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On fiscal dominance in Malawi

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Abstract

Keynesian economics postulates that increased government spending can stimulate growth and national economic transformation under conditions of deficient aggregate demand. This theoretical position is contrary to the orthodox neoclassical view which prioritises austerity. By this mainstream view, if government spending persistently exceeds government revenue, the resultant deficit may compromise the monetary policy objective of price stability by creating a regime of fiscal dominance, hence triggering inflation. In this paper, these contrasting positions are empirically verified for the case of Malawi. Inflation is modelled as an autoregressive distributed lag process, and the two-stage least squares estimation method is employed alongside ordinary least squares estimation. The study finds no clear evidence to support the importance of fiscal deficits nor that of money growth in Malawi's inflation process. On the other hand, external effects on domestic prices persist regardless of whether they are captured using the exchange rate or trade openness, suggesting the need for pragmatic solutions to external imbalances. These results also suggest the need to revisit the roles that orthodox economic theory and the International Monetary Fund (IMF) place on demand-side monetary policy in addressing inflation in economies like that of Malawi.

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1. Introduction

Standard Keynesian theories suggest that increased government spending can stimulate economic activity under conditions of deficient aggregate demand, hence addressing short-term economic imbalances and driving growth. Accordingly, early Keynesian economists (e.g., Keynes, 1936; Lerner, 1943) argued that the government has a responsibility to actively manage the economy in order to achieve full employment, and a deficit budget is the means for doing so. This policy position is in contrast with the orthodox neoclassical argument that if government spending persistently exceeds the available revenue, the resultant deficit and financing obligations may compromise the monetary policy objective of price stability by creating a regime of fiscal dominance. In this regard, fiscal dominance denotes the inflationary effect of the government deficit and/or its financing. Woodford (1995; 2001) postulates that persistent fiscal deficits are inflationary regardless of how they are financed, and regardless of the structure of the economy. Judging from an extensive review of the literature (e.g., Lin and Chu, 2013; Bhattarai *et al*, 2014), the interaction between fiscal and monetary policies has long been an appealing theme among academics and policy-makers over which interest has been renewed since the last global financial crisis. However, the issue has not been previously investigated in Malawi, despite its central role in the country's economic management practices since the adoption of neoliberal policies in the 1980s.

The literature suggests that the empirical validity of the fiscal dominance proposition may depend on the state of development of a country's financial sector; the degree of central bank independence from fiscal authorities; the country's inflation pattern; and the operating exchange rate regime within a global system of historically unequal development (Obeng-Odoom, 2020a; Jalil *et al*, 2014; Resende, 2007; Catao & Terrones, 2005; Fischer *et al*, 2002; Woodford, 1995). Although monetary authorities trade in short-term debt instruments in domestic capital markets in order to influence economic conditions in both advanced and developing economies, differences across these economies arise from the manner in which fiscal deficits are financed. Deficit spending in Global North economies is characteristically financed through the issuance of long-term public debt in the form of government bonds. On the other hand, the governments of most economies in the Global South are usually unable to sell long-term debt because of the infancy of the domestic financial markets and the higher risk profiles associated with such economies (Carolevschi, 2018; Woodford, 1995). This distinction suggests that, if fiscal dominance is an

acceptable argument against expansionary fiscal policy, the interaction between fiscal and monetary policies in advanced economies may be limited by the fact that the two institutions tend to operate on different ends of the yield curve, while such interaction may be more pronounced in less developed economies, since their monetary and fiscal authorities tend to trade in the same short-term debt instruments. Recourse to external financing among most of the Global South countries may bring further complications through its effects on the exchange rate and trade, while less flexible exchange rates may exacerbate the degree of monetary policy subordination to fiscal policy. Moreover, where central bank independence is limited and where monetary authorities are the financial agents of the government, recourse to seigniorage may only be constrained by the degree of fiscal discipline. However, Keynesianism has long challenged the fiscal dominance argument (see, e.g., Domar, 1957) by counter-arguing that the problem of public debt is, in fact, one of slow economic growth, and its solution lies in even more government borrowing and investment.

The issue of government deficit spending has gained particular attention in recent times. First, Reinhart and Rogoff (2010, p573) assert that "whereas the link between growth and debt seems relatively weak at 'normal' debt levels, median growth rates for countries with public debt over roughly 90 percent of GDP are about one percent lower than otherwise; average (mean) growth rates are several percent lower". It is worth noting, however, that several studies (e.g., Herndon *et al*, 2014; Domac & Yucel, 2005; Loungani & Swagel, 2003; King & Plosser, 1985) show that strongly-held narratives of the effects of fiscal policy on inflation and economic growth have not always been confirmed in empirical analyses. For instance, Herndon *et al* (2014) establish that the foregoing conclusion reached by Reinhart and Rogoff is unduly influenced by the selective exclusion of some available data, the inappropriate weighting of summary statistics as well as coding errors, leading to serious miscalculations that inaccurately represent the relationship between public debt and GDP growth. More recently, extensive government spending around the world to salvage a potential economic recession in the light of the COVID-19 pandemic has drawn sharp divisions among economists (see Obeng-Odoom, 2020b). The issue of fiscal dominance, therefore, remains heated and unsettled. This controversy calls for a more careful and systematic empirical assessment.

Malawi's macroeconomic policy experience presents a meriting case study for interrogating the deficit-inflation controversy. The Malawi Government budget is almost always in deficit, even after accounting for significant amounts of

donor aid (World Bank, 2020). If the fiscal dominance argument holds, one may expect that the effects of fiscal policy on the price formation process are real and costly on the credibility of monetary policy in Malawi. It is on this basis that, much like the rest of Africa (Obeng-Odoom, 2013), Malawi has been subjected to various fiscal restraint programmes since the adoption of the structural adjustment programmes (SAPs) promoted by the International Monetary Fund (IMF) and the World Bank since 1981. This is the case despite that the validity of the underlying theoretical proposition has never been locally tested in any focused single-country analysis. Although Malawi has been included in some panel data studies (e.g., Lin and Chu, 2013), the resultant generalisations inherent in such an approach to macro-modelling tend to mask the specific attributes of individual countries. To the extent that hitherto documented single-country analyses of the inflationary process in Malawi (e.g., Wu, 2017; Mangani, 2016; 2012; Ngalawa & Viegi, 2011) do not include fiscal variables, the inflationary effect of fiscal deficits is merely dogmatically acknowledged.

This paper conducts tests of fiscal dominance in Malawi. It does so by estimating autoregressive distributed lag (ARDL) models of inflation on the fiscal deficit and its financing, after controlling for growth in agricultural output, growth in money supply, growth in real per capita income, exchange rate growth, trade openness and growth in world oil prices. The results do not show clear support for the monetarist view that fiscal deficits undermine economic stability.

The next section contextualises the study by summarising the key macroeconomic policy developments in Malawi, while Section 3 reviews the theoretical and empirical literature. The proposed methodologies are presented in Section 4. Section 5 presents the findings of the study, and Section 6 concludes the paper.

2. The policy context

Malawi's generally poor, inadequate, and aging infrastructure increases the demand for public spending and poses critical economic management challenges. This state of infrastructure also hinders private sector investment and growth, limits the government's capacity to raise revenues domestically, and necessitates both foreign and domestic financing to close a rather persistent fiscal gap. World Bank (2020) data show that the Malawi Government deficit position, net of donor grants, averaged 4.7 percent of GDP during 1970 - 2017, reaching a record high of 10.2 percent of GDP in 1981. Over 30 percent of the government budget is typically donor-funded (Mangani, 2016), and disruptions

in the flow of such funding instigate recourse to domestic borrowing and/or reductions in the delivery of the already inadequate public goods and services. Although reaching the completion point under the Heavily Indebted Poor Countries (HIPC) initiative of the IMF in 2006 led to a decline in the stock of foreign debt from about US$3 billion (roughly 108% of GDP) to less than US$0.5 billion, the foreign debt position has depicted a new upward trend in recent times, reaching US$2.1 billion (30% of GDP) by September 2018 (Reserve Bank of Malawi, 2018). In addition, the persistent budget deficits resulted in the accumulation of domestic debt equivalent to a further US$2.1 billion by that date. Most of the domestic debt is owed to a financial sector which is dominated by a few players, and the absence of long maturity government bonds implies an incomplete yield curve. Genuine questions, therefore, linger over long-term fiscal sustainability in Malawi.

The country's monetary and exchange rate policies up to the 1980s were characterised by direct controls of interest rates, credit, exchange rates and foreign exchange. However, as research has shown ((see Mangani, 2016), the controls were sequentially abandoned during 1989 – 1994 in favour of market-based instruments, in line with the aforesaid SAPs. Interest rates have remained upward sticky since the adoption of liberal policies, purportedly to dampen inflationary expectations against the background of the persistent fiscal deficits. The concern over fiscal dominance has become more relevant in recent years as the authorities' attention has shifted towards forward-looking monetary policy with the view to adopting an inflation targeting regime, in line with the IMF prescriptions. The absence of fiscal dominance is regarded as one of the necessary pre-conditions for inflation targeting.

Similarly, the exchange rate flotation of 1994 has turned out to be a policy experiment that is a challenge to sustain given the country's precarious foreign reserves position, vulnerability to external shocks, and limitations on central bank independence. This prevailing exchange rate regime, in turn, has led to marked experiences of official exchange rate fixing that erodes the already limited reserves (Mangani, 2016).

Locating Malawi's underdevelopment – and, arguably, that of the rest of sub-Saharan Africa – may require a departure from mainstream economics. A much wider and far more relevant development economics perspective is needed to take into account the country's peculiarities by pragmatically examining the nexus between ideas, materialism and history (Obeng-Odoom, 2018). Accomplishing such a task requires challenging conventional wisdom and stylised facts. This

is particularly so when one considers that development remains elusive almost four decades since the country's adoption of neoliberal policies.

3. The literature

3.1. The theory

The original Keynesian theory clearly presents the government's capital budget – as distinguished from its current budget – as a device for achieving full employment equilibrium, while a deficit budget is the means for correcting a disequilibrium if and when it occurs (Keynes, 1936). However, in the original work, Keynes does not support the eventual 'Keynesian' position of running a budget deficit during a deflationary gap and running a budget surplus during an inflationary gap. Rejecting this position formed the basis for harmonised post-war demand management policy recommendations among neoclassical and Keynesian economists of the time (Armstrong, 2019). Lerner's (1943) interpretation of Keynes' theory leads to the evolution of the 'functional finance' argument that the government's fiscal policy actions - including its taxing, spending, borrowing and loan repayment - should be undertaken with regard only to their effects on the economy and without undue regard for what is considered to be sound or unsound.

On this basis, the government has the responsibility to actively manage aggregate demand by changing the levels of its spending and taxation in order to achieve full employment (by keeping aggregate demand exactly equal to the attainable level of aggregate supply) as well as price stability (by ensuring that aggregate demand does not exceed aggregate supply). Lerner's central augments are, therefore, that there is nothing characteristically bad about government borrowing; that macroeconomic policies must reflect pragmatism rather than consistency with some traditional doctrine; and that excessive aversion to public debt may lead to bad policies (Armstrong, 2019). To the extent that inflation reflects a deficiency of output relative to demand, increased government borrowing may stabilise the economy by stimulating growth (Domar, 1957), hence the government may run a deficit budget to address inflation. Emphasis is, however, placed on the productive use of extra government resources through an increase in the capital budget rather than the current budget. In fact, the theory generally advocates for a current budget that is at least balanced.

In contrast to the standard Keynesian position, neoclassical economists place a constraint on government borrowing. Sargent and Wallace (1981) theorise that fiscal policy is of no consequence in the price formation process when the

monetary authority is independent, since such an authority sets its policy in advance of fiscal policy and dictates how much seigniorage may be raised. In such a monetary dominant regime, fiscal solvency is assured without invoking monetary policy, permitting the independent monetary authority to deliver on a price stability commitment. On the other hand, when the fiscal authority moves first and arbitrarily defines the path of the primary fiscal surplus, seigniorage is invoked in order to guarantee fiscal solvency. Since the path of the primary fiscal surplus is predetermined in the latter regime, 'tight' monetary policy will have a perverse inflationary effect. Blanchard (2004) asserts that the higher interest rates occasioned by monetary tightening today also increase interest payments on government debt, thereby requiring loose money in future to generate the necessary additional seigniorage. As rational agents anticipate the future increase in money creation, they tend to bid today's price level up, creating what Sargent and Wallace (1981) refer to as the 'unpleasant monetarist arithmetic'. Sims (2011) provides a theoretical framework for understanding the effects of fiscal uncertainties on monetary policy, and illustrates that fiscal variables have predictive power in system dynamic models, even if traditional monetary policy indicators are included. Using a rational expectations framework, Davig *et al* (2011) provide a further theoretical illustration that exceeding an optimal debt limit creates an inflationary effect.

A theoretical basis for distinguishing between active and passive monetary and fiscal policies has been provided by Leeper (1991; 2005). An authority is said to pursue active policy if it autonomously sets its policy without regard for the behaviour of current and future policy variables under the control of the passive authority. Woodford (1995, 2001) extends the theory developed by Leeper (1991) into a general exposition of the policy coordination nexus called the fiscal theory of the price level (FTPL). The FTPL challenges Friedman's popular dictum that 'inflation is always and everywhere a monetary phenomenon' by positing that the price level is influenced by the budgetary policies of fiscal authorities. The theory shows that, in the current period, t, there exists the following relationship involving the nominal value of debt (B), the aggregate price level (P), real GDP (y) and j-periods-ahead forecasts of the primary fiscal surplus expressed as a ratio of nominal GDP (s):

$$\frac{B_t}{P_t y_t} = \sum_{j=0}^{\infty} \left(\frac{1+\dot{y}}{1+r} \right)^{j+1} E_t s_{t+j+1} \tag{1}$$

In equation (1), E_t is the conditional expectations operator; $\dot{y}$ and r are, respectively, the real GDP growth rate and the real interest rate; while j is any

intertemporal date. Woodford (1995) describes fiscal policy as Ricardian if s increases endogenously in response to an increase in B for a given value of y, thereby satisfying equation (1) without affecting the monetary base or P. On the other hand, s is set exogenously regardless of B under a non-Ricardian regime, hence the price level must adjust to satisfy equation (1) for the given values of B, y and s. Given an increase in B, this adjustment is necessary to offset the risk of fiscal insolvency by deflating the nominal value of the government debt, and is achievable through the provision of seigniorage by the monetary authority. In other words, monetary dominance (the Ricardian regime) is a necessary condition for price stability, while fiscal dominance (the non-Ricardian regime) undermines such stability. Investigating the causal relationships between B and s provides a natural framework for tests of fiscal dominance (Bohn, 1998; Canzoneri *et al*, 2001; Bajo-Rubio *et al*, 2009).

Fiscal dominance reflects a weak-form FTPL, since the effect of fiscal policy on prices is still achieved through money creation, in line with the quantity theory of money. In a strong-form FTPL, fiscal policy is said to drive current and future inflation independently of monetary policy (Woodford, 1995, 1998, 2001; Sims, 1994; Cochrane, 1999). To illustrate, the intertemporal equilibrium condition for the price level determination process under a bond price-support regime may be specified as follows:

$$\frac{B_t}{P_t} = \sum_{j=0}^{\infty} \beta^j E_t \frac{\lambda\left(y_{t+j}, i_{t+j}\right)}{\lambda(y_t, i_t)} \left[s_{t+j} + \frac{i_{t+j}}{1+i_{t+j}} L\left(y_{t+j}, i_{t+j}\right) \right] \tag{2}$$

where B, E_t, j, P, s, t, and y assume the same definitions as in equation (1) above, β^j is the intertemporal discount factor, while i is the nominal interest rate on government debt. L is the liquidity preference function, which increases with y and decreases with i. The representative consumer's utility function is given by $U_c(y,L(y,i) = \lambda(y,i)$. All the right hand side terms are functions of exogenous variables. If the fiscal expectations represented by the process $\{s_t\}$ are such that the right-hand side has a finite positive value, then B_t becomes a predetermined quantity at date t. Thus, setting $B_t > 0$, there is a unique equilibrium price level, $P_t > 0$, that satisfies equation (2). Importantly, news that reduces the current conditional expectation of current and/or future values of s results in a lower positive value for the right-hand side of equation (2), *ceteris paribus*. Therefore, since B_t is predetermined, P_t must rise. This fiscal effect on price is attained without the existence of a mechanical connection between fiscal policy and the monetary base. However, Carstrom and Fuerst (2000) note that fulfilling the strong-form FTPL presents serious empirical problems because it requires

three very large elasticities: a large interest elasticity of money demand; a large response of output to a decline in real balances; and a large response of the real interest rate to a decline in current output.

The increasingly stern criticism against deficit-budgeting by orthodox economists is considered dangerous and damaging by its heterodox critics who perceive it as a worrisome limitation on the government's ability to pursue public purpose (Armstrong, 2019). In this regard, heterodox economists had hoped that the resurgence of interest in the work of Keynes among policy-makers following the last global financial crisis (Skidelsy, 2010) would eventually catalyse an end to the neoclassical domination. Active fiscal policy – hence a surge in government deficits and debt levels – were pivotal in resolving the crisis. To the frustration of the heterodox economists, however, the neoclassical counterattack seems to have succeeded in attributing the crisis to government failure (Dymski, 2013).

3.2. The evidence

The evidence on the role of fiscal policy in the price determination process remains inconclusive, economy-specific, time-variant and generally weak. For instance, some early lack of support for fiscal dominance in developed economies abounds (see Dwyer, 1982; King & Plosser, 1985; Giannaros & Kolluri, 1986; Barnhart & Darrat, 1988; Karras, 1994), and a declining fiscal dominance trend is noted for Italy by Fratianni and Spinelli (2001). On the other hand, Bajo-Rubio *et al* (2014) provide evidence of fiscal dominance in Spain, while Traum and Yang (2011) provide support for an active monetary policy regime in the United States of America. Moreover, Kumhof *et al* (2010) show that the welfare gain from responding to fiscal variables is minimal compared to the gain from eliminating fiscal dominance, and that inflation tends to be more volatile under fiscal dominance than otherwise. Relatively more recent evidence in support of the fiscal dominance hypothesis is in Bhattarai (2014).

The evidence from Africa, and the Global South more generally, is equally inconclusive. Metin (1998) reveals that deficits are inflationary in Turkey, while Ersel and Ozatay (2008) also find that a high level of public debt limited the effectiveness of monetary policy in that same country. However, De Haan and Zelhorst (1990) find no evidence of fiscal dominance in seventeen Global South, while Komulainen and Pirttilä (2002) find that deficits do not play an inflationary role in Russia, Bulgaria and Romania. Considerable evidence has been recorded for Brazil, and includes support for both monetary dominance

(Canzoneri *et al*, 2001; Rocha & da Silva, 2004; Fialho & Portugal, 2005) and fiscal dominance (Blanchard, 2004; Moreira *et al*, 2007). Tanner and Ramos (2002) document Brazilian period-specific evidence of monetary dominance, while Loyo (1999) shows support for the FTPL in that country. Jalil *et al* (2014) find that the fiscal sector is dominant in explaining the price level in Pakistan, in keeping with the earlier evidence by Agha and Khan (2006), but Javid *et al* (2008) dispute this assertion.

Some studies also suggest that fiscal dominance is more prevalent in the economies of the Global South that have limited central bank independence than in developed economies (see, e.g., Resende & Rebei, 2008; Resende, 2007). Fischer *et al* (2002) and Lin and Chu (2013) find that the relationship between fiscal deficits and inflation is stronger in high-inflation than in low-inflation countries, but other studies (e.g., Metin, 1998; Loungani & Swagel, 2003; Domac & Yucel, 2005) dispute the link between a country's state of development and fiscal dominance. The results in Carolevschi (2018) suggest that, after accounting for a country's choice of exchange rate regime, fiscal dominance does not play a role in the monetary policy stance of some 142 countries from the Global South.

Within Sub-Saharan Africa (SSA), Makoto and Ndedzu (2012), Misati *et al* (2012), Ezeoha and Uche (2006) as well as Kilindo (1997) confirm the prevalence of the fiscal effect on price in Zimbabwe, Kenya, Nigeria and Tanzania, respectively, but Ezeabasili *et al* (2012) are unable to validate the Nigerian evidence. Baldini and Ribeiro (2008) document the mixed evidence that some SSA countries have chronically fiscally dominant regimes, some have monetary dominant regimes, while others show none of these two possible cases. Using data from the Democratic Republic of the Congo (DRC), Nachega (2005) also posits a strong relationship between budget deficits and seigniorage, as well as between money creation and inflation. Similar evidence is provided for Nigeria by Chimobi and Igwe (2010). In general, the SSA studies tend to support the fiscal dominance thesis.

Although concern for fiscal dominance is central to the formulation of monetary policy in Malawi, known studies on the Malawian inflationary process (see Wu, 2017; Mangani, 2012; Ngalawa and Viegi, 2011) have hitherto not included fiscal variables. This study seeks to update the policy discourse in Malawi by filling the evidence gap.

4. Methodology

4.1. Modelling framework

Lin and Chu (2013) use a dynamic panel quantile regression to examine the deficit-inflation relationship in 91 countries. The current study adapts their procedure into a single-country analysis using annual data, in order to examine country-specific effects that are typically masked in panel data analyses. The underlying inflationary process is assumed to be an autoregressive distributed lag (ARDL) specification of order 1, q, denoted:

$$INFL_t = \alpha_0 + \alpha_1 INFL_{t-1} + \sum_{j=0}^{q} \beta_j x'_{t-j} + \mu_t, \qquad \forall t = 1, 2, ..., T, \tag{3}$$

where $INFL_t$ represents the annual inflation rate in the current year, t; $INFL_{t-1}$ is the first-order autoregressive term; x'_{t-j} is a vector of contemporaneous and lagged exogenous variables impacting on current inflation, which includes a measure of the fiscal stance; μ_t is an uncorrelated error term; while α_0, α_1, and β_j are intercept and slope parameters to be estimated. In order to address endogeneity upon its detection, we apply the two-stage least squares (TSLS) estimation technique, using $\Delta INFL_{t-1}$ as an instrument for $INFL_{t-1}$. Note that Δ is the first difference operator. Accordingly, the Durbin-Wu-Hausman (DWH) test (see Hausman, 1978) is applied to resolve the endogeneity hypothesis.

Although most studies measure the fiscal stance only in terms of the central government deficit (primary or otherwise), the literature, as reviewed, suggests that how such deficits are financed may also matter. Therefore, we apply two measures of the fiscal stance, namely the fiscal deficit itself and net domestic credit to the public sector. The two measures are entered interchangeably in the estimation of equation (3). The following additional control variables included in vector x' are adopted from Lin and Chu (2013) and/or from the standard quantity theory of money: money growth, GDP per capita growth, exchange rate growth and oil price inflation. Recognising the significant role of agricultural output – hence food prices – in Malawi's inflationary process (see Deraniyagala & Kaluwa, 2011), growth in agricultural output is also added in vector x'. Subsequently, trade openness is used in place of exchange rate growth as a robustness check on the potency of external influences in the domestic price formation process, alongside oil price inflation. Guided by a common practice in the literature (see Karras, 1994; Catao & Terrones, 2005; Lin & Chu, 2013), we experiment with both $q = 2$ and $q = 3$, seeking a parsimonious specification that accounts for serial correlation.

4.2 The data

The underlying data on the variables are sourced from the Reserve Bank of Malawi (RBM), the National Statistical Office (NSO) of Malawi and the World Bank, as elucidated in Table 1. They are annual data for the period 1970 - 2016 after adjusting end-points, giving a total of 47 usable observations. Inflation is calculated as 100 times the logarithmic first difference of the annual consumer price index, and the data are spliced by applying inherent adjustors to account for rebasing. The fiscal deficit (denoted *DEF* in the ensuing analysis) is calculated by subtracting the sum of government revenue and grants from total government expenditure. Net domestic credit to the public sector (*CREDIT*) is the sum of net domestic credit to the central government and net domestic credit to statutory corporations or state-owned enterprises. The data are for credit from the RBM and from commercial banks; they exclude credit from other financial institutions which generally account for a very insignificant proportion of total credit to the public sector, and for which complete data are unavailable. The nominal values of *DEF* and *CREDIT* are all expressed as percentages of nominal GDP.

Money growth (*M1G)* is the annual percentage change in narrow money (i.e., the sum of currency in circulation outside banks and private demand deposits held by commercial banks), while GDP per capita growth (*GDPPC*) is the annual percentage change in GDP per capita, based on constant local currency. Openness (*OPEN*) is computed as the sum of the nominal values of imports and exports of goods and services, also expressed as a percentage of nominal GDP. Oil price inflation (*OILP*) is calculated as 100 times the logarithmic first difference of world oil prices, expressed in local currency, while exchange rate growth (*EXRATE*) is the annual percentage change in the units of domestic currency per unit of the United States dollar. Agricultural output growth (*AGRIC*) is the annual percentage change in value-added from agriculture, forestry and fishing, which is practically dominated by the production of maize and other cereals.

Table 1 also provides some basic summary statistics for the data. Inflation averaged 17.9 percent during the study period, locating Malawi as a generally high inflation economy. The annual flow of domestic credit to the public sector averaged 8.3 percent of GDP, compared with the average fiscal deficit of 4.6 percent of GDP. This outturn arises from the fact that the flow of domestic borrowing saves two purposes, namely part-financing of the current budget deficit and rolling-over of maturing domestic debt. The scarcity of fiscal surpluses implies an ever-rising stock of domestic (and foreign) debt, but complete data on the domestic debt stock is unavailable. Money growth

has been steady, averaging 24 percent per annum, and a comparable trend is associated with oil price inflation. Exchange rate management challenges are also evident: although currency depreciation averaged 4.3 percent per annum, over-valuations and severe depreciations are evident in the minimum and maximum values of the exchange rate growth variable (-8.10% and 24.6%, respectively). Moreover, Malawi is a small open economy that is heavily reliant on imports, hence average trade openness exceeds 60 percent of GDP. It is also noteworthy that the performance of the agricultural sector has not been above board. The wide variability in the sector's performance from a maximum growth of almost 53 percent witnessed in 1993 to a contraction of almost 29 percent a year later depicts the sector's (and the entire economy's) precarious dependence on weather and climatic conditions. As a result, the sector has only grown by a pitiable 4 percent on average, and the resultant low output over many years has exerted pressure on domestic prices. There are no other particularly annoying outliers in the dataset.

Table 1: Data Sources and Summary Statistics

Variable	Data Source	Mean	Median	Max	Min	S.D.
AGRIC	WDI	4.01	3.31	52.98	-28.92	12.77
CREDIT	RBM	8.31	6.99	24.27	-1.26	6.41
DEF	RBM	4.61	4.82	10.54	-1.93	3.00
EXRATE	RBM	4.83	3.10	24.55	-8.10	6.33
GDPPC	WB1	1.09	1.27	15.41	-10.62	4.95
INFL	NSO	17.93	13.50	83.33	0.82	13.58
M1G	RBM	23.71	24.57	63.35	-9.58	17.36
OILP	WB2	21.87	17.42	138.98	-55.98	33.32
OPEN	WB1	60.91	58.93	91.38	41.90	9.94

Data sources: NSO = National Statistical Office; RBM = Reserve Bank of Malawi's Financial and Economic Reviews; WB1 = World Bank's World Development Indicators; retrieved March 20, 2020, from https://data.worldbank.org/country/malawi; WB2 = World Bank's Commodity Price Data, retrieved November 20, 2017 from http://pubdocs.worldbank.org/en/561011486076393416/CMO-Historical-Data-Monthly.xlsx.

Notes: Max = maximum; Min = minimum; S.D. = standard deviation.

4.3. Model determination

Table 2 reports some unit root test results. Four tests are applied, namely the standard augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests, the ERS Dickey-Fuller test with generalised least squares de-trending (see Elliot *et al*, 1996), and the KPSS test of Kwiatkowski *et al* (1992). The ADF and ERS tests use an automatic lag length selection procedure for the autoregressive structure, based on the Schwarz information criterion for a maximum possible lag of 6. Automatic bandwidth selection based on the Newey-West method is applied in the PP and KPSS tests for which we also use the Bartlett kernel spectral estimation method. A graphical inspection of each of the series suggests the inclusion of trend and intercept terms in the tests for *DEF* (which appears to display a downward trend), and of only intercept terms in the tests for the rest of the variables. The graphical inspection also supports the supposition that structural breaks would not affect the variables, since the data are expressed either in terms of growth rates or as percentages of GDP. The critical values (presented in parentheses) are for the 5 percent significance level at which the test results are evaluated. In all the tests but KPSS, test statistics greater than the corresponding critical values in absolute value terms establish stationarity; the converse holds for the KPSS test. All the tests – as well as all the estimation results reported in this paper – are conducted using the EViews 8 software.

As shown in Table 2, *AGRIC*, *DEF*, *EXRATE*, *GDPPC*, *INFL*, *OILP* and *OPEN* are clearly I(0) variables. *DEF* is, in fact, trend-stationary. We also consider *M1G* to be stationary on the basis that the presence of a unit root can be rejected in three of the four tests conducted. On the other hand, non-stationarity in the level variable may not be rejected for *CREDIT*. Further inspection applying similar procedures - the results of which are not displayed to conserve space, but are available on request alongside the said graphs of the series - reveals that *CREDIT* is, in fact, an I(1) process. Hence, it is denoted $\Delta CREDIT$ in the ensuing analysis.

Table 2: Results of Unit Root Tests in the Levels of the Variables

Variable	Test Statistics			
	ADF Test (CV1 = -2.928) (CV2 = -3.511)	**ERS Test (CV1 = -1.948) (CV2 = -3.190)**	**PP Test (CV1 = -2.927) (CV2 = -3.511)**	**KPSS Test (CV1 = 0.463) (CV2 = 0.146)**
AGRIC	-11.188+	-10.409+	-10.601+	0.085+
CREDIT	-2.581	-1.751	-2.354	0.108+
DEF	-5.786*	-5.740*	-6.117*	0.043*
EXRATE	-3.722*	-3.349*	-3.788*	0.157*
GDPPC	-7.467+	-6.857+	-7.429+	0.104+
INFL	-3.795+	-3.626+	-3.700+	0.229+
M1G	-5.836+	-5.655+	-5.812+	0.563
OILP	-6.585+	-5.950+	-6.590+	0.086+
OPEN	-4.299+	-4.227+	-4.268+	0.097+

Notes: CV1 is the 5% critical value for the test with an intercept term only; CV2 is the 5% critical value for the test with trend and intercept terms. Changes in critical values due to automatically selected autoregressive lag lengths or bandwidths are insignificant.* indicates that the series is a trend-stationary process, while + indicates that the series is an I(0) process without a trend.

In view of the trend-stationarity of *DEF*, the deficit data are de-trended using:

$$DEF_t = \delta_0 + \delta_1 Trend_t + \upsilon_t, \quad (4)$$

where $Trend_t$ is the value of the trend line in year *t*, and from which the fitted values of υ_t are the de-trended deficit series which are used in the estimations.

The foregoing discussion leads to the estimation of four separate inflation models. These vary according to the measure of the fiscal stance incorporated in the ARDL process – a choice between fiscal deficits and domestic borrowing – and whether the external effects on inflation are captured using the exchange rate or trade openness. The distributed lag variable permutations describing the four models as well as the DWH endogeneity test results with $q = 2$ are summarised in Table 3. The test results show that $INFL_{t-1}$ is endogenous (hence TSLS estimation is preferred to OLS estimation) in the first two models, while OLS estimation is preferred in Models 3 and 4.

Table 3: Distributed LAG Variable Permutations in the Inflation Models and Durbin-Wu-Hausman Test Results

Model	Distributed Lag Variables	DWH Test Results	
		DWH	(p)
1	*DEF, AGRIC, EXRATE, GDPPC, M1G, OILP*	3.844	(0.049)**
2	*ΔCREDIT, AGRIC, EXRATE, GDPPC, M1G, OILP*	4.231	(0.040)**
3	*DEF, AGRIC, GDPPC, M1G, OILP, OPEN,*	0.156	(0.693) +
4	*ΔCREDIT, AGRIC, GDPPC, M1G, OILP, OPEN*	0.588	(0.443) +

Notes: DWH is the test statistic under the null hypothesis that both TSLS and OLS estimators are consistent, but that the OLS estimator is efficient. The alternative hypothesis is that only the TSLS estimator is consistent. *p*, in parentheses, is the probability of accepting the null hypothesis. ** indicates that TSLS estimation is preferred to OLS estimation at the 5% significance level, while + indicates that OLS estimation is conversely preferred.

Table 4: Breusch-Godfrey Serial Correlation Test Results

Panel A: $q = 2$				
Inflation Model	**AR(1)**		**AR(2)**	
	χ^2	*(p)*	χ^2	*(p)*
Model 1	0.576	(0.448)	3.162	(0.109)
Model 2	0.285	(0.594)	2.073	(0.126)
Model 3	0.182	(0.670)	9.067	(0.011)**
Model 4	5.720	(0.017)**	9.806	(0.007)***
Panel B: $q = 3$				
Inflation Model	**AR(1)**		**AR(2)**	
	χ^2	*(p)*	χ^2	*(p)*
Model 1	0.024	(0.878)	14.468	(0.001)***
Model 2	1.078	(0.299)	7.057	(0.029)**
Model 3	1.461	(0.227)	4.486	(0.106)
Model 4	2.222	(0.136)	4.237	(0.110)

Notes: q is the distributed-lag structure; χ^2 is the Langrage-multiplier test statistic; while *p*, in parentheses, is the probability of accepting the hypothesis of no serial correlation; *** and ** indicate the presence of serial correlation at the 1% and 5% significance levels, respectively.

Table 4 shows the results of the Breusch-Godfrey test for up to second order serial correlation in the estimations of equation (3), setting $q = 2$ (Panel A) and $q = 3$ (Panel B). As determined in the foregoing, Models 1 and 2 are estimated using the TSLS method with $\Delta INFL_{t-1}$ as an instrument for $INFL_{t-1}$, while Models 3 and 4 are estimated using the OLS technique. The results suggest that Models 1 and 2 are ARDL(1,2) processes, since the inclusion of the third distributed lags worsens the prevalence of serial correlation. In the same spirit, Models 3 and

4 are clearly ARDL(1,3) processes, since the addition of the third distributed lags addresses the problem of serial correlation prevalent when ARDL(1,2) processes are considered.

5. Estimation results

Table 5 presents the estimation results. For the intercept term and the $INFL_{t-1}$ variable, the entries are individual parameter estimates with their corresponding *p*-values for accepting the null hypothesis of statistical insignificance in parentheses. For the rest of the variables, the entries are χ^2-distributed Wald test statistics under the null hypothesis that all the coefficients for the corresponding group of variables are jointly statistically insignificant, and the accompanying figures in parentheses are also the *p*-values for accepting this null hypothesis. Note that coefficients of determination are only reported for the last two models because this metric is technically meaningless in TSLS estimation. By this metric, the applicable models fit the data quite well, explaining 75 to 76 percent of the variability in inflation.

Table 5: Estimation Results

	Model 1	**Model 2**	**Model 3**	**Model 3**
Intercept	-4.312 (0.404)	-1.676 (0.741)	-18.856 (0.294)	-16.165 (0.339)
$INFL_{t-1}$	1.066 (0.033)**	1.064 (0.012)**	0.287 (0.202)	0504 (0.039)**
ΣDEF_{t-j}	3.967 (0.265)		7.113 (0.130)	
$\Sigma\Delta(CREDIT)_{t-j}$		3.150 (0.369)		8.587 (0.072)
$\Sigma AGRIC_{t-j}$	6.215 (0.102)	6.375 (0.095)*	4.466 (0.247)	6.871 (0.148)
$\Sigma EXRATE_{t-j}$	11.797 (0.008)***	8.338 (0.040)**		
$\Sigma GDPPC_{t-j}$	1.806 (0.614)	2.779 (0.427)	7.225 (0.125)	7.108 (0.130)
$\Sigma M1G_{t-j}$	3.834 (0.280)	1.783 (0.619)	10.438 (0.034)**	7.888 (0.096)***
$\Sigma OILP_{t-j}$	1.537 (0.674)	2.042 (0.564)	3.801 (0.434)	3.176 (0.529)
$\Sigma OPEN_{t-j}$			41.214 (0.000)***	43.570 (0.000)***
R^2			0.748	0.762

Notes: For the intercept and $INFL_{t-1}$ variables, the entries are individual parameter estimates. For the rest of the variables, the entries are χ^2-distributed Wald test statistics. Figures in parentheses are the corresponding p-values. ***, ** and * denote statistical significance at 1%, 5% and at 10%, respectively. R^2 is the adjusted coefficient of determination.

The estimation results show that the effects of the fiscal stance on inflation are supported by the data in only one of the four models and, this support occurs at the less stringent significance level of ten percent. This finding persuades the conclusion that fiscal deficits and domestic financing are generally not inflationary in Malawi. Therefore, neither the established neoliberal theory nor most of the evidence provided for sub-Saharan African countries (e.g., Makoto and Ndedzu, 2012; Misati *et al*, 2012; Resende, 2007; Ezeoha and Uche, 2006; Kilindo, 1997; Nachega, 2005) are supported. The result also challenges the emphasis on fiscal discipline propounded in a study on Malawi by Wu (2017).

A somewhat ambiguous finding relates to the inflationary effect of money growth, which occurs only when trade openness replaces the exchange rate but not otherwise. This finding opens up debate on the correct specification of the inflation model for the purpose of interrogating the quantity theory of money. In turn, the dominant practice of mopping up excess liquidity by the RBM to dampen inflation may neither be undoubtedly supported nor be plainly disputed. Moreover, even when money growth fuels inflation, the extent to which excess liquidity arises from the fiscal stance deserves further interrogation.

An unequivocal result of this analysis, which is consistent with the findings documented by Mangani (2012) as well as Ngalawa and Viegi (2011), is the worth of imported inflation in Malawi: regardless of whether external sector effects on inflation are measured by the exchange rate or by trade openness, these effects tend to be the strongest (in statistical significance terms) and most persistent across all the models. Given the tenacity of the trade deficit in Malawi, and considering that the individual coefficients for both *EXRATE* and *OPEN* – which are also available on request – are dominantly positive, this result confirms the worth of exchange rate and trade policies in the country's macroeconomic management. The positive *EXRATE* coefficients particularly reveal that domestic currency depreciation is quite inflationary.

The other most important effect on current inflation arises from previous inflation, since the autoregressive coefficient is significantly positive in three of the four models. Thus, there is a significant measure of short memory in the inflation process: current inflation is quite dependent on the previous year's inflation, most prominently in the TSLS estimations. The first order autoregressive process may, therefore, be useful in Malawi's inflation forecasting.

Last but not least, Table 5 also shows that the rate of growth in GDP per capita and international oil prices are immaterial control variables in the inflation models. The irrelevance of *GDPPC* thwarts arguments for the prevalence of

demand-pull inflation, and challenges the quantity theorists further. Moreover, the fact that international oil price changes have no association with domestic prices is unsurprising, because the pass-through of these changes is regulated by the authorities via an institutionalised petroleum pricing mechanism. Additionally, growth in agricultural output is only scantily significant in Model 2, but otherwise uninfluential. This finding occurs as a surprise that also begs further interrogation.

6. Conclusion

The debate about fiscal dominance has been rekindled in recent times, but the terms have remained similar. While Keynesians have supported the theoretical and empirical soundness of deficit financing, orthodox neoclassical economists have denounced it. Economic management in Malawi is dominantly influenced by the latter, buoyed by the IMF's neoliberal policy prescriptions which characteristically constrain fiscal deficits and domestic financing in order to control inflation. Because the application of these prescriptions over a period of almost four decades has not succeeded to address the country's development challenges, it appears imperative to interrogate them critically.

The empirical analysis reported in his paper shows that fiscal deficits and domestic financing are generally not inflationary in Malawi, contrary to the established neoliberal theory and the evidence provided for some sub-Saharan African countries. In addition, the inflationary effect of money growth is ambiguous, as it occurs only when trade openness replaces the exchange rate but not otherwise. As such, the dominant practice of mopping up excess liquidity by the central bank to dampen inflation may neither be undoubtedly supported nor be plainly disputed. While the fiscal dominance argument may be disputed, subsequent research should interrogate further the quantity theory arguments that are the cornerstone of IMF advice to Malawi.

A clearly unequivocal result of this analysis is the importance of imported inflation. Regardless of whether external sector effects are measured by the exchange rate or by trade openness, these effects tend to be the most inflationary across all the models. This result confirms the significance of exchange rate and trade policies in Malawi's macroeconomic management.

Based on these results, it appears necessary to reconsider the roles that orthodox economic theory and the IMF place on demand-side monetary policy in addressing inflation in economies like that of Malawi. While the impact of fiscal operations on inflation hardly exists, therefore, Malawi's weak export

base, inelastic demand for imports, and excessive dependence on heavily volatile donor aid to bolster foreign exchange reserves are factors for which policy-makers must find pragmatic solutions in order to attain durable macroeconomic stability. Addressing these factors could be more rewarding in the conduct of monetary policy than the pursuit of contractionary fiscal policy nor an excessive preoccupation with mopping up liquidity from the system to contain money growth, which is usually accomplished through high interest rates.

Future research may examine how the composition of government spending could affect these results, in view of the Keynesian proposition that the government may be allowed to run a capital budget deficit provided that its current budget is at least balanced.

Biographical note

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