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## **Aggregate Demand Policy in Mature and Dual Economies**

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# Aggregate demand policy in mature and dual economies\*

Peter Skott<sup>†</sup>

September 18, 2019

## Abstract

Aggregate demand is important, both in the short and the long run, but a basic distinction must be made between dual and mature economies. Mature economies may suffer from a structural aggregate problem ('secular stagnation'): full-employment growth may be impossible in the absence of sustained fiscal stimulus. Dual economies with high levels of open or hidden unemployment, by contrast, do not face long-run structural aggregate demand problems. They require public investment in key areas, including education and infrastructure, but the key problems concern the composition of demand and the need to expand the modern sector. These economies face structural transformation problems.

## 1 Introduction

The possibility of 'secular stagnation' in the US and other advanced economies gained renewed attention during the 'great recession'. Emerging economies have also experienced problems recently. Many Latin American countries have seen a reversal of fortunes, and China may face the prospect of slower economic growth. The analysis of these long-run growth issues must, I shall argue, consider the supply side as well as aggregate demand. Supply and demand factors interact, and policy recommendations that make sense for advanced economies may cause great harm if applied to emerging economies.

Aggregate demand policy is important, both in the short and the long run. There is a basic distinction, however, between labor-constrained mature

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economies and capital-constrained dual economies. Mature economies may suffer from a structural aggregate problem (secular stagnation): full-employment growth may be impossible in the absence of sustained fiscal stimulus. Dual economies with high levels of open or hidden unemployment, by contrast, do not face long-run structural aggregate demand problems. They require public investment in key areas, including education and infrastructure, but the key problems concern the composition of demand and the need to expand the modern sector. These economies face structural transformation problems.

Section 2 outlines a simple one-sector framework for analyzing steady growth. Section 3 discusses the application of the framework to mature economies. The challenges and policy priorities in dual economies are analyzed in section 4. Section 5 offers a few concluding remarks.

## 2 Goods market equilibrium and the warranted growth rate

In line with most post-Keynesian growth models, I assume a Leontief production function

$$Y = \min\{\sigma K, \lambda L\}$$

The fixed coefficients may be the *ex-post* reflection of a choice of technique. The choice of technique could be determined by the rate of interest (the cost of finance) which in turn could be set by policy makers. The maximization of consumption per efficiency unit of labor in a Solow model with perfect competition, for instance, requires that the capital intensity be consistent with the 'golden rule': the rate of return on capital must be equal to the rate of growth.

The golden rule and the assumptions behind the Solow model may not be appealing, but the existence of a policy target for the interest rate does not depend on a neoclassical production function with smooth substitution. The set of available techniques can be specified more generally, and the existence of a choice of technique is consistent with the insights from the Cambridge capital controversy, including reswitching and capital reversing. Indeed, the choice-of-technique argument is in line with Sraffa's (1960, p. 33) suggestion that the rate of profits "can well be determined from outside the system of production, in particular by the level of the money rate of interest". More importantly for the purposes of this paper, a policy-determined real rate of interest (and an associated choice of technique) is consistent with Lerner's principle of functional finance (cf. footnote 7 below).

My concern in this paper is with long-run growth and, disregarding short-run lags, I take consumption to be a linearly homogeneous function of disposable income and wealth.<sup>1</sup> With this assumption, the goods market equilibrium condition for a closed economy can be written

$$Y = C(Y - T, W) + I + G \tag{1}$$

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<sup>1</sup>The specification has empirical support; e.g. Hendry and Muellbauer (2018).

$Y, C, I$  and  $G$  denote output, consumption, investment and government spending on goods and services.  $T$  is taxes net of transfers, where transfers include interest payments on the public debt;  $W$  is private sector wealth.

Dividing through by  $Y$  we have

$$\begin{aligned} 1 &= \frac{C(Y^D, W)}{Y} + \frac{I}{K} \frac{K}{Y} + \frac{G}{Y} \\ &= f(t, w) + (g + \delta) \frac{K}{Y} + \gamma; \quad f_t < 0, f_w > 0 \end{aligned} \quad (2)$$

where  $g, \delta, \gamma, t$  and  $w$  denote the growth rate, the rate of depreciation, the share of government spending in output ( $G/Y$ ), the share of taxes net of transfers ( $T/Y$ ), and the ratio of private wealth to income ( $W/Y$ ). For simplicity, I take private wealth to be the sum of fixed capital and government debt, that is,<sup>2</sup>

$$w = \frac{K + B}{Y}$$

By assumption the choice of technique – the technically determined maximum output-capital ratio  $\sigma$  – is given. The actual output capital ratio is determined by the choice of technique and the utilization rate of capital,  $u$ . I shall assume that in steady growth the utilization rate will be at the desired level,  $u = u^d$ . This desired level will be determined by structural characteristics and may change as the result of changes in, for instance, the degree of product market competition or the volatility of firm-level demand. For present purposes, however, there is no harm in taking the desired rate of utilization as constant.<sup>3</sup> With these assumptions, the capital-output ratio in steady growth is given,  $K/Y = (\sigma u^d)^{-1} = \nu$ , and equation (2) describes a tradeoff between the rate of accumulation  $g$  and the share of private plus public consumption in income ( $f(t, w) + \gamma$ ).

The tradeoff corresponds to the well-known consumption-growth frontier in classical economics. But the interpretation of the tradeoff is Harrodian: equation (2) defines a warranted rate of growth,  $g$ . This warranted growth rate need not be equal to the natural growth rate (the growth rate of the labor supply in efficiency units, taking into account labor saving technical change). The warranted growth path, second, is likely to be unstable: the economy does not automatically converge to the warranted path.

The implications of the general framework in this section depends on the supply side, and I consider two stylized cases: mature economies and dual economies.

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<sup>2</sup>In a corporate economy household wealth takes the form of financial assets, including equity and corporate bonds, rather than direct ownership of fixed capital. The analysis is extended in this direction by Ryoo and Skott (2013).

<sup>3</sup>This Harrodian assumption differs from Kaleckian specifications. Amit Bhaduri's work with Steve Marglin has been foundational for the Kaleckian literature on growth and distribution (Bhaduri and Marglin 1990, Marglin and Bhaduri 1990). I have found Bhaduri's contributions on this and other issues to be consistently inspiring and thought provoking, even if at times I have taken different positions.

### 3 Mature economies

The capital stock is large relative to the labor supply in a mature economy, and long-run economic growth is constrained by the growth rate of the labor supply in efficiency units.

To avoid misunderstanding it should be stressed, first, that a mature economy need not have 'full employment'. An economy is mature if fast growth rates of aggregate demand would create labor constraints within a relatively short period. The USA, Japan and most west European countries are mature in this sense: Chinese style growth rates of 10 percent a year would lead to overheating and labor shortages within a few years. Thus, an economy with 5, 10 or 15 percent unemployment can be mature, even taking into account discouraged workers and the limitations of the official unemployment rate as a measure of labor market conditions in these economies. In some economies, however, the official unemployment rate is meaningless as an indicator of labor constraints on economic growth. An example is India whose official unemployment rate stands at less than 4 percent. This official rate is pretty meaningless; the expansion of the modern sector in India is not held back by labor constraints.

The notion of maturity, second, does not require an exogenous growth rate of the labor supply in efficiency units. The natural growth rate may respond to labor shortages, both because of induced technical change as firms search for labor saving innovations and because in open economies high employment rates may soften the attitudes of policy makers and the electorate towards immigration. This endogeneity is compatible with maturity. Long-run labor constraints are relevant – even with an endogenous natural growth rate – as long as the natural rate has an upper limit and does not adjust fully to any possible increase in the growth rate of aggregate demand.<sup>4</sup>

Extensions of the model that include endogeneity of the natural rate do not change the qualitative argument, and to simplify the exposition I shall take the natural growth rate  $n$  – the growth rate that is required to maintain a constant, target rate of employment – as given. For convenience the target rate of employment will be referred to simply as 'full employment'.

Now consider the equilibrium condition for the goods market in a mature economy. With a constant capital output ratio,  $K/Y = \nu$ , the accumulation rate  $g$  must be equal to the growth rate of output. Thus, full-employment growth requires that  $g = n$ , and the share of public and private consumption must take a particular value:

$$\frac{C + G}{Y} = f(t, w) + \gamma = 1 - (n + \delta)\nu \quad (3)$$

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<sup>4</sup>Maturity in this sense excludes specifications like the one in Dutt (2006). Dutt assumes that the *growth rate of the growth rate* of labor productivity depends on the employment rate. This assumption implies that productivity growth becomes perfectly elastic in the long run. There is no upper bound on productivity growth and no long-run supply constraints from the labor market. The US or the European economies can achieve long-run growth rates of 5, 10 or 20 percent annually without encountering labor constraints.

The size of the public sector – the share of government consumption in income ( $\gamma$ ) – is contentious: people differ widely in their views on the role of government and the appropriate share of government spending in GDP. Arguably, however, the exigencies of demand management should not be decisive in the determination of the levels of spending on government programs. I therefore take  $\gamma$  as exogenous.<sup>5</sup>

Taking  $\gamma$  as given, equation (3) – the condition for full-employment growth – must be satisfied through adjustments in private consumption. The ratio of private sector wealth to potential output ( $w$ ) is predetermined in the short run and, having pinned down  $n, \delta, \nu$  and  $\gamma$ , there is only one free variable, the share of taxes in income. Thus, equation (3) determines a full-employment trajectory for the tax rate  $t$ . Government debt and household wealth ( $\omega = \nu + b$ ) change endogenously over time, and the tax rate associated with full-employment growth therefore will be time-varying too.

Intuitively, consumption – private or public – must fill the gap between full-employment output and investment. This gap can be large when low natural rates of growth limit the need for additional capital capacity: if the private saving rate is high and the government runs a balanced budget, the warranted growth rate may exceed the natural growth rate. When this happens, the economy faces ‘structural aggregate demand problems’ or, using Hansen’s (1939) terminology, ‘secular stagnation’.<sup>6</sup>

Secular stagnation calls for fiscal policy along the lines suggested by Lerner’s principle of functional finance.<sup>7</sup> Private saving rates that are excessive in relation to the natural growth rate can be countered by a reduction in taxes and an increase in the government deficit (which raises consumption and reduces

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<sup>5</sup>This argument does not rule out changes in the timing of government spending to counteract recessions or serious overheating of the economy. Uncertainty, lack of information, and lags of all kinds complicate stabilization policy. The lags and inflexibilities may be particularly severe for fiscal policy, at least in the US; many European economies with parliamentary systems have greater flexibility. Ryoo and Skott (2017) analyze the stabilization of a Harrodian economy using fiscal and monetary policy; see also Franke (2018).

<sup>6</sup>Recently, Summers (2013, 2015) has generated widespread interest in the possibility of secular stagnation; Krugman (1998) raised similar issues for Japan.

Outside the mainstream, structural aggregate demand problems have been discussed by, among others, Godley (1999), Wray (2000), Skott (2001), Palley (2002) and Nakatani and Skott (2007).

<sup>7</sup>The principle of functional finance

"prescribes, first, the adjustment of total spending (by everybody in the economy, including the government) in order to eliminate both unemployment and inflation ... ; second, the adjustment of public holdings of money and of government bonds, by government borrowing or debt repayment, in order to achieve the rate of interest which results in the most desirable level of investment; and, third, the printing, hoarding or destruction of money as needed for carrying out the first two parts of the program." (Lerner 1943, p. 41)

The setting of interest rates to achieve a "desirable level of investment" in the short run translates into choosing a desirable capital-output ratio in the long run. By assumption, fiscal policy is designed to keep output at the level associated with full employment, and  $I/Y = (I/K)K/Y - (n + \delta)(K/Y)$ . Thus, choosing the investment-output ratio corresponds to choosing the capital-output ratio in the long run.

the aggregate saving rate). Analogously, private saving rates that are too low relative to the natural growth rate call for contractionary policies (which raise the aggregate saving rate).

The use of fiscal policy to counteract long-run aggregate demand problems raise questions of ‘debt sustainability’. Countless exercises have addressed the sustainability question by looking at the implications of exogenously specified paths of primary deficits and aggregate output (e.g. Chalk 2000). Exercises of this kind represent a peculiar approach to policy. If it is taken for granted *a priori* that output will follow some exogenous trajectory of ‘potential output’, then by assumption there is no need for fiscal policy. And if one abandons the exogenous output trajectory, why would anyone want to maintain a constant ratio of primary deficits to GDP? Arbitrary policies rarely bring great results. If fiscal policy is used sensibly in accordance with ‘functional finance’, primary deficits will not be independent of movements in private-sector demand. On the contrary, fiscal policy must be adjusted continuously to keep aggregate demand growing at a rate that is consistent with full employment and price stability. The sustainability analysis should consider sensible policies of this kind.

Continuous adjustments of the tax rate  $t$  to satisfy equation (3) generate dynamic trajectories for government debt and private wealth. Taxes  $T$  are net of transfers, and transfers are defined in equation (1) to include interest payments on the public debt. Thus, at each moment the change in government debt is given by

$$\dot{B} = G - T = (\gamma - t)Y$$

or

$$\dot{b} = \gamma - t - nb \quad (4)$$

where  $b = B/Y$  is the debt-GDP ratio and the tax rate  $t$  is determined by equation (3). The tax rate depends on the wealth ratio  $w$ , and we have  $w = \nu + b$ . Substituting the solution for the tax rate into equation (4), we get a one-dimensional differential equation to determine the dynamics of the debt ratio  $b$ .

The precise implications for public debt depend on the specification of consumption behavior. The qualitative properties are quite robust, however:<sup>8</sup>

- A fiscal policy based on functional finance produces strong stabilizing effects on the debt-income ratio. As debt increases, households’ wealth and interest income both increase. Consequently, private consumption demand will tend to rise, fiscal policy needs to be tightened, and the debt ratio ceases to grow. These stabilizing feedback effects produce a stable stationary solution for the debt ratio,  $b \rightarrow b^* < \infty$ .

This result addresses the long-run sustainability question: low growth rates of potential output necessitate expansionary policy if secular stagnation is to be avoided. But the debt ratio need not explode.

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<sup>8</sup>Ryoo and Skott (2013) consider a stock-flow consistent Keynesian model; Skott and Ryoo (2014) analyze a standard OLG models, and Skott and Ryoo (2017) a modified ‘Keynesian OLG model’; Skott (2016a, 2016b) discuss the main findings in greater detail. An earlier paper by Schlicht (2006) derived some of the results using a traditional Keynesian model.

- High natural rates of growth are associated with low long-run values of the debt ratio  $b^*$ , and the causal link unambiguously runs from growth to debt.

This result has obvious implications for the interpretation of negative correlations between debt ratios and the rate of growth. The influential study by Reinhart and Rogoff (2010) contained elementary spreadsheet errors, but a negative correlation can still be found in the data (albeit in a much milder form) after correction of these errors. Correlation, however, is not causation, and the model shows that we should expect a causal effect from low growth to high debt. In the model, the high debt unambiguously represents an effect, not a cause of low growth.<sup>9</sup> A less expansionary policy would not raise the rate of economic growth but lead to secular stagnation.

- The long-run debt ratio  $b^*$  depends on the structure of taxation. Taxing low income households with a high marginal consumption rate produces a high debt ratio; taxing high income households with a low marginal consumption rate produces a low debt ratio.

This result has implications, *inter alia*, for the recent Trump tax reform in the US. Other aspects of the reform – including its direct implications for inequality – may be much more significant, but the reform implies that the long-run debt ratio will increase as the relative tax burden shifts from the rich towards low and middle income households. The short-run increase in deficits and public debt following the tax cuts will not be reversed in the long run, if full employment is to be maintained.

- Paradoxically, high levels of government consumption produce low debt ratios in the long run.

This result has implications for austerity policies which aim to reduce public debt by cutting government consumption. These policies can have – and have had – devastating short and medium run economic and social consequences, and the political fallout has included the rise of right-wing nationalism. The analysis shows that in the long run, the policies will also fail on their own terms in economies with a structural demand problem: a return to full employment will require an increase in the debt ratio if the share of government consumption in income has been reduced.

Clearly fiscal policy does not always follow a pure functional finance prescription – European austerity policy after the financial crisis is an obvious example. But real-world policies often amount to a kind of ‘impure functional finance’. It is no coincidence that Japanese public debt rose rapidly from the early 1990s or that the US implemented a fiscal stimulus package in 2009. The analysis of ‘pure functional finance’ therefore has real-world relevance. It is of descriptive interest because of automatic fiscal stabilizers and because policy makers facing

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<sup>9</sup> A number of studies, including Ash et al. (2017), find evidence that slow growth tends to precede the rise in debt. It is difficult, however, to establish causal links between debt and growth from purely empirical methods. Theory is needed to help sort out long-run causation.

high unemployment will be pulled towards expansionary discretionary policies. It is of prescriptive interest because it shows that fears of 'debt unsustainability' are unfounded but that the debt implications depend on the structure of taxation.

There are complications and caveats. Economies, first, that do not issue debt in their own currency cannot control the interest rate on public debt and may be forced to default, a possibility that severely limits their policy space. Even if debt is being issued in a sovereign currency, second, the conduct of fiscal policy in open economies must consider the balance of payments and the real exchange rate as well as unemployment and inflation. High debt levels, finally, can have negative side effects with respect to the effectiveness of monetary policy and the intra-generational distribution of income.

But functional finance starts from the right premise: fiscal and monetary policies should be judged on their implications for outcomes that we care about. Moreover, fiscal policy can be crucial in addressing structural aggregate demand problems: in the absence of a sustained fiscal stimulus, a mature economy may experience a structural aggregate demand problem or 'secular stagnation'. The achievement of full employment growth may require low taxes (high disposable income) and/or high public debt (high ratios of household wealth to income) in order for consumption to fill the gap between full-employment output and the sum of investment and government consumption.

## 4 Dual economies

Dating back to Lewis (1954), stylized versions of dual economies have distinguished between two sectors, a modern/formal sector and a traditional/informal sector. As a first approximation, the supply of labor to the modern sector is perfectly elastic. The capital stock in the modern sector – rather than the labor supply – represents the binding supply-side constraint in the modern sector, and this difference fundamentally alters the policy problem.

It is the low natural rate of growth that generates a structural aggregate demand problem in mature economies. This problem does not arise in dual economies. There are no labor constraints and fast accumulation is desirable – the faster the accumulation rate the better. In a dual economy it should be a top priority to expand the modern sector and create high-productivity jobs for the underemployed workers in the informal sector.

The absence of labor constraints does not imply that there are no supply-side constraints on the expansion of the modern sector. Utilization rates in the modern sector vary significantly in the short run, and stabilization policy can be essential in economies with any kind of Harrodian instability. Upward instability will be curbed eventually by capacity ceilings, but can cause serious damage in the form of inflation and/or balance of payments crises if the instability remains unchecked until these limits kick in; downward instability meets no similar capacity floors, and stabilization policy may be necessary to prevent crises and long term stagnation. But stabilization is distinct from permanent

fiscal stimulus.

Assuming successful stabilization, the capital-output ratio fluctuates around levels associated with the desired rate of utilization, and the economy faces a consumption-investment tradeoff. The expansion of the modern sector requires high accumulation rates, and high accumulation rates are associated with high shares of investment in income.<sup>10</sup>

A one-sector model can be used to formalize this argument if it is assumed that the modern sector can draw on an infinitely elastic labor supply from the traditional sector but that otherwise each of the two sectors is entirely self-contained. With this assumption the equilibrium condition (2) still holds for the modern sector. The difference compared to the mature economy lies in the absence of labor constraints; there is no natural rate of growth for the modern sector in a dual economy.

Re-writing equation (2), we have

$$g = [1 - \frac{C}{Y} - \frac{G}{Y}]/\nu - \delta = [1 - f(t, w) - \gamma]/\nu - \delta \quad (5)$$

From equation (5) it follows that consumption must be squeezed to allow high accumulation. This squeeze on consumption can be achieved by increasing taxes. Successful development therefore will typically be associated with low government deficits and low public debt: the higher is the growth rate  $g$ , the lower must be the share of private consumption  $f(t, w)$ , and the higher, therefore, the required share of taxes in income and/or the lower the debt ratio  $b$  and the ratio of private sector wealth to income  $w$ .

Several comments may be in order. It is important to emphasize, first, that squeezing consumption need not imply a reduction in the living standards of the poor. Not all profits are invested, and many dual economies have rich elites. In principle, the resources for investment could come from policies that curb luxury consumption; in practice the political and economic power of the elites present obstacles to policies along these lines. It should be noted also that large parts of 'consumption' are mislabelled and should be considered investment. An obvious example is the misleading classification of public spending on education as public consumption. Spending on healthcare, food and housing for low-income families also contain significant elements of investment: a healthier and better educated workforce can raise labor productivity and profitability in the modern sector, and improve the prospects for future growth. Thus, prioritizing investment does not imply squeezing everything that is classified as consumption in the national accounts.

Second, it is clearly not enough to create space for private sector investment by cutting down consumption. Many essential investment projects will not be carried out by the private sector. Public investment in infrastructure, education and health is crucial for successful development; it complements and crowds in private investment. In this context it should be noted that not all modern-sector activities are equally conducive to long-term economic growth and that

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<sup>10</sup>The investment share has approached 50 percent in China, and the positive correlation between growth and the investment share is well established (e.g. Girardi and Pariboni 2018).

industrial policy can play a decisive role in promoting structural transformation (e.g. Chang 2008).

Third, because of the importance of public investment it may be useful to distinguish explicitly between government consumption and government investment. Let  $\gamma$  denote the share of government *consumption* in income and let  $\mu$  be the fraction of total investment that is undertaken by government,  $I^G = \mu I$ . If the growth rate  $g$  and the capital-output ratio  $\nu$  are given independently of the share of government investment in total investment, it is now readily seen that a rise in the share of government investment increases the government deficit. The required tax share  $t$ , which is determined by equation (5), will be independent of  $\mu$ . By contrast,  $\mu$  affects the share of total government spending which is given by  $\gamma + \mu g$ . Consequently, the importance of public investment introduces a caveat with respect to the inverse relation between public deficits and successful development. The deficits are increasing in  $\mu$ , and to the extent that successful development – fast growth of the modern sector – is associated with active government intervention and a large share of government investment in total investment, the implications for government deficits become ambiguous.

Equation (5) and the formal analysis in this paper, fourth, has focused on long-term growth, largely ignoring critical and difficult issues of stabilization. Macroeconomic instability deters long-term private investment, and aggregate demand policy should aim to secure a stable macroeconomic environment with appropriate levels and growth rates of demand for the output of the modern sector. Recessions should be countered by expansionary measures but, equally important, overheating of the economy should be avoided. The use of monetary policy to target inflation poses particular dangers in this respect. To the extent that the use of interest rates to control inflation is successful it may owe its success in large part to the effects on the real exchange rate. Exchange rate appreciation can put a damper on inflation, but overvalued exchange rates and balance of payments crises can also do great damage. Large fluctuations in real exchange rates, more generally, impede the long-run development of a modern tradable sector.<sup>11</sup>

As an illustration, consider the Brazilian experience since the early 2000s. The Brazilian economy benefitted from the commodities boom which saw broad indices of commodity prices treble between 2002 and 2008 and then – following a blip immediately after the financial crisis – return to and fluctuate around the 2008 level until 2014.

The commodities boom relaxed the balance of payments constraint, and Brazilian GDP grew relatively fast at about 4 percent between 2003 and 2011. The growth was driven in large part by consumption which increased at an average rate of about 5 percent. Private consumption was boosted by an impressive reduction in inequality; the Gini coefficient fell from about 58 percent in 2002 to 52 percent in 2014. The real minimum wage increased by more than 5 percent a year between 2000 and 2014, and social transfers expanded significantly, partly

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<sup>11</sup>The argument in this section has affinities with development theory, both new and old; e.g. Razmi et al. (2012), Ros (2013), Bresser-Pereira et al. (2015), Damill et al. (2016).

as a result of indexation of many programs to the minimum wage (Summa and Serrano 2018). Policy intervention also contributed to a relaxation of credit constraints. Household debt increased from 10 percent of GDP in 2003 to more than about 25 percent by 2012; car sales more than trebled between 2002 and 2012; GDP from construction almost doubled between 2002 and 2012; and the ratio of employment in non-tradables over tradables sector rose from about 1.15 in 2002 to more than 1.6 in 2015 (Garber et al. 2018).

Inflation was kept in check by an appreciation of the Real. Inflation, which had peaked at over 17 percent in 2003, declined rapidly between 2003 and 2007, as the exchange rate moved from 3.8 Reais to one US dollar in 2003 to 1.6 Reais to the dollar in 2008. From 2007, however, inflation started increasing again, rising from about 3 percent in 2007 to about 10 percent in 2014. The current account had moved into surplus in 2003 – partly reflecting the rise in commodity prices and the benefits of a real depreciation of the Real between 2000 and 2003 – but the surplus was short-lived. The current account soon deteriorated; it moved into deficit in 2007, and the deficit widened in the following years.

By 2014 Brazil was already moving towards a recession when commodity prices dropped precipitously. A deep recession followed, and ascendant right-wing movements are busily working to reverse the gains in income distribution.

This rough outline raises several questions. The large reductions of inequality were real achievements. But the distributional progress would have become more sustainable and the economy would have been in a better state when commodity prices collapsed, if some of the windfall gains from the commodity boom had been used to expand the formal sector. The relaxation of the balance of payments constraint could have allowed faster accumulation as well as some increase in consumption, without running up deficits on the current account. This did not happen. The share of investment in GDP increased modestly from a trough of about 18.5 percent of GDP in 2002-2005 to about 21 percent 2006-2008, but residential investment made up an increasing proportion of total investment (and the overall investment share stayed below its levels in the mid 1990s and far below the levels in the 1970s). The profit share started to fall from 2004 (Martins & Rugitsky 2018).

Putting it differently, the analysis points to some unpleasant Marxian arithmetic. In order to achieve significant, sustainable gains for the poor as well as an increase in accumulation, it may be necessary to confront entrenched interest and cut luxury consumption. The commodities boom gave Brazilian policy makers extra degrees of freedom, but their failure to confront the hard choices sacrificed accumulation and real progress in the structural transformation of the Brazilian economy in favor of short term transfers. This left Brazil – and the left-wing movements in Brazil – in a bad place when the commodities boom came to an end.

## 5 Conclusion

The general theme of this paper can be put succinctly: the supply side matters.<sup>12</sup> It is important to make this fairly obvious point in part because the supply side has not always received the attention it deserves in the post-Keynesian literature.<sup>13</sup>

A recognition of the supply side has more than purely academic interest. Aggregate demand policies that work well in one economy may be disastrous in economies with a different supply side. The distinction between stylized mature and dual economies illustrates this general point.

A permanent stimulus may be needed in mature Harroldian economies with a low natural rate of growth. The warranted growth rate must be brought into equality with the natural rate, and the fiscal stimulus is helpful precisely because it retards the warranted rate. In dual economies, by contrast, a retardation of the warranted growth rate is the opposite of what one wants. Policy, instead, should aim at stabilizing the actual growth rate at a high warranted rate.

If the expansion of the capital stock relies on private investment, incentives must be created for firms in the modern sector to carry out the investment. Adequate demand for the formal-sector output becomes critical, and the management of aggregate demand becomes an essential prerequisite of fast growth. But capital constraints complicate the picture: it is not enough to create incentives for investment, the resources for investment must be available too.

In a capital constrained economy, a sustained increase in the rate of accumulation requires reductions in the shares of private or public consumption (or an increase in net imports). Simply boosting aggregate demand is not a viable development strategy. Dual economies face a two-fold challenge. They must create incentives for the expansion of the modern/dynamic/high-productivity sector and ensure that the resources for expansion will be available.

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<sup>12</sup>The paper has not addressed the most challenging supply side constraint. Climate change – and environmental problems more generally – pose existential threats to all economies. A recognition of these threats, however, does not obviate the need to analyze the ways in which other supply-side constraints affect different economies. These differences exist independently of the environmental challenges, and an understanding of the differences will be important in designing policies to meet the challenges.

<sup>13</sup>Some prominent contributions appear to see the absence of supply-side constraints as a defining characteristic of the Kaleckian strand of post-Keynesian economics. Lavoie (2014) outlines "four crucial aspects" of the Kaleckian approach, one of them being that "the rate of utilization is assumed to be generally below unity, and labour is assumed not to be a constraint" (p. 360). In a similar vein, Hein (2014) describes the Kaleckian approach as treating "the rate of capacity utilization as an adjusting variable, not only on the short run, but also in the medium and long run" (p. 243) and suggests that "the labour supply cannot generally be seen as a constraint to growth" (p. 181)

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