# Political Pressure and Central Bank Monetization: "Dutch Disease" and Monetary Developments in Ghana & Guyana

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# Political Pressure and Central Bank Monetization:

## "Dutch Disease" and Monetary Developments in Ghana & Guyana

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### Abstract

This article highlights the role of political pressure and oil discoveries in influencing central bank financing of fiscal deficits—monetization—in Ghana and Guyana. Ghana's monetization was relatively low from 2000 to 2007 but surged after the 2007 oil discovery and subsequent electoral promises. Similarly, central bank monetization increased in Guyana following a minority government in 2011 and oil discovery in 2015. To explain these facts, the traditional Dutch disease model must be extended to include a monetary sector. Our model makes two predictions that are borne out by the data. In Ghana, monetization leads to nominal exchange rate depreciation, causing a real depreciation—not a real appreciation as predicted by the canonical Dutch-disease model. In Guyana, monetization results in real exchange rate appreciation because of its managed exchange rate regime, which also creates foreign exchange shortages. Effective management of resource wealth requires political moderation to maintain central bank discipline.

**Keywords**: Ghana, Guyana, real exchange rate, Dutch disease, central bank monetization
**JEL Classification**: E31, E51, E58, E65, F31, F32, O57

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*[. . . ] suppose aid is used to buy traded goods that would not otherwise have been purchased (owing, presumably, to a dearth of foreign currency). In this case the real resource transfer intended by the provision of aid is effected immediately, the available supply of traded goods is increased, and this should enhance consumption in the recipient country and production to the extent that the imported goods are complementary to domestic goods in the production process. There is no inflationary effect or loss of competitiveness.*

Isard et al. (2006: 9)

# 1   Introduction

Does the expenditure of natural resource rents (oil funds) appreciate the real exchange rate? Based on the epigraph the answer is *no*. This paper demonstrates that central bank financing of government spending (monetization) often increases after the discovery of oil, thereby influencing the evolution of the real exchange rate. Other researchers also observe episodes of monetization when there is a sudden surge in foreign aid (Hussain et al. 2009; Roemer 1989). We document enhanced monetization after the discovery of oil by carefully analyzing the time-series facts of a frontier oil producer, Guyana, and a somewhat more mature oil producer, Ghana. We also show that oil discoveries increase unsound political promises and commitments, which lead to pressure for finding a rapid source of financing of government spending—namely, central bank financing of non-tradable expenses such as the wage bill of a growing civil service.

Therefore, does central bank monetization or the expenditure of resource rents cause the appreciation of the real exchange rate? The idea that newfound revenues (natural resource rents) overshoot (appreciate) the real exchange rate is known as the Dutch disease.[1] There is a voluminous literature—too numerous to cite here—on the Dutch disease.[2] For our purposes, the canonical Dutch-disease models are real-sector models (Corden 1984; Corden and Neary 1982). The models include a booming natural resource sector (oil and gas), a manufacturing sector (tradable), and a services sector (non-tradable). The price of manufacturing (an index) and oil price are determined

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[1]Rents are the actual return of a factor of production relative to what would have prevailed under a perfectly competitive industry. In our context, oil rents are made when the oil company sells oil at a price in excess of the marginal or average cost to produce a barrel. In many developing countries, governments receive a percentage of the gross rents as royalty, corporate profit and/or profit share.

[2]Useful discussion of the main literature of the Dutch disease with respect to oil rents, foreign aid and remittances include: Rajan and Subramanian (2011), Addison and Baliamoure-Lutz (2017), Alssadek and Benhin (2021), Cust et al. (2022), and Anwar and Mang (2022). Ross (1999) discusses the Dutch disease and the general resource curse from a political science perspective.

internationally, while the price of services (also an index) are determined at home. The real exchange rate is the ratio of the services price index to manufacturing price index. The service and manufacturing sectors must raise wages to keep workers as they are drawn to the booming sector—the well-known *resource-movement effect*. While the service sector can increase prices to offset the higher wages, manufacturers cannot—hence, we have an appreciation of the real exchange rate and lower profit margins in manufacturing. The higher wages in the booming resource and service sectors increase aggregate demand—the famous *resource-spending effect*, further increasing the price of services and appreciating the real exchange rate.

Dutch-disease models clearly omit the role of the monetary economy and a central bank. Moreover, the demand effects associated with the resource-movement and resource-spending effects are counteracted when resource rents are spent on non-resource imports (capital goods, consumer durables and intermediate inputs), which expand domestic supply and engender productivity effects, thereby easing inflationary pressures.

Our contributions to this literature are twofold. First, we provide a transparent theoretical framework combining the real and monetary sectors for exploring the effects of large inflows of oil rents and central bank money creation on the real exchange rate and the local foreign exchange market. Second, we provide a systematic analysis of two relatively new oil-based economies: Guyana and Ghana, which has just over a decade of experience in offshore oil production. Specifically, we focus on the monetary aspects of the surge in oil rents and probe what Ghana can teach Guyana. The case study approach is extremely valuable for complementing studies using cross-country and panel regression methods. It allows us to draw lessons from both countries; for example, the similarities in the political system that incentivize monetization.

Incorporating the monetary sector is crucial because the central bank can finance government expenditures beyond what is possible through natural resource rents, foreign and domestic borrowing, and taxation. Central bank monetization creates a mismatch between the money demanded if the government relied solely on these sources (taxation, debt and oil rents) and the money stock resulting from central bank financing. This mismatch or *excess money* balances generates an *excess demand* for goods and services, driving up inflation, and creates an *excess demand* for foreign exchange. In a flexible exchange rate system, such as Ghana's, this leads to a depreciation of the nominal exchange rate. In a fixed or managed exchange rate system, such as Guyana's, it causes a foreign exchange shortage. Our accounting for different exchange rate systems implies that the real exchange rate appreciates in Guyana and depreciates in Ghana. We document empirical evidence in support of these predictions.

There is limited literature integrating the monetary sector into Dutch-disease models. Neary (1985) is a notable exception, proposing a model that includes the money market but is geared towards developed economies. In Neary's model, government spending of oil rents does not involve central bank monetization as the money supply is fixed, leading to higher interest rates and an appreciation of the real exchange rate. Prati and Tressel (2006a;b) also address this issue by incorporating both real and monetary sectors to assess how monetary policy can mitigate real exchange rate appreciations caused by foreign aid inflows. They highlight that while monetary expansion typically accompanies foreign aid inflows, sterilization of these funds through bond sales can counteract this effect.

However, when aid inflows are used to purchase imports, bank deposits and reserves are sterilized. We emphasize that while aid inflows, public sector foreign borrowing, and resource rents increase the money supply when spent in local currency, they reduce the money supply when spent on imports in foreign currency. Ergo, only central bank monetization of the fiscal deficit in aid-dependent countries can account for the net increase of the money supply and the inflation rate. Overall, our study is consistent with this observation.

Hussain et al. (2009) clearly demonstrate this point for five aid-dependent countries between 1999-2003: Uganda, Tanzania, Mozambique, Ghana, and Ethiopia. The central banks of Uganda, Tanzania, and Mozambique monetized the fiscal deficit beyond the aid inflows, as government spending from incremental aid often exceeded the amount absorbed through imports. Absorption refers to converting aid into foreign exchange to purchase imports. These central banks accumulated foreign aid as international reserves and monetized fiscal deficits. This led to an excess supply of money balances and real exchange rate appreciation or depreciation, depending on the exchange rate regime. Unlike Prati and Tressel (2006a;b)'s contention, sterilization efforts were ineffective in preventing real exchange rate distortions. For detailed analyses of these cases, readers should refer to Hussain (2007) and Aiyar (2007a;b). A quote from Aiyar is instructive:

> In Mozambique, there was a significant increase in aid inflows starting around 2000, the year that floods hit the country. Over a four-year period, aid absorption, though considerable, lagged well behind spending out of aid. In fact, government expenditures increased by well over 100 percent of the increment in aid. Hence, there was a large injection of domestic liquidity into the economy. Sterilization through treasury bill sales proved insufficient to check inflationary pressures. Inflation remained in the 10 to 15 percent range for most of the period. The authorities proved reluctant to use foreign exchange sales as a means of sterilizing the liquidity injection [...] (Aiyar 2007a: 65-66).

The article is organized as follows. Section 2 provides an intuitive model connecting the real and monetary sectors. Section 3 presents the key time-series facts and section 4 concludes.

# 2   A Simple Diagrammatic Model

An intuitive model that integrates the real and monetary sectors is proposed for a small open economy that discovers a natural resource, such as hydrocarbons. Our model is a cousin to the aggregate demand-aggregate supply model with some important differences. First, aggregate supply is composed of non-resource (non-oil) domestic output (*DS*) and non-resource imports (*IM*).[3] Further, non-resource domestic output is positively related to the flow of non-resource imports. The basic idea is that non-tradable non-oil output (e.g. construction, real estate services, warehousing, domestic transportation, education, legal services, among others) also requires imported inputs. Second, demand is the sum of domestic expenditures and non-resource (non-oil) exports and is denoted by (*DX*), since we independently account for non-resource imports.

Crucially, the expenditure of resource rents to finance imports increases both *DX* and aggregate supply. First, when resource rents are spent in local currency units, they raise domestic expenditures and increase the demand for non-oil imports such as food, capital goods, technology services, and intermediate inputs. These expenditures are undertaken by the fiscal authority, often through withdrawals from a sovereign or natural resource fund to finance critical public infrastructure, etc. Second, when resource rents are spent in USD, they increase aggregate supply by expanding non-resource imports. This is essential because an increase in domestic expenditures cannot be sustained without a corresponding increase in non-resource imports in an open economy, otherwise, inflation ensues. Thus, resource-financed fiscal expenditures simultaneously raise both the demand and supply of foreign goods and services.

Figure 1 panel (a) shows the initial equilibrium in the goods market. Consistent with conventional theory, the *DX* and *DS* curves have the familiar slopes. However, the supply of non-resource imports is perfectly inelastic as these are independent of domestic prices. Moreover, aggregate supply or the resource constraint is realized when the non-resource import and domestic supply curves intersect (*IM = DS*). Initial equilibrium is depicted by $P_0$ and $Y_0$, which represent the aggregate price level and non-oil GDP, respectively. Equilibrium in the goods market corresponds to equilibrium in the money market, shown in panel (b), where money demand and money supply are

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[3] Imports related to the natural resource (oil) sector are excluded as they do not contribute to the productive capacity of the non-resource economy.

balanced ($M_d = M_s$). Money market equilibrium occurs along the 45-degree line, with the initial equilibrium stock of money denoted by $M_0$. Panel (c) illustrates the local foreign exchange market, where the initial equilibrium exchange rate is $E_0$, and the stock of foreign exchange traded is $FX_0$. The nominal exchange rate reflects the local currency units per USD, and an increase in $E$ indicates a nominal depreciation of the local currency.

**Figure 1:** Resource-Financing of the Non-Oil Fiscal Deficit
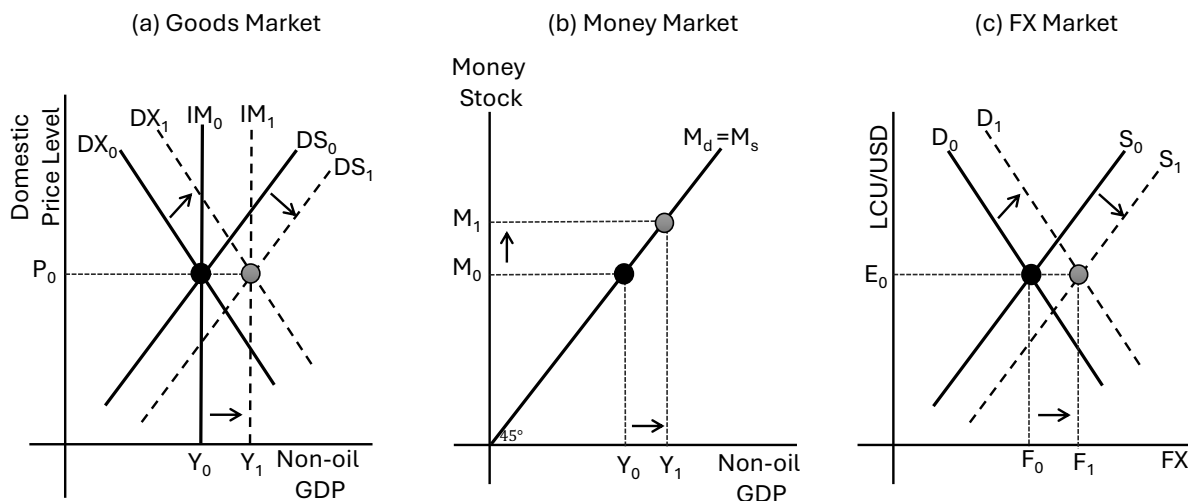


Assume that the central government increases its non-resource fiscal deficit by an amount equal to the resource rents withdrawn from a wealth fund. This shifts the demand curve outward from $DX_0$ to $DX_1$ in panel (a) as government spending increases, which raises the demand for foreign items and shifts the FX demand curve from $D_0$ to $D_1$ in panel (c). The demand for foreign goods, services and assets (foreign exchange) is a derived demand as government *initially* deficit spends in local currency units, creating an *excess demand* for both goods and foreign assets. In other words, the supply of foreign goods, services and foreign currencies into the local economy—financed by the foreign exchange withdrawn from the sovereign wealth fund—must increase to clear the goods and foreign exchange markets, respectively.

Therefore, government directly finances key non-resource imports and sells the remaining foreign exchange to the private sector to further expand non-resource imports. It follows that the supply of foreign exchange increases from $S_0$ to $S_1$ to accommodate the higher demand for non-resource imports. This permits two key adjustments in the goods market. First, the import curve shifts from $IM_0$ to $IM_1$, and second, the domestic supply curve shifts from $DS_0$ to $DS_1$ owing to the productivity effects of non-resource imports (e.g. software, computers and capital goods). No-

tably, the aggregate price level remains unchanged at $P_0$ and non-oil GDP rises to $Y_1$.[4] In the FX market, the nominal exchange rate remains stable at $E_0$, but the volume of FX traded increases to $FX_1$. Finally, panel (b) shows that as non-oil GDP expands, the transaction demand for money also increases, and the money supply increases endogenously from $M_0$ to $M_1$ to restore money market equilibrium. The result of our model is summarized below.

**Theorem 1** (Resource-Financed Fiscal Deficits). *When the non-resource fiscal deficit is exclusively financed by resource rents, equilibrium is maintained across the goods, foreign exchange, and money markets without affecting price levels—the aggregate price level and nominal exchange rate remain stable.*

Next, we outline the effects when the non-resource fiscal deficit is financed by both resource rents and central bank money. In this scenario, there is an additional increase in domestic expenditures and the demand for foreign exchange. However, this larger fiscal deficit is not financed by foreign currencies—leading to potential macroeconomic challenges. Figure 2 illustrates the mechanics. When the fiscal deficit is money-financed in net terms—after accounting for foreign borrowing, external aid, and resource rents—demand rises from $DX_1$ to $DX_2$, leading to a planned increase in domestic supply from $Y_1$ to $Y_2$. Note carefully that output level $Y_2$ is above the level consistent with aggregate supply or the resource constraint, where $IM_1 = DS_1$. It follows that the economy is overheating at $Y_2$ and the domestic supply curve must shift to $DS_0$ to clear the goods market.

Why does domestic supply contract? First, wage growth exceeds labor productivity growth at $Y_2$ and there is a reduction in domestic supply because of a *profit squeeze*. Second, the planned domestic supply of $Y_2$ cannot be realized because of insufficient imports, that is, there is an *import squeeze*. Consider that the planned increase in housing stock is $Y_2$, but there are too few imported cement and steel for housing construction. Then, the domestic supply curve must contract to $DS_0$ and raise the overall price level from $P_0$ to $P_1$.

In panel (b), central bank monetization creates an *excess supply* of money, which accounts for the excess demand of goods and foreign exchange. Panel (c) provides the simple analytics of the foreign exchange market. As demand increases to $DX_2$, the demand curve for foreign exchange shifts from $D_1$ to $D_2$ and depreciates the nominal exchange rate from $E_0$ to $E_1$. However, the exchange rate remains at $E_0$ in a fixed exchange rate regime, which engenders an excess demand

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[4]It is important to note that without the growth in non-resource imports, prices would rise. Although fiscal multipliers in small open economies are estimated to be well below unity, fiscal deficits still influence demand and prices.

**Figure 2:** Money-Financing of the Non-Oil Fiscal Deficit
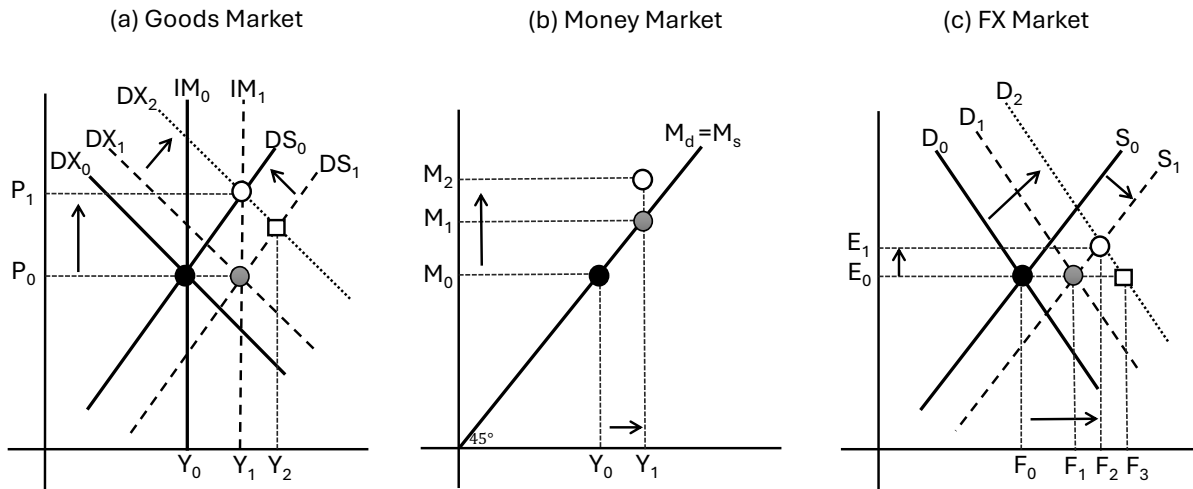


for foreign exchange or FX shortage, indicated by the gap, $F_3 - F_1$. These results are summarized in the following Theorem.

**Theorem 2** (Money-Financed Fiscal Deficits). *When the non-resource fiscal deficit is financed by central bank money creation in net terms:*

*(i) The overall price level increases.*

*(ii) A foreign exchange shortage occurs under a fixed peg, while the nominal exchange rate depreciates in a flexible or quasi-flexible exchange rate system.*

*(iii) An excess supply of money balances is generated.*

A Corollary of Theorem 2 is that central bank money creation engenders real exchange rate appreciations ("Dutch disease" effect) and depreciations, which are outlined below.

**Corollary 1** (Money-Financed Fiscal Deficits and the Real Exchange Rate). *When the non-resource fiscal deficit is financed by central bank money creation in net terms:*

*(i) It leads to an appreciation of the real exchange rate in fixed or managed exchange rate regimes.*

*(ii) In flexible exchange rate systems, it causes the real exchange rate to depreciate if the rate of currency depreciation exceeds the domestic and foreign inflation rate differential; otherwise, the real exchange rate appreciates.*

The central idea of this Corollary is that the phenomenon known as the Dutch disease is a monetary phenomenon, which is a function of the lack of political consensus for central bank

independence. Traditional models of Dutch disease typically overlook the role of the monetary sector, with Neary (1985) being a notable exception—though his model operates under the assumption of a fixed money supply, that is, no money-financed fiscal deficits. Additionally, these models often neglect the relationship between aggregate supply and non-resource imports, which are funded by resource rents.

Further details can be found in the Appendix, which provides a sectoral analysis of the real exchange rate.

# 3   Analytical Narratives

Ghana and Guyana are new to offshore oil production, respectively discovering oil in July 2007 and May 2015. Production levels in both countries were quickly scaled up by the foreign multinationals which made the discoveries.[5] Ghana's first barrel of offshore oil was pumped in December 2010; Guyana's first barrel came in December 2019. Guyana is therefore a frontier oil producer, while Ghana has some more experience in oil production. The experiences of Ghana should provide insights into where Guyana is heading given its decade lead relative to its Caribbean counterpart.[6]

Already there is a significant difference in terms of the total revenues going to the respective governments, production levels and budgetary support. The scale of Guyana's discoveries is much larger than that of Ghana's. For example, Guyana produced 141 million barrels of oil in 2023; and its annual production is expected to exceed 230 million barrels in 2024 and move even higher by 2027. In 2023, Ghana's annual oil production declined by 23.2 percent from its 2019 production level of 71.44 million barrels. The cumulative oil revenue received by Ghana's government since the initial production amounts to US$9.85 billion (PIAC 2023), while the Guyana government's cumulative oil revenue for the period 2000 to June 2024 amounts to US$4.86 billion (NRF 2024).

Interestingly, Guyana—with its generous withdrawal rule from its Natural Resource Fund—has already extracted US$2.2 billion (45.2 percent) for budgetary support over a 2.5-year window (NRF 2024). Over the entire production period from 2011 to 2023, Ghana withdrew US$3.92 billion or 39.8 percent of the total received for budgetary support (PIAC 2023).

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[5]ExxonMobil holds a majority stake in the Guyanese operations, followed by minority stakeholders Hess and CNOOC. In Ghana, the main multinationals are Tullow, Kosmos Energy and previously Anadarko Petroleum.

[6]Geographically, Guyana is located on the northern South American mainland, but is culturally connected with the English-speaking Caribbean islands, and economically joined in the Caribbean Community Common Market (CARICOM).

## 3.1 Fiscal Indicators

The first row of Figure 3 shows fiscal outcomes using data for the non-oil primary fiscal balance and non-oil GDP.[7] The average non-oil primary fiscal balance is -7.4 percent for Guyana from 2011 to 2023, while the average over the same period for Ghana is -7.8 percent. While Ghana's rate tends to fluctuate around the long-term average of -7.8 percent, Guyana's rate has exploded since 2018, reaching a spectacular -28.8 percent of non-oil GDP in 2023. It might be that Guyana's fiscal authority anticipates extremely optimistic streams of future oil revenues. Indeed, the government appears to have an extremely optimistic expectation of future streams of oil rents, motivating it to table new legislation to increase the already generous withdrawal rule from the Natural Resource Fund (StabroekNews 2024; Oilnow 2024).

The second chart in the first row of Figure 3 shows Guyana's total tax revenues relative to non-oil GDP, which has an upward trajectory reaching 29.6 percent in 2023. This implies, given the non-oil fiscal deficit of 28.8 percent, that the Guyana government's fiscal expenditure is 58.4 percent of non-oil GDP in 2023. On the other hand, Ghana's non-oil tax ratio averages 13.8 percent over the review period with no clear trend.

The bottom row of Figure 3 shows the total debt (domestic and foreign) as a percentage of GDP as well as the annual debt service cost as a percentage of GDP from 1997 to 2023. Ideally, we wanted to scale debt service and total debt by non-oil GDP, but we could not find a consistent GDP series—using the same methodology—for the longer review period from 1997 to 2003. Therefore, we used the total GDP to scale the debt indicators. Both countries exited the 1990s with a debt-to-GDP ratio exceeding 100 percent—Guyana's rate was 101 percent in 1997, and Ghana's was 120 percent in the same year. Relative to Guyana's, the debt-to-GDP ratio fell precipitously until 2006 in Ghana. Guyana's rate was relatively more persistent still averaging around 102 percent from 2001 to 2003. Nevertheless, the debt-to-GDP ratio for Guyana would fall steeply after 2005 to just 27 percent in 2023. Both countries benefitted from debt relief after launching Economic Recovery Programs (ERPs) and Structural Adjustment Programs (SAPs) in the 1980s.

Ghana's debt relative to GDP would increase steeply from 18.5 percent in 2006 to 86.1 percent in 2023. One explanation for this steep increase is the high expectation of success and good times (Mohammed et al. 2022). The second and related explanation has to do with the tight electoral competition and the limited checks and balances associated with Ghana's presidential system

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[7]We calculate Ghana's non-oil GDP as nominal GDP in Cidi minus (Brent oil price)$^*$(oil production)$^*$(nominal exchange rate). Guyana's non-oil GDP—using a consistent methodology—for the review period is available from the Bank of Guyana Statistical Bulletin (various years).

(Banful 2011; Bawumia and Halland 2018). Essentially, the President is required to choose from Members of Parliament to become ministers of government. However, given the structure of the electoral system, the parliamentary members are typically part of the President's party. Moreover, government spending in Ghana and several other African economies tend to increase before elections—consistent with the prediction of the political business cycle theory (Mosley and Chiripanhura 2016).

**Figure 3:** Fiscal Indicators of Ghana and Guyana
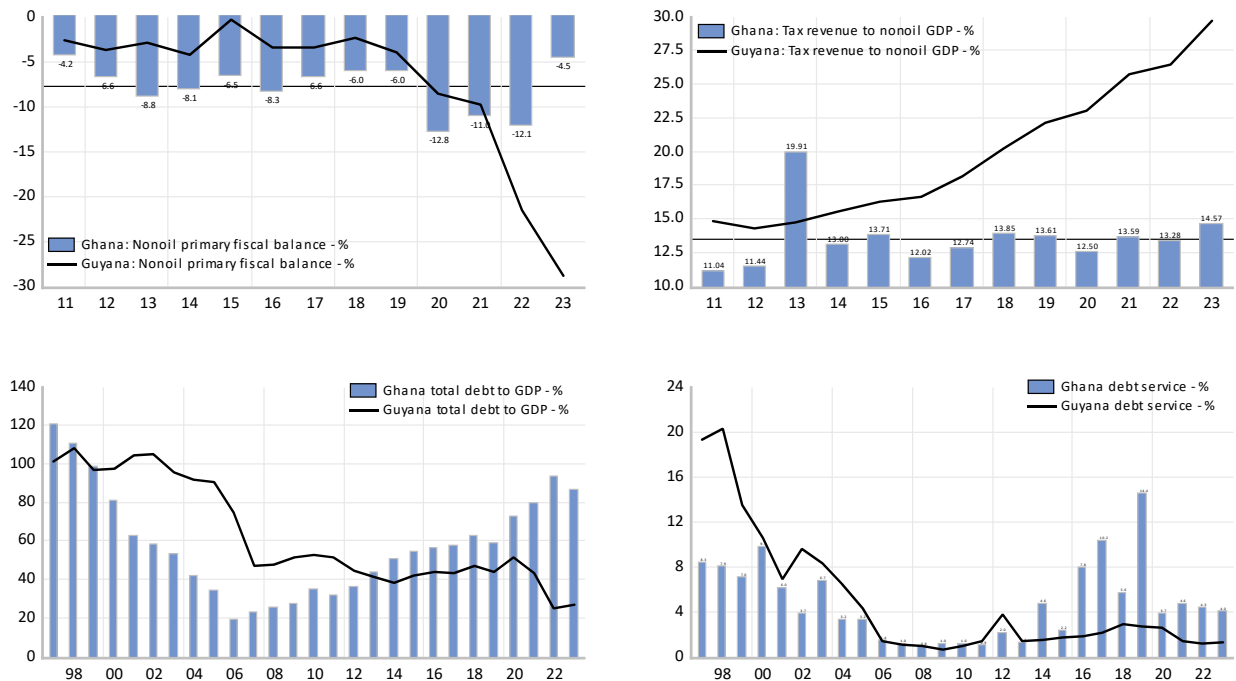


*Notes*: Years are on the horizontal axes and percentages are on the vertical axes. Data is sourced from the Bank of Ghana's online Database Portal, Annual Report (2023)—Public Interest Accountability (PIAC), Bank of Guyana's Statistical Bulletins (various years), St. Louis Federal Reserve Economic Data, IMF Article IV for Guyana (various years), and World Development Indicators.

Substantial promises were made during the campaigns for the 2008 Ghana election which came just after the discovery of oil. The low margin of electoral success implies that leaders have a high probability of not being re-elected; therefore, they place a high discount rate on the future and are incentivized to boost spending in the current period—even though policymakers may be aware of the perils of excess spending (Ross 1999; Persson and Tabellini 2000). Ghana's debt-to-GDP ratio fell from 93 percent in 2022 to 86.1 percent in 2023, partly because of the IMF terms associated with a US$3 billion External Credit Facility Arrangement. The 2012 election was also highly competitive, and it consolidated the *de facto* two-party electoral system—even though more than

two parties compete. Though Ghana is a highly multi-ethnic society, its political economy tends to be centered around two large groups that respectively predominate in two political parties (Sefa-Nyarko 2021).

After stabilizing at an average of 1.02 percent over the period 2006 to 2011, Ghana's debt service cost increased significantly owing to the greater post-2006 borrowing. In 2019, debt service amounted to 14.4 percent of GDP and averaged 6.8 percent of GDP for the period 2016 to 2023. Meanwhile, Guyana's debt service cost has fallen significantly since the late 1990s and early 2000s, averaging 1.96 percent over the period 2016 to 2023 following a substantially higher average debt service cost of 11.85 percent over the period 1997 to 2004.

## 3.2 Monetary Indicators

Key indicators of the monetary economy are presented by Figure 4. First, we document the real monetary base (MB), which is a liability of any central bank and the sum of currencies in circulation and commercial banks' reserves. Second, we measure the money market equilibrium by the stability of the M2 money multiplier, that is, the ratio of broad money (M2) to MB. Broad money or M2 is the sum of currencies in circulation, checking accounts, savings account and time deposits. A stable money multiplier indicates equilibrium in the money market, where money demand and money supply are in balance. In contrast, there is excess money balances in the market when the multiplier falls, and the reverse is true. A falling ratio is consistent with central bank's creation of base money to finance the fiscal deficit.

We also construct a measure of real monetization based on the sources of the monetary base by subtracting the level of government's central bank deposit balance from the central bank's direct lending to government.[8] This measure of monetization captures the more exogenous component of narrow money supply determined by fiscal action. The MB captures the more endogenous aspect of the narrow money supply because of central bank interventions in the foreign exchange market. When the central bank accumulates or decumulates international reserves, there is an impact on MB if no counteracting measure is taken.

Note, if the government runs an overdraft (negative balance) on its central bank account—as has been the case in both Ghana and Guyana—our measure of central bank monetization increases more sharply. Finally, we document the change in relative prices by employing the CPI-adjusted

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[8]The deposit balance is a domestic liability of the central bank and its direct lending to government is a domestic asset.

real effective exchange (REER), where an increase indicates a real appreciation or loss of external competitiveness.

### 3.2.1 Ghana

The first row in Figure 4 presents the evolution of central bank monetization in Ghana. It is clear from the first column that the stock of the real monetary base (MB) increased at a faster rate after offshore oil was discovered in July 2007. As a matter of fact, the trend of MB steepened from the third quarter of 2009—a year before the first barrel of oil was produced. The steep increase in the monetary base maps closely with a sharp increase in our monetization measure on account of large central bank lending to government, as well as overdrafts on government's account at the Bank of Ghana from June 2012 to August 2014. The second column confirms that the increase in central bank monetization engineers an excess supply of money balances as the money multiplier falls from 2009 to 2014. It is transparent that the fiscal deficit was money-financed in net terms since the discovery of oil and "first barrel" in Ghana.

Following Theorem 2 (i) and (ii), we expect an increase in the price level and a nominal exchange rate depreciation. Ghana's exchange rate relative to the USD depreciated by 107.1 percent between 2009-2014, while its consumer price index increased by 69.9 percent over the same period. These changes imply a depreciation of the REER, which is consistent with our prediction outlined in Corollary 1 (ii). The REER is denoted by the vertical bars in Figure 4, which shows a clear depreciation from 2009 to 2014. From 2014 to 2020, it is evident that the money multiplier had increased, and the monetization remained stable, indicating diminished central bank monetization. It is striking that the REER is relatively steady throughout this brief period, which is consistent with the prediction of Theorem 1.

Since 2020, Ghana has returned to central bank monetization, as evidenced by a sharp increase in the monetization measure and a notable decrease in the money multiplier. Contrary to what might be expected, the REER has remained relatively stable since 2020. This stability can be explained by the inflation trends in Ghana and the USA. For instance, inflation in Ghana rose by 288.7 percent from 2020 to 2023, while in the USA it increased by 241.6 percent, leading to a real appreciation of 47.1 percent. Despite this, Ghana's nominal exchange rate experienced a significant depreciation, which has contributed to the relative stability of the REER. Overall, Ghana's REER has been on a downward trend since 2011, with the nominal exchange rate depreciating by 629.4 percent and the consumer price index rising by 400.4 percent between 2011 and 2023. These

**Figure 4:** Monetary Indicators of Ghana and Guyana
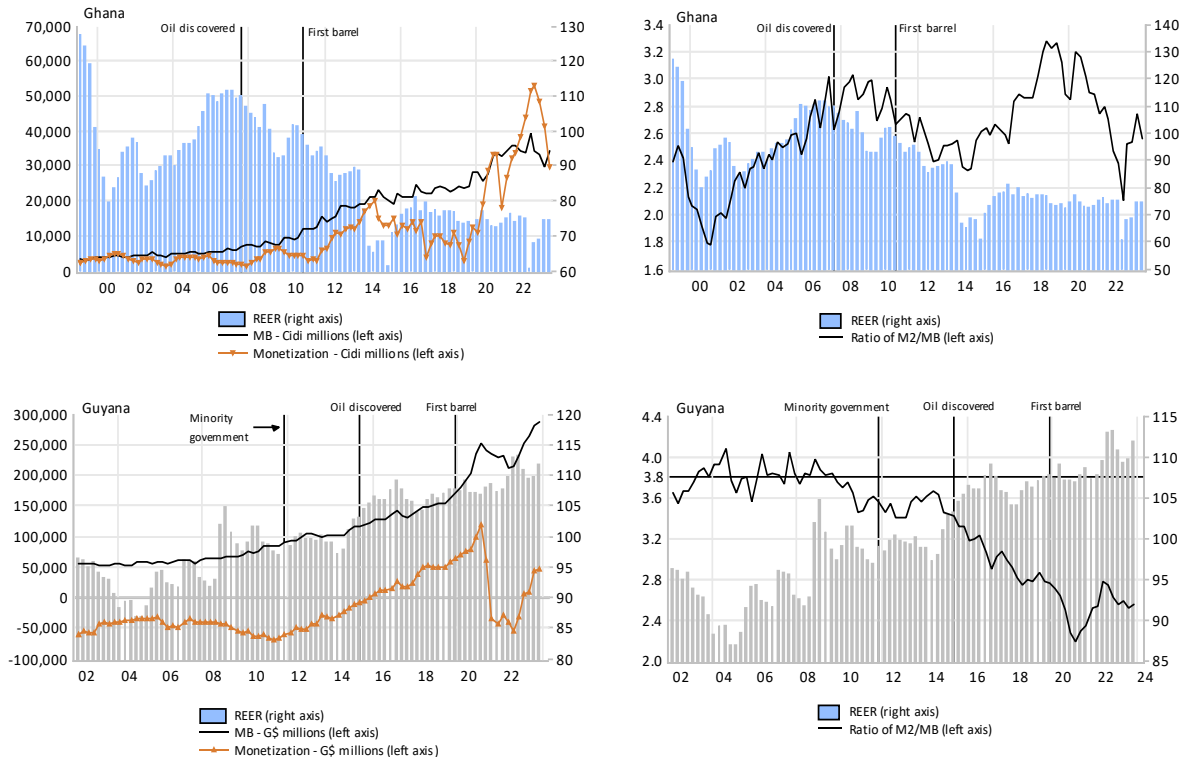
*Notes*: Years are on the horizontal axes, and Ghanaian Cidi, Guyana dollars as well as percentages are on the vertical axes. The data is sourced from the International Financial Statistics, Bank of Ghana's online Database Portal, and Bank of Guyana's Statistical Bulletins (various years).

observations are consistent with our predictions, highlighting central bank money creation as the key explanatory variable. This finding is supported by empirical evidence indicating that inflation in Ghana is primarily driven by central bank money creation and exchange rate depreciation (Valog et al. 2023; Boamah 2019; Adu and Marbuah 2011; Ocran 2007). Additionally, Boamah (2019) identifies significant short- and long-term effects of import inflation.

Consider the period in Ghana from 2000 to 2006, before the oil boom, when the base money multiplier was increasing, the monetization variable remained relatively stable, and the real effective exchange rate (REER) was appreciating. The money multiplier increases with an increase in bank credit, which expands bank deposits and thus the money multiplier. This indicates a credit-driven expansion in domestic demand, with domestic credit as a percentage of GDP growing from 11.9 percent in 2001 to a peak of 15.5 percent in 2005—a 30.2 percent increase over four years. During this time, import prices surged by 127.1 percent, reflecting significant import inflation as the consumer price index increased by 83.1 percent. Both the credit expansion and import inflation

contributed to higher domestic inflation rates.

Additionally, Ghana experienced a gold boom from 2004 to 2012 (Hausermann et al. 2018), which led to stronger wage growth and increased domestic demand, supported by higher imports and the expansion of aggregate supply funded by foreign exchange from the gold sector. Still, there is a *net increase* in aggregate demand through private credit creation *without* new inflows of foreign assets, which raises inflation in conjunction with higher import prices; hence, the appreciation of the REER. It follows that the dynamics of the REER in pre-oil Ghana is also consistent with our framework.

### 3.2.2 Guyana

The second row of Figure 4 indicates a familiar monetization story: the level of MB and monetization rose substantially once oil is discovered in Guyana. Like Ghana, Guyana has a presidential system as well as extremely competitive general elections and bi-communal ethnic cleavages (Khemraj 2021; Edwards 2021). In 2011, the incumbent administration again won the election, but with a minority of the votes since the Guyanese electoral and constitutional laws allow a party to form a government with less than 50 percent of the votes, providing it won the highest percentage. Also, like Ghana, there are limited checks and balances against the President who can select the Members of Parliament from a list. Citizens vote for the party list and not for a representative for a specific constituency. However, because of having fewer MPs in 2011, the government was unable to raise the debt ceiling to expand borrowing from the banking system. Instead, it turned to central bank financing, primarily by running down its balance at the central bank, which eventually turned into overdrafts from mid-2015 to mid-2021 at the Bank of Guyana—Guyana's central bank (Khemraj 2024). Therefore, Guyana's monetization commenced before the discovery of oil in mid-2015, but accelerated after the oil was discovered and more so after oil production.

A new government (the Granger administration) came into power in May 2015, the same month oil was discovered, by winning the election with a margin of less than one percentage point. Interestingly, the new government failed to raise the debt ceiling despite its slim majority in Parliament. Maybe the debt ceiling would have been increased had it not been for the successful vote of no confidence in December 2018 after one government MP deserted and voted with the opposition. The Granger government challenged the no confidence vote in the courts and remained in power until August 2020. The incumbent government lost the March 2020 election but did not willingly give up power—a behavior predicted by the political economy literature of the resource curse (Persson

and Tabellini 2000). Pressure of sanctions on individual members of government from the United States eventually incentivized the incumbents to concede to the change in government in August 2020, five months after the election was held.

The new government (Ali administration) decided to settle the cumulative overdraft balance of G$135 billion (or 12.2 percent of Gross National Income) with the Bank of Guyana (Khemraj 2024). In doing so, it merely poured old wine in new bottles. The Bank of Guyana purchased bonds (called debentures) directly from the government and deposited the proceeds into the government's central bank account, thereby taking the account into positive balance. This is why MB and monetization both fell precipitously and momentarily in mid-2021. From the second quarter of 2022, the Guyana government is borrowing directly from the Bank of Guyana instead of running overdrafts; therefore, we see the increase in monetization and MB for the rest of the review period.

The final point to note from Figure 4 is the stable M2/MB ratio (the multiplier) of 3.8 for Guyana from 2002 to 2009. The money multiplier trended downward after 2009 until the end of review period as monetization intensified. We observe the appreciation of the REER over the entire review period, which is consistent with our prediction of a fixed or managed exchange rate regime (Corollary 1 (i)). The CPI increased by 146 percent from 2000 to 2023, while the nominal exchange rate depreciated by 17 percent over the same period. However, the trend increase of the REER was gradual over the review period.

It is important to investigate why the real effective exchange rate (REER) appreciated by 13.5 percent between 2004 and 2010, despite the money multiplier and monetization remaining relatively stable during much of that period. Like Ghana, Guyana experienced a gold boom from 2004 to 2012 (Laing 2019). Hilson and Laing (2017) document a movement of unskilled laborers and machine operators from the agricultural sector to the gold sector. Thus, the gold boom led to stronger wage growth and increased aggregate demand, while also supporting higher import growth and expanding aggregate supply, which in turn mitigated inflationary pressures. This is consistent with our framework and the empirical evidence, which shows no significant statistical or economic relationship between wages and inflation in Guyana. Instead, the literature highlights that excess money supply and import prices are the primary sources of inflation in Guyana and other Caribbean economies (Cevik and Zhu 2020; Solomon 2013). Therefore, the appreciation of the REER must be explained by other factors.

Three points are worth noting. First, Guyana experienced a major flood in 2005, which led to a 0.6 percent decline in GDP per capita (BOG 2005: 9) and contributed to a 46.8 percent increase in inflation between 2004 and 2005. Second, the import value index rose by 114.4 percent from 2004

to 2010, correlating with a sharp increase in the inflation rate from 2004 to 2007. Finally, Guyana implemented the value added tax (VAT) in January 2007, likely contributing to a large spike in inflation in 2007 and a smaller increase in 2008.

## 3.3   Public Employment

The overdraft system allows the government to monetize its fiscal outlays, e.g. civil servants' wages and purchase other non-tradable services—since these are priced in local currency. However, imports can only be financed with foreign currency. Indeed, during the period when Guyana accumulated an overdraft, the government expanded the civil service from 14, 905 employees in 2015 to 26, 354 employees in 2018—the last period for which there are publicly available data—representing a 76.8 percent increase (BOS 2024).

**Table 1:** Central Government Emolument relative to Total Taxes and Non-Oil GDP

| GHANA | Total Tax: Cidi millions | Govt Emoluments: Cidi millions | Emoluments to Tax: % | Nonoil GDP: Cidi millions | Emoluments relative to Nonoil GDP: % |
|---|---|---|---|---|---|
| 2018 | 37,748 | 19,612 | 52.0 | 288,105 | 6.8 |
| 2019 | 42,355 | 22,033 | 52.0 | 332,425 | 6.6 |
| 2020 | 44,448 | 28,269 | 63.6 | 376,181 | 7.5 |
| 2021 | 56,433 | 31,663 | 56.1 | 439,001 | 7.2 |
| 2022 | 75,548 | 39,434 | 52.2 | 570,212 | 6.9 |
| 2023 | 93,748 | 43,000 | 45.9 | 797,226 | 5.4 |
| | | **Average** | **53.6** | | **6.7** |

| GUYANA | Total Tax: G$ millions | Govt Emoluments: G$ millions | Emoluments to Tax: % | Nonoil GDP: G$ millions | Emoluments relative to Nonoil GDP: % |
|---|---|---|---|---|---|
| 2018 | 198,512 | 59,452 | 29.9 | 982,000 | 6.1 |
| 2019 | 225,993 | 68,551 | 30.3 | 1,023,800 | 6.7 |
| 2020 | 218,330 | 71,852 | 32.9 | 949,200 | 7.6 |
| 2021 | 255,086 | 77,812 | 30.5 | 992,800 | 7.8 |
| 2022 | 292,337 | 87,760 | 30.0 | 1,107,100 | 7.9 |
| 2023 | 366,515 | 104,938 | 28.6 | 1,236,800 | 8.5 |
| | | **Average** | **30.4** | | **7.4** |

*Notes*: The data is sourced from the Bank of Ghana's online Database Portal, Bank of Ghana Statistical Bulletin (various years), and Bank of Guyana's Statistical Bulletins (various years). Public Interest Accountability (PIAC) Report.

In both Ghana and Guyana, total emoluments of central government workers account for a sizable share of total tax revenues. This information is presented in Table 1 for the period 2018 to

2023—a period over which we could obtain consistent data for both countries. The government's emolument bill—which appears to be trending downward—averages 53.6 percent of total tax revenue for the review period in the case of Ghana. Relative to non-oil GDP, the bill averages 6.7 percent in Ghana and is also trending downward. In contrast, Guyana's average remuneration bill is 30.4 percent relative to tax revenues, while the average as a share of non-oil GDP is 7.4 percent. The latter is trending *upward* in Guyana. One explanation of this is the increase in part-time employment by the central government—a form of jobs guarantee program, which was a major part of an election manifesto promise by the present government (GuyanaTimes 2023).

## 3.4   Foreign Exchange Market

Following Theorem 2 (ii), we are interested in studying the effect of net monetization on the domestic foreign exchange market over the period 1999Q1 to 2024Q1. We use the exogenous measure of monetization to observe how it is correlated with the nominal exchange rate and the change in central bank's international reserves. Recall, our monetization measure is the sum of the level of central bank lending to government minus the level of government's deposit at the central bank. Overdrafts or negative balances are therefore added to direct lending to government. As noted earlier, Ghana has a flexible exchange rate while Guyana has a managed exchange rate.

It is clear from the first row of Figure 5 that there is a positive relationship between monetization and the nominal exchange rate, where an increase in the latter indicates a depreciation. As expected, there is a larger depreciation in Ghana, evidenced by the steeper trend line, given the flexibility in the exchange rate. We also explore the association in differences by calculating the first difference, the two-quarter lag, three-quarter lag and the four-quarter lag in the exchange rate and monetization. Space constraint does not allow us to report all the results, but the two-quarter difference is reported in the second row. It is evident that an exogenous increase in monetization engineers an excess demand for FX and depreciates the nominal exchange rate.

Finally, we want to know whether there is a quantity effect. Does monetization decrease central bank holdings of international (FX) reserves? International reserves can change because of valuation adjustments; however, there should still be a pattern of a negative relationship, which is exactly what we found in first differences for both countries (Coppin 1994). This quantity measure confirms that monetization creates a FX shortage and requires the central bank to sell foreign assets to the private sector, thus the reduction in its FX reserves.

**Figure 5:** Monetization and the Local Foreign Exchange Market
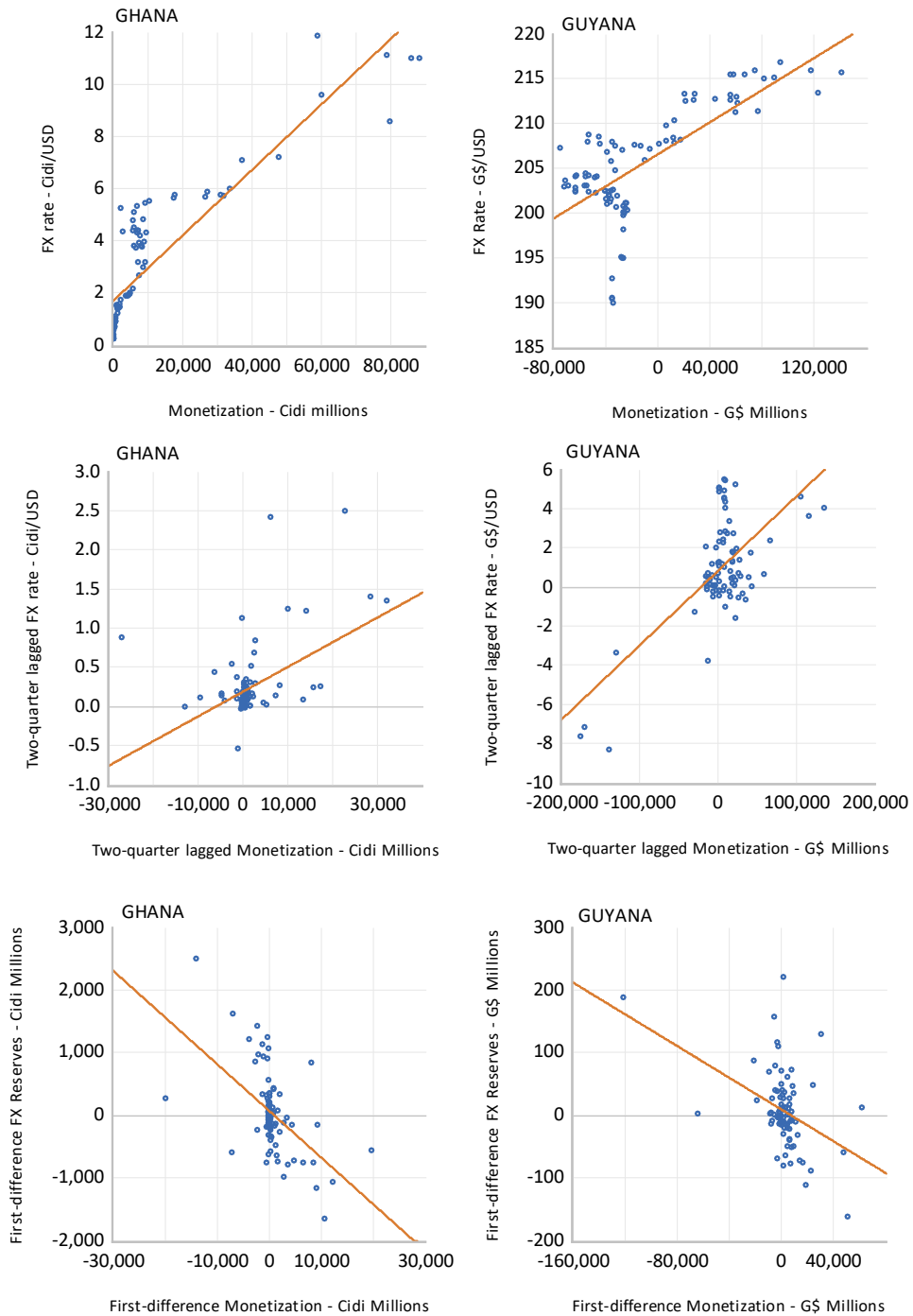
# 4 Conclusion

This article outlines two distinct phases in the fiscal development of Guyana and Ghana: (i) periods of prudent central banking, avoiding the monetization of fiscal deficits, and (ii) periods characterized by significant deficit monetization. In Ghana, monetization remained relatively low between 2000 and 2007, while in Guyana, it was similarly restrained from 2000 to 2011. However, following Ghana's oil discovery in 2007 and budget cuts by Guyana's parliament in 2011, central bank financing increased sharply, with a further surge after Guyana's oil discovery in 2015.

We develop a simple model to illustrate the competing effects of central bank monetization and the spending of oil rents on the real exchange rate and the local foreign exchange market. The basic idea is that oil rents are used for purchasing imports of consumer and capital goods—both of which exert a downward pressure on domestic prices through an expansion of domestic supply and productivity gains. It follows that the demand and inflationary effects of oil-financed expenditures are negated by the import-supply nexus. However, oil rents are not needed for government purchase of non-tradables and the payment of civil servant salaries—hence, providing the opportunity for rapid money creation under political pressure. Thus, foreign exchange shortages and real exchange rate distortions.

Monetization is associated with a depreciation of Ghana's real exchange rate during the oil boom. This depreciation is inconsistent with the prediction of the Dutch-disease theory. On the other hand, we demontrate that Guyana's real exchange rate appreciated before and after the discovery of oil. We document several pre-oil explanatory factors, such as political instability, import inflation, natural disasters, and the implementation of the value added tax, while monetisation is an important driver of the real appreciation and foreign exchange shortages after oil discovery.

Therefore, central bank money creation and the import supply response from spending oil rents are crucial omitted variables in the empirical Dutch-disease literature. Future studies estimating the impact of resource rents on the real exchange rate should account for these factors.

Our study implies that a sovereign wealth fund is insufficient for effectively managing large inflows of natural resource rents. Effective management requires political moderation to maintain central bank discipline. Political moderation could require deep constitutional and electoral reforms. Furthermore, the most critical element of an effective fiscal rule is to limit the growth of the non-resource fiscal deficit to the size of foreign borrowing and withdrawals from a wealth fund—a fiscal rule against monetization. This requires political leaders to commit to limiting their own discretion by enforcing legislation that protects central bank independence.

# APPENDIX: A Sectoral Analysis

Conventional theory claims that resource-financed fiscal outlay raises the demand for non-tradable goods and increases the price of non-tradables relative to tradables, *ceteris paribus*. Therefore, resource rents induce a real exchange rate appreciation. This framework has several limitations. It assumes labor is the sole input and is fully employed, that markets are perfectly competitive, and that labor moves freely between sectors. However, imports play a significant role as inputs in both tradable and non-tradable production, and firms, particularly in the non-tradable sector, engage in mark-up pricing.

$$RER = \frac{w_{NT}}{w_T} \frac{a_T}{a_{NT}}$$

Conventional theory defines the real exchange rate as shown above, where the resource-movement and resource-spending effects raise the wage rate in the non-tradable sector ($w_{NT}$) relative to the tradable sector ($w_T$), thereby, appreciating the real exchange rate (RER). Relative labor productivities are denoted by $a_T/a_{NT}$. It is transparent that the impact of imports is omitted from this analysis.

If we relax the assumption of competitive markets and admit mark-up pricing in the non-tradable sector, then, the real exchange rate becomes:

$$RER = (\tau) \frac{w_{NT}}{w_T} \frac{a_T}{a_{NT}}$$

where the firm-level mark-up is given by $\tau$. We advance two hypotheses: (i) The mark-up decreases as competition within the import sector intensifies; and (ii) competition within the import sector increases with the volume of non-resource imports. The basic intuition is that an increase in non-resource imports, such as automobiles, increases price competition among car importers—even for a country that produces no cars—which reduces the weighted average mark-up. Consequently, although non-tradable prices may increase due to wage inflation from the expenditure of resource rents, they will also decline because of reduced mark-ups as non-resource imports expand, all else being equal. Consider another example. Housing stock cannot be imported, and real estate prices are partly determined by unit labor cost in the construction sector. However, housing construction requires imported steel and cement, and furnishing and design also require imported goods (e.g. microwaves, lighting, and television, etc). It follows that tradable prices and the degree of competition within the import sector will also determine the non-tradable price of housing stock.

Do capital goods imports impact the productivity ratio $a_T/a_{NT}$? Imported equipment, such as

electronic clippers, enables barbers to serve more clients per hour, chefs become more efficient with multi-functional stoves and ovens, and doctors improve their effectiveness with cutting-edge medical equipment and pharmaceuticals, often sourced from abroad. Also, the supply of labor in the non-tradable sector might expand due to international migrants and prevent a wage increase. The main point is that non-resource imports help counteract rising prices and real appreciation by reducing mark-ups and increasing labor productivity in the non-tradable sector.

Overall, this sectoral perspective is consistent with our macro model, where a real appreciation is driven by central bank money creation that increases wage costs in the non-tradable sector without a corresponding increase in non-resource imports, *ceteris paribus*.

# References

Addison, T. and Baliamoure-Lutz, M. (2017). Aid, the Real Exchange Rate and Why Policy Matters: The Cases of Morocco and Tunisia. *The Journal of Development Studies*, 53(7):1104–1121.

Adu, G. and Marbuah, G. (2011). Determinants of Inflation in Ghana: An Empirical Investigation. *South African Journal of Economics*, 79(3):251–269.

Aiyar, S. (2007a). Mozambique. In Berg, A., Aiyar, S., Hussain, M., Roache, S., Mirzoev, T., and Mahone, A., editors, *The Macroeconomics of Scaling Up Aid: Lessons from Recent Experience*. International Monetary Fund (IMF).

Aiyar, S. (2007b). Uganda. In Berg, A., Aiyar, S., Hussain, M., Roache, S., Mirzoev, T., and Mahone, A., editors, *The Macroeconomics of Scaling Up Aid: Lessons from Recent Experience*. International Monetary Fund (IMF).

Alssadek, M. and Benhin, J. (2021). Oil Boom, Exchange Rate and Sectoral Output: An Empirical Analysis of Dutch Disease in Oil-Rich Countries. *Resources Policy*, 74(5):102362.

Anwar, A, I. and Mang, C. F. (2022). Do Remittances cause Dutch Disease? A Meta-Analytic Review. *Applied Economics*, 54(3):4131–4153.

Banful, A. (2011). Do Formula-Based Intergovernmental Transfer Mechanisms Eliminate Politically Motivated Targeting? Evidence from Ghana. *Journal of Development Economics*, 96(2):380–390.

Bawumia, M. and Halland, H. (2018). Oil Discovery and Macroeconomic Management: The Recent Ghanaian Experience. In Addison, T. and Roe, A., editors, *Extractive Industries: The Management of Resources as a Driver of Sustainable Development*. Oxford: Oxford University Press.

Boamah, M. I. (2019). IInflation Dynamics in a Small Developing Economy: An Empirical Analysis for Ghana. *The Journal of Developing Areas*, 53(3):229–237.

BOG (2005). Bank of Guyana Annual Report. Bank of Guyana (BOG).

BOS (2024). Employment in the Public Sector: 2000 to 2018. Bureau of Statistics (BOS), Georgetown, Guyana, accessed: August 18, https://statisticsguyana.gov.gy/.

Cevik, S. and Zhu, T. (2020). Trinity Strikes Back: Monetary Independence and Inflation in the Caribbean. *Journal of International Development*, 32(3):375–388.

Coppin, A. (1994). The Determinants of International Reserves in Barbados: A Test of the Monetarist Approach. *Social and Economic Studies*, 43(2):75–89.

Corden, W. M. (1984). Booming Sector and Dutch Disease Economics: Survey and Consolidation. *Oxford Economic Papers*, 36(3):359–380.

Corden, W. M. and Neary, J. P. (1982). Booming Sector and De-Industrialization in A Small Open Economy. *The Economic Journal*, 92:825–848.

Cust, J., Devarajan, S., and Mandon, P. (2022). Dutch Disease and the Public Sector: How Natural Resources can undermine Competitiveness in Africa. *Journal of African Economies*, 31(1):i10–i32.

Edwards, D. (2021). Ethnogenesis, Ethnicization, and Ethnopolitics: Some Analytic, Theoretical, and Policy Insights from Guyana. *Social and Economic Studies*, 70(34):36–71.

GuyanaTimes (2023). Over 15,000 Persons Employed through Part-Time Jobs Initiative—Jagdeo. Daily News, Guyana Times, accessed: August 19, 2024, https://guyanatimesgy.com/.

Hausermann, H., Ferring, D., Atosona, B., Mentz, G., Amankwah, R., Chang, A., Hartfield, K., Effah, E., Yeboah, Asuamah, G. Y., Mansell, C., and Sastri, N. (2018). Land-Grabbing, Land-Use Transformation and Social Differentiation: Deconstructing "Small-Scale" in Ghana's recent Gold Rush. *World Development*, 108:103–114.

Hilson, G. and Laing, T. (2017). Guyana Gold: A Unique Resource Curse? . *The Journal of Development Studies*, 53(2):229–248.

Hussain, M. (2007). Tanzania. In Berg, A., Aiyar, S. andHussain, M., Roache, S., Mirzoev, T., and Mahone, A., editors, *The Macroeconomics of Scaling Up Aid: Lessons from Recent Experience,* . International Monetary Fund (IMF).

Hussain, M., Berg, A., and Aiyar, S. (2009). The Macroeconomic Management of Increased Aid: Policy Lessons from Recent Experience. *Review of Development Economics*, 13(3):491–509.

Isard, P., Lipschitz, L., Mourmouras, A., and Yontcheva, B. (2006). Foreign Aid and Macroeconomic Management: Overview and Synopsis of Key Lessons. In Isard, P., Lipschitz, L., Mourmouras, A., and Yontcheva, B., editors, *The Macroeconomic Management of Foreing Aid: Opportunities and Pitfalls*. International Monetary Fund (IMF).

Khemraj, T. (2021). Two Ethnic Security Dilemmas: A Political Economy Channel of the Natural Resource Curse. *Social and Economic Studies*, 70(34):5–35.

Khemraj, T. (2024). Macroeconomic Effects of a Government Overdraft on its Central Bank Account. Working Paper No. 1050, Levy Economics Institute of Bard College.

Laing, T. (2019). Small Man Goes where the Large Fears to Tread: Mining in Guyana: 1990—2018. *Resources Policy*, 63:101426.

Mohammed, A. S., Graham, E., and Dary, S. (2022). Rising Expectations and Dying Hopes: Local Perceptions of Oil and Gas Extraction in Ghana. *Energy Researh and Social Science*, 88:102529.

Mosley, P. and Chiripanhura, B. (2016). The African Political Business Cycle: Varieties of Experience. *The Journal of Development Studies*, 52(7):917–932.

Neary, J. P. (1985). Real and Monetary Aspects of the Dutch Disease. In JUngenfelt, K. and Hague, D., editors, *Structural Adjustment in Developed Open Economies*. Palgrave Macmillan.

NRF (2024). Natural Resource Fund Quarterly Report. April 1 to June 30, Bank of Guyana.

Ocran, M. (2007). A Modelling of Ghana's Inflation Experience: 1960-2003. *Studies in Economics and Econometrics*, 31(1):119–144.

Oilnow (2024). Oil Fund Withdrawal Rule Too Conservative, says Guyana VP. . January 19, accessed: August 12, https://oilnow.gy/.

Persson, T. and Tabellini, G. (2000). *Political Economy: Explaining Economic Policy*. Cambridge, MA: MIT Press.

PIAC (2023). Annual Report: On the Management and Use of Petroleum Revenues. Public Interest Accountability Committee. Accessed: August 14, 2024, https://www.piacghana.org.

Prati, A. and Tressel, T. (2006a). Aid Volatility and Dutch disease: Is there a Role for Macroeconomic Policies? . IMF Working Paper, WP/06/145, International Monetary Fund.

Prati, A. and Tressel, T. (2006b). What is the most Effective Monetary Policy for Aid-Receiving Countries? DESA Working Paper No. 12, Department of Economic and Social Affairs, United Nations.

Rajan, R. G. and Subramanian, A. (2011). Aid, Dutch Disease and Manufacturing Growth. *Journal of Development Economics*, 94(1):106–118.

Roemer, M. (1989). The Macroeconomics of Counterpart Funds Revisited. *World Development*, 17(6):795–807.

Ross, M. L. (1999). The Political Economy of the Resource Curse. *World Politics*, 51(2):297–322.

Sefa-Nyarko, C. (2021). Ethnicity in Electoral Politics in Ghana: Colonial Legacies and the Constitution as Determinats. *Critical Sociology*, 47(2):299–315.

Solomon, C. (2013). Inflation in a Small Open Economy: The Case of Guyana. *Transition*, 42(1):26–40.

StabroekNews (2024). Gov't Tables Bill for Huge Hike in Withdrawal of Oil Money. January 27, accessed Aug 10: https://www.stabroeknews.com/.

Valog, M. K., Duodu, E., Yusif, H., and Baidoo, S. T. (2023). Effect of Exchange Rate on Inflation in the Inflation Targeting Framework: Is the Threshold Level Relevant? *Research in Globalization*, 6:100119.