 2022 to G$359 billion in June 2023, while the increase in the stock of Treasury bills was much smaller for the same period (G$164 billion to G$186 billion) suggesting partial reflux and a breakdown of the management of the coordination necessary to maintain the tight relationship between reflux and efflux.

Moreover, the one-time sale of debentures to the BOG does not produce the required reflux, but instead merely credits cash to the government's account and creates a corresponding asset of the central bank. Debentures indicate an asset-side operation by the central bank, unlike the one-sided sale of Treasury bills (or central bank bills) which represent a liability-side operation. The debenture operation is closer to the spirit of monetization of the deficit. It is inconsistent with the coordination and skilled public management inherent in the monetary circuit approach of neo-chartalism.

Furthermore, the steep increase in the MB after the debentures were sold indicates that the government has started to spend down the positive balance without the corresponding reflux associated with Treasury bills. Indeed, the overdraft amounted to G$147.5 billion in May 2021. Since the sale of debentures, the account moved to a positive balance of G$68.5 billion in June of the same year. As at the end of November 2023, the government's account now stands at G$9.6 billion.

3. EMPIRICAL ANALYSIS

This section explores the dynamic relationships among the key macroeconomic variables, with special emphasis on the effects of one-sided Treasury bill sales (reflux) versus the accumulation of high-powered money (efflux). Therefore, we are particularly interested in understanding how innovations in one-sided Treasury bill (TB) sales and high-powered money (MB) influence the FX market and inflation. We do not have granular real-sector data such as unemployment and GDP; therefore, the analysis is partial with an emphasis on inflation and FX–market adjustments. A monthly dataset from 2000 (January) to 2023 (September) is used to make all estimations. As expected, the FX market has two variables: the price (G$/USD exchange rate) and quantity (the monthly sales of foreign currencies in the Guyanese FX market). It should be noted that monthly FX sales are tied to imports and other uses of foreign currency. Therefore, an increase in FX sales signals greater demand for foreign currency (greater market pressure), while a decrease in FX sales suggests a fall in demand (less market pressure)—assuming everything else is constant.

As a small and very open economy, Guyana is a price taker and faces many international shocks. Therefore, the analysis includes two exogenous variables: oil price (monthly Brent crude price: USD) and an index of foreign inflation (foreign price). The latter is calculated as the weighted average of inflation in the US, China, Singapore, Trinidad and Tobago, and Japan given that these countries represent the largest source of Guyanese imports. The weights were calculated using the annual level of imports from said countries (in USD).

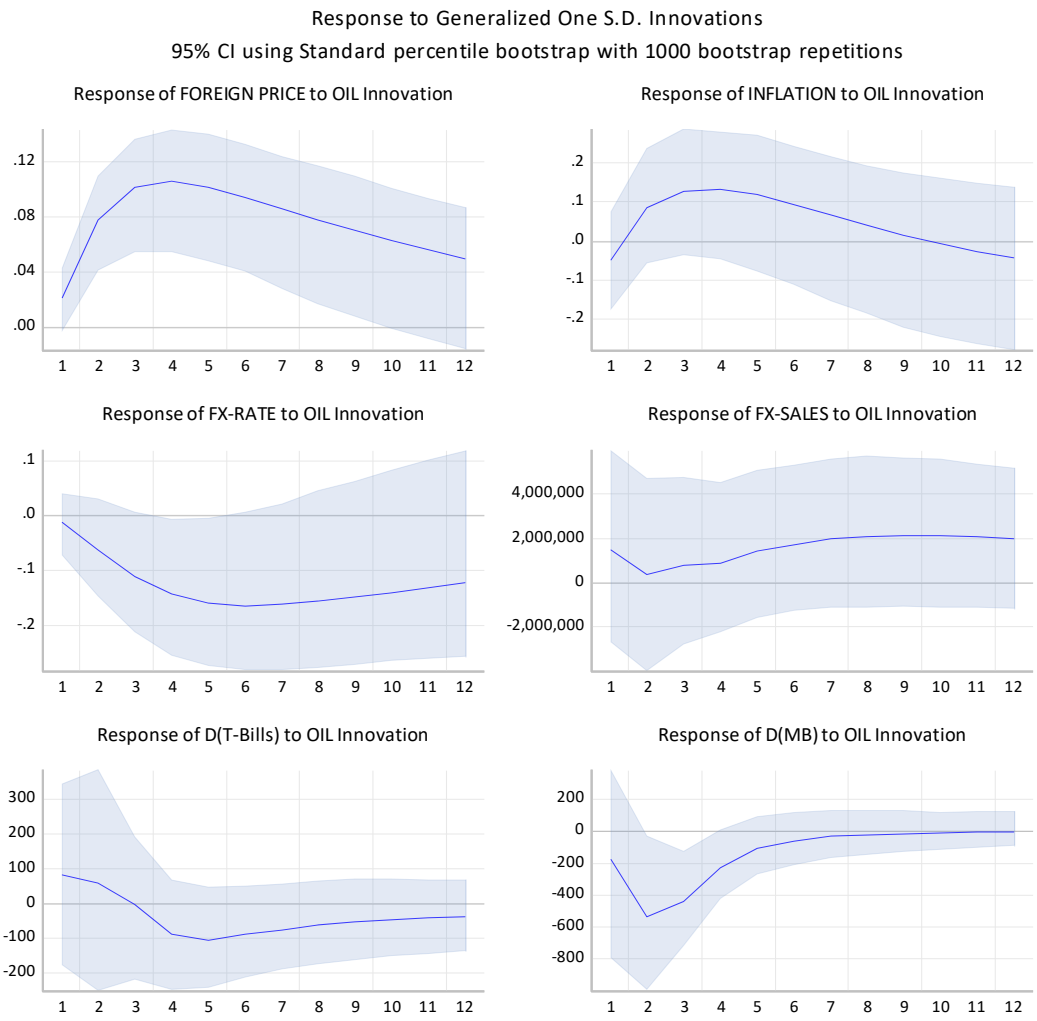
Therefore, the analysis includes the following variables: inflation rate, G$/USD exchange rate, FX sales (USD), first-difference of MB, first-difference of TB, oil price (USD) and foreign price (FP). FX sales represent a flow variable and the first-difference in the two stock variables produces flow variables. There are three flow variables (quantities) and three price variables. It is obvious that these variables are endogenous to each other over certain lags. A VAR methodology is particularly useful for studying the impact response and dynamic adjustment of endogenous variables given an exogenous shock to the system. The shocks we are interested in studying are an oil shock (or innovation), a foreign price shock (or innovation), a reflux shock (or innovation) and an efflux shock (or innovation). Although FP and oil price are exogenous variables, they are

still included in the VAR—instead of being treated as purely exogenous as in a VARX—because local expectations are formed on these foreign prices, resulting in feedback effects.

The usual conventions associated with estimating VARs are followed. All the roots of the characteristic polynomial fall within the unit circle. The final model has two lags in order to satisfy the Akaike information criterion (AIC), Schwarz information criterion (SIC), and no autocorrelation. A "realist" VAR is estimated, implying that no theoretical presumption is made in terms of the ordering of the variables when identifying the impulse response functions (IRFs). Therefore, all the reported IRFs are identified using the approach of generalized IRFs (Pesaran and Shin 1998).

Figure 4 presents the results of the impact response and dynamic adjustment of each variable, given a shock to oil price. The oil shock increases the foreign price, which is the weighted average of US and Chinese inflation (left, top row). There is both a positive response and positive dynamic adjustment over the forecast horizon, results which corroborate previous findings regarding oil price and inflation in the US and China (Khemraj and Yu 2023; Chen, Zhu, and Li 2020). As it relates to Guyanese inflation (right, top row), the oil shock has a small negative response that quickly turns to a positive dynamic adjustment in period 2. The adjustment remains positive until it turns negative in period 10. At its peak, the oil shock has a higher passthrough on Guyanese inflation, but the effect is mixed as evidenced by the unexpected negative impact effect and adjustment from period 10. Government policy likely explains the mixed effect. The state-owned company, GUYOIL, often reduces the passthrough from higher imported oil prices, causing the private gas stations to follow.

Figure 4: The Effects of an Oil Price Shock



FX sales respond positively to the higher oil price (right, middle row). The adjustment is also positive over the forecast period, indicating that FX demand increases unambiguously following an oil shock. This is not surprising because Guyana is unable to substitute away from oil in times of high oil prices. Interestingly, the exchange rate appreciates even though the demand for foreign currency rises (left, middle row). This likely indicates the managed exchange rate at work, the wide error bands notwithstanding.

Finally, higher oil prices are associated with increased commercial bank demand for Treasury bills up to three months in the forecast, after which point the demand decreases. The latter is

consistent with the decrease in high-powered money (MB) which returns to zero in period 10 (bottom row). However, the positive increase in demand for Treasury bills is not as large as the decrease in the MB, implying that higher oil prices result in a certain level of sterilization of money as the private sector purchases oil from the government-owned GUYOIL.

Figure 5 presents the impact effects and dynamic adjustments of the foreign price (FP) shock. Although oil price rises, it is obvious the response is not as strong as the opposite effect: the oil shock on foreign price. Guyanese inflation increases following an FP shock, a result which is not particularly surprising given that Gampat (1995) uncovered a similar finding using a multiple regression approach with stringent correction for autocorrelation. The impact effect is positive and the adjustment is also positive throughout the forecast horizon. The chart indicates that the foreign price has a stronger overall effect on Guyanese inflation relative to the oil shock (top row, right).

As the FP rises, FX sales decreases until period 4 and rises after (row 2, right). The initial decrease in FX sales suggests that there is initial substitution away and/or a reduction in the demand for foreign goods and services following an FP shock. As noted earlier, this is not the case with an oil shock. Similar to the previous result, the exchange rate appreciates, possibly suggesting the management of the rate by the BOG when there is an international shock.

Figure 5: The Effects of a Foreign Price Shock

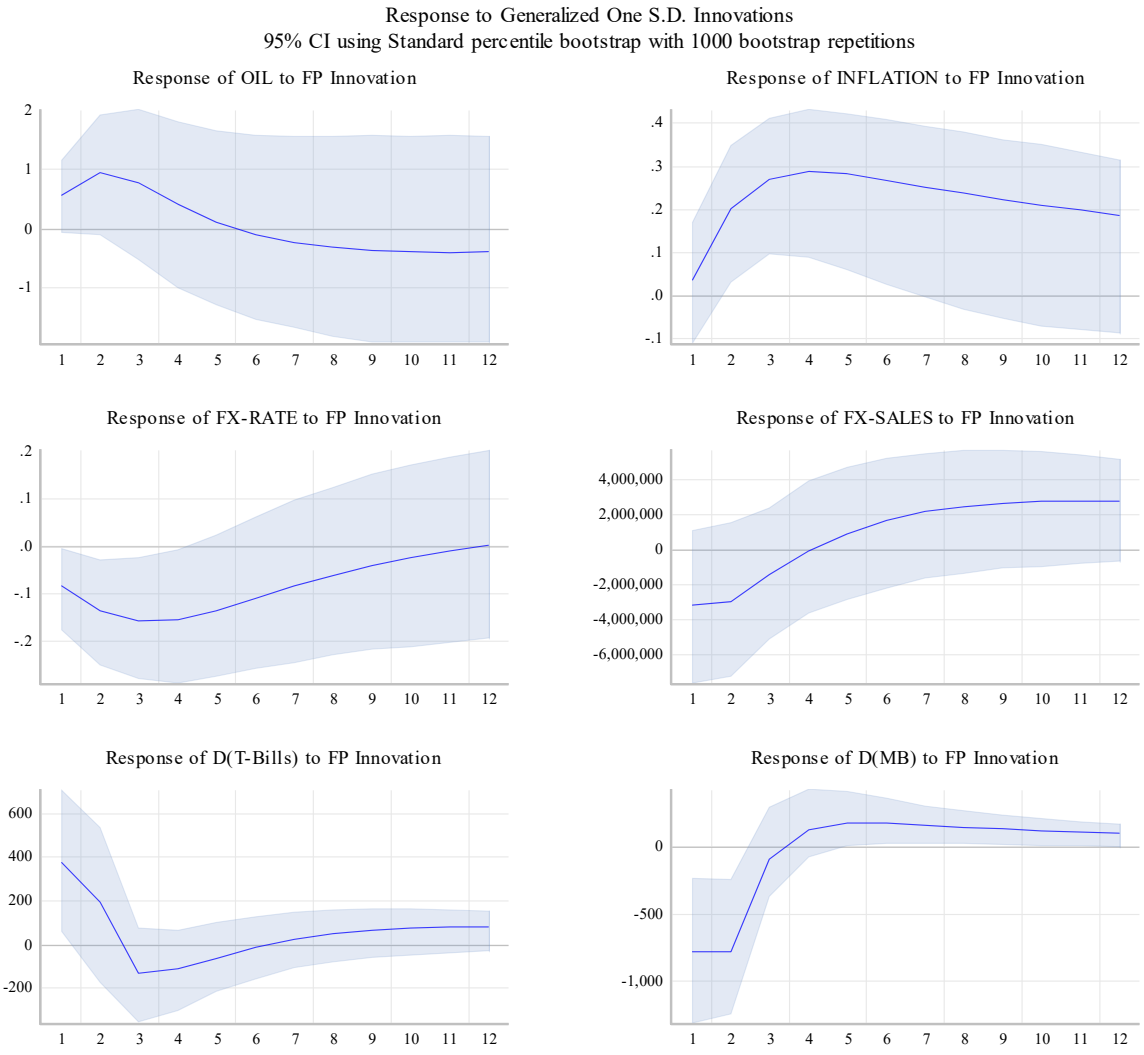


Figure 6 indicates the results from increasing MB (pure efflux). The expected inflationary effect is small and the error bands are wide. Both oil and FP shocks have substantially stronger effects on Guyanese inflation, indicating that this variable is largely externally driven. The exchange rate slightly appreciates but mainly depreciates over the forecast horizon following an MB shock. The strongest effect of efflux is the unambiguously large increase in FX sales, both the impact response and dynamic adjustment are significant. The implication is that if efflux is left unchecked, the demand for foreign currency will increase, thus tightening the foreign currency constraint. The increase in efflux is associated with a fall in commercial banks' holdings of Treasury bills. However, the adjustment is very short-lived, turning positive in period 2 and becoming zero by period 9.

Figure 6: The Effects of Expanding High-Powered Money (Pure Efflux)

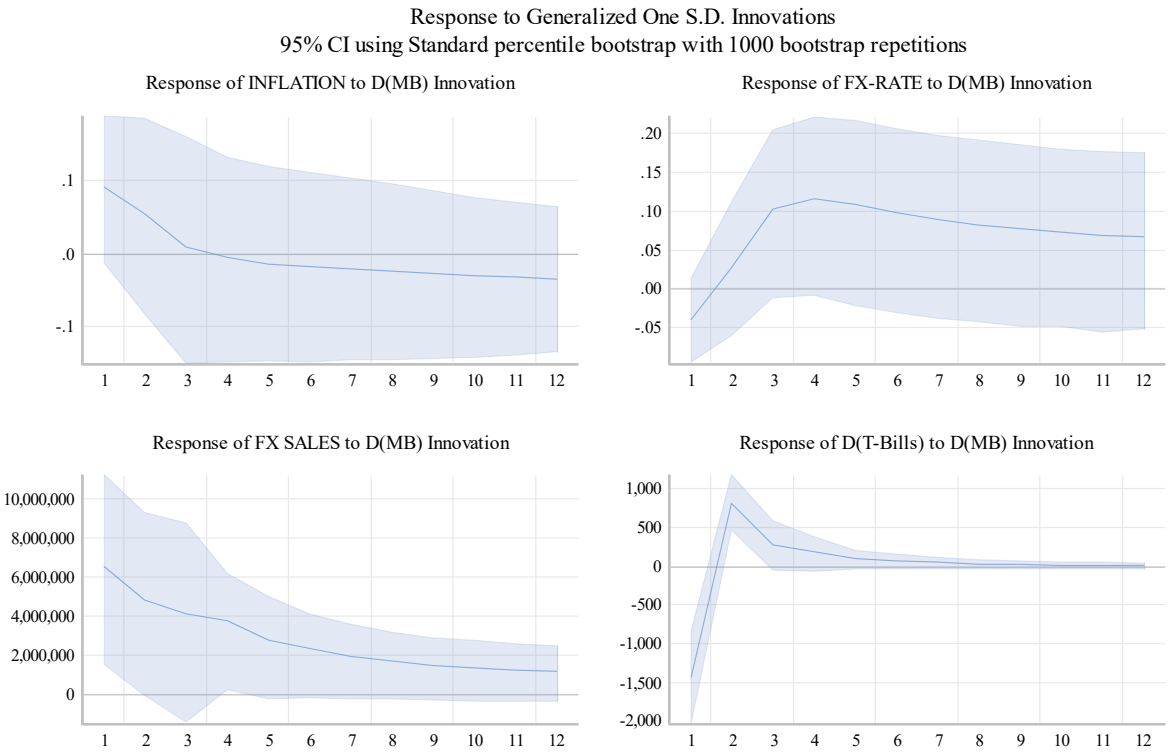
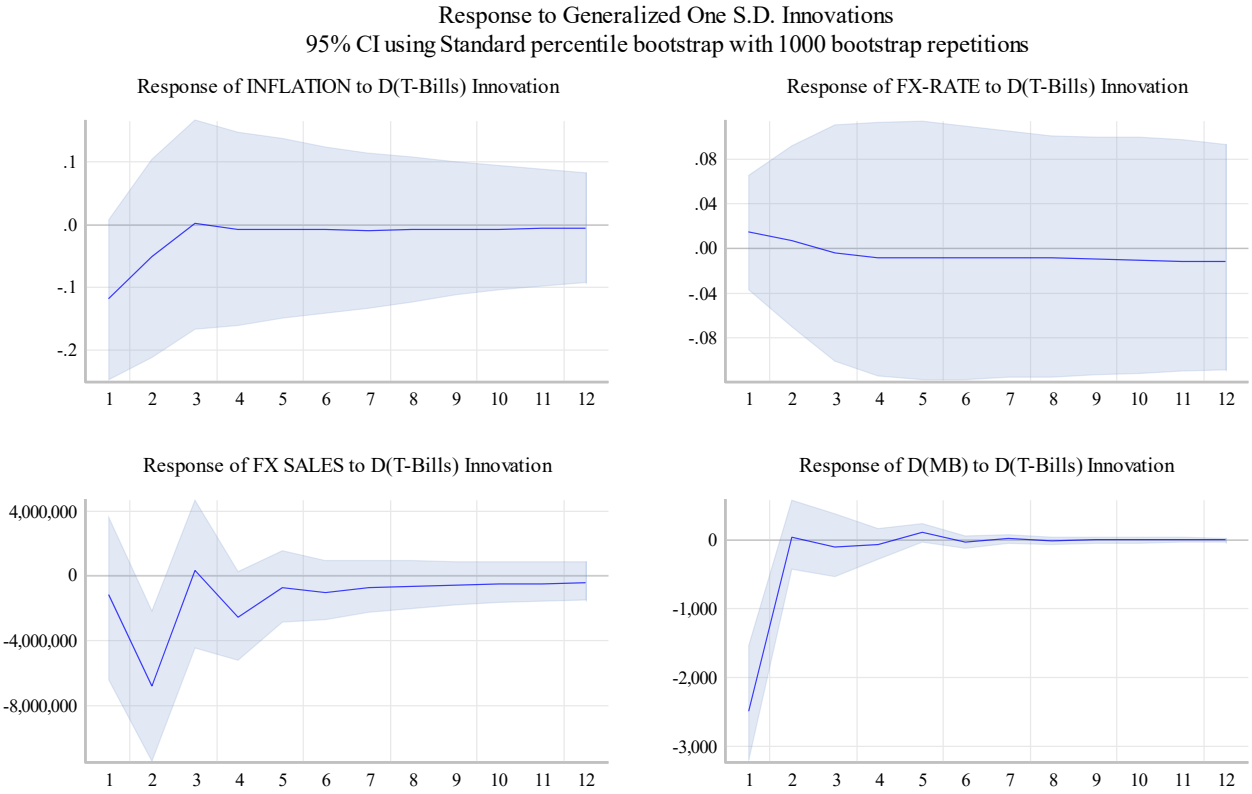


Figure 7 indicates the effects of one-sided sales of Treasury bills. It is clear that expanding the domestic debt has a negligible positive response in the exchange rate—a depreciation. However, from period 3 the rate falls to an appreciation. The wide error bands suggest that selling domestic papers does not have a strong statistical effect on the exchange rate. However, one-sided sales have the effect of slightly reducing inflation, the adjustment of which converges to zero from period 3. Interestingly, the one-sided sales decrease FX sales—our proxy for FX demand—thus easing a foreign exchange pressure, a result similar to the finding for Papua New Guinea (Direye and Khemraj 2022). Finally, it is clear that Treasury bills are effective in neutralizing high-powered money (bottom row, right).

Figure 7: The Effects of One-Sided Treasury Bill Sales (Reflux)



One might argue that the debt limit and the accompanying overdraft indicate that efflux comes before reflux. However, the latter is only evident during the period of overdraft and a binding debt ceiling. We want to test the entire sample to determine whether the government spends from its own account first and refills the account later. Recall that a core proposition of neo-chartalism is the notion that efflux occurs before reflux. In other words, the government first writes checks from its central bank account and then sells securities in order to refill the account. If this is the case, then government deposit must Granger predict (cause) Treasury bills.

Table 1 presents the Granger predictability (causality) test results for government deposit and Treasury bills. As a matter of robustness, the test is done for two, three, four, and five lags. At all lags, the test fails to reject the null hypothesis that Treasury bills do not cause government deposits. However, the test significantly rejects the null hypothesis that government deposits do

not cause Treasury bills. It is clear, therefore, that the results are consistent with a neo-chartalist world.

Table 1: Granger Predictability Test—Government Deposit and One-Sided Treasury Bill Sales

Lags: 2			
Null Hypothesis:	Obs	F-Statistic	P-Value
D(Govt Deposit) does not Granger Cause D(T-Bills)	282	3.64	0.028
D(T-Bills) does not Granger Cause D(Govt Deposit)		0.23	0.795
Lags: 3			
Null Hypothesis:	Obs	F-Statistic	Prob.
D(Govt Deposit) does not Granger Cause D(T-Bills)	281	3.90	0.009
D(T-Bills) does not Granger Cause D(Govt Deposit)		0.15	0.928
Lags: 4			
Null Hypothesis:	Obs	F-Statistic	Prob.
D(Govt Deposit) does not Granger Cause D(T-Bills)	280	24.76	0.000
D(T-Bills) does not Granger Cause D(Govt Deposit)		0.17	0.952
Lags: 6			
Null Hypothesis:	Obs	F-Statistic	Prob.
D(Govt Deposit) does not Granger Cause D(T-Bills)	278	17.03	0.000
D(T-Bills) does not Granger Cause D(Govt Deposit)		0.42	0.8645

Source: author's calculation

4. CONCLUSION

By studying the Guyana government's six-year negative balance accumulation on its central bank account, this case study uncovers several interesting institutional arrangements relating to the nexus between Treasury and central bank operations. Firstly, the negative balances were hastened by a binding debt-ceiling limit and the political environment. Secondly, government does not sell its Treasury bills directly to the central bank; instead, the central bank auctions Treasury bills on behalf of the Treasury (Ministry of Finance), resulting in a liability-side arrangement similar to central bank bills. We note that the latter institutional feature places Guyana's fiscal-monetary operations in a neo-chartalist world.

There is clearly a breakdown of the neo-chartalist monetary circuit in Guyana, owing to the debt ceiling limit, antagonistic politics, enormous fiscal deficits relative to the non-oil sector, and the failure of Treasury–central bank coordination. It should be noted, furthermore, that the central bank does not hold the Treasury bills as assets—hence, we have a liability-side coordination operation in which the funds from the Treasury bill sales are deposited into the government's account for future spending. The original design was to have the funds sterilized in the Monetary Sterilization Account, also on the liability-side of the central bank's balance sheet.

Thirdly, after six years, the government conducted a one-time sale of debentures to the central bank in order to erase the negative account balance. We called this transaction an asset-side one because the BOG holds the debentures as assets and credits the government's account, allowing for classic monetization of the deficit, unlike the one-sided sale of Treasury papers consistent with Treasury–central bank coordination. The coordination of Treasury and central bank activities is also consistent with the logic of the monetary circuit, unlike selling debentures to the central bank. The latter is a purely intra-governmental transaction that monetizes the deficit and should not be confused for the neo-chartalists' Treasury-central bank coordination for the purpose of defending the monetary policy instrument.

An econometric analysis reveals that continual reflux, characterized by one-sided auctioning of Treasury bills, helps to stabilize the foreign exchange rate and quantity as well as inflation. The latter result likely occurs because the interest-earning Treasury bills replace the previously injected non-remunerated excess reserves associated with deficit monetization and overdraft. In other words, reflux replaces high-powered money, which the empirical estimates indicate depreciates the exchange rate and increases inflation. Nevertheless, external price and oil price seem to have more consistent and larger effects on inflation, assuming the inflation data supplied by the government are accurate.

As a policy recommendation, the Bank of Guyana should move to create its own securities such as central bank bills that only serve a sterilization purpose of mopping up excess reserves. The market interest rate on central bank bills could evolve into the benchmark policy rate of the central bank. The Treasury or Ministry of Finance should be responsible for auctioning its own

securities—Treasury bills and bonds—with various maturities. The latter, however, will still face the challenge of limited financial absorptive capacity given the rapid post-2020 expansion of the deficit which is tied to GDP instead of non-oil GDP—or some reasonable weighting of the two. The various interest rates could provide a yield curve to signal future economic states of the world.

Continual reflux and interest rate signaling are two important mechanisms diminished by running a long-term overdraft and settling the balance with debentures. These actions amount to deficit monetization that often produce undesirable effects, especially quantity adjustments in the local foreign exchange market.

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