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Public debt, secular stagnation
and functional finance

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Abstract:

Fiscal policy and public debt may be required to maintain full employment and avoid secular stagnation. This conclusion emerges from a range of different models, including OLG specifications and stock-flow consistent (post-) Keynesian models. One of the determinants of the required long-run debt ratio is the rate of economic growth. Low growth leads to high debt, and empirical correlations between growth and debt may reflect this causal effect of growth on debt, rather than negative effects of debt on growth. A second result relates directly to austerity policies. The level of government consumption and the structure of taxation influence the required debt ratio and, paradoxically, austerity policies are counterproductive on their own terms: cuts in government consumption lead to an increase in the required level of debt.

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1   Introduction

An influential study by Reinhart and Rogoff (2010) claimed to have shown that a rise in the ratio of public debt to GDP above 90% is associated with sharp declines in economic growth. This finding was used repeatedly by policy makers as a justification for strict austerity policies. House Budget Committee Chairman and former Republican vice-presidential candidate Paul Ryan declared that "[e]conomists who have studied sovereign debt tell us that letting total debt rise above 90 percent of GDP creates a drag on economic growth and intensifies the risk of a debt-fueled economic crisis."[3]   Meanwhile, on the other side of the Atlantic, European Commissioner Olli Rehn claimed that "it is widely acknowledged, based on serious research, that when public debt levels rise about 90% they tend to have a negative economic dynamism, which translates into low growth for many years. That is why consistent and carefully calibrated fiscal consolidation remains necessary in Europe."[4]

The Reinhart and Rogoff numbers were wrong. When Thomas Herndon, a graduate student at the University of Massachusetts, tried to replicate the study, he discovered simple spreadsheet errors and a peculiar weighting scheme (Herndon et al. 2014). The corrected figures still show a negative correlation between economic growth and the debt ratio. But there is no cliff and this undermines the argument for austerity in the middle of a deep recession; if there is no cliff, the debt problem -- if it is a problem -- can be addressed when the economy has recovered, even if this postponement implies a temporary rise in debt.

More importantly, correlation does not imply causation. The policy argument against debt relies on the explicit or implicit assumption that high debt causes low growth. The causation, however, could go the other way -- or a third factor could explain both low growth and high debt, or the correlation could be completely spurious. Reinhart and Rogoff do not make strong

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[3]http://thinkprogress.org/economy/2013/04/16/1875541/11-republicans-who-cited-a-flawed-study-to-push-for-drastic-spending-cuts/

[4] http://ec.europa.eu/commission_2010-2014/rehn/documents/cab20130213_en.pdf

claims about causality in their paper, but interviews and comments on the results paint a different picture. In the words of Matthew O'Brien (2013), "R-R whisper 'correlation' to other economists, but say 'causation' to everyone else."

One may try to address the causation issue empirically and, doing that, Irons and Bivens (2010), Basu (2013), Dube (2013) and Ash et al. (2015) all find evidence that slow growth tends to precede the rise in debt. This, indeed, is what one would expect from a short-run perspective: tax revenues fall and deficits widen in a recession, leading to a rise in the debt ratio. Results about short- and medium-run Granger causality, however, have no direct implications for the existence of possible long-run causal links between debt and growth. Theory is needed to help sort out long-run causation.

In line with contemporary macroeconomic theory, policy discussions usually assume that employment rates are unaffected by aggregate demand policy in the long run. Demand policy plays a useful role in short-run stabilization but the preferred instrument is monetary policy, complemented by automatic fiscal stabilizers. Discretionary fiscal policy is seen as redundant for stabilization, if not directly harmful, and fiscal policy should be geared towards attaining a target debt ratio (Schmitt-Grohe and Uribe 2007, Kirsinova et al. 2009). These conclusions, I shall argue, are quite fragile. More specifically, in this paper I want to make three main points.[5]

Fiscal policy and public debt, first, may be required to maintain aggregate demand at levels consistent with full-employment growth. This result -- which emerges from a range of different models, including OLG specifications and stock-flow consistent (post-) Keynesian models -- sheds light on 'secular stagnation' and the discussions that followed Summers's (2013) intervention.

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[5] The analysis draws on work over the last 15 years, incl. Skott (2001), Nakatani and Skott (2007), Ryoo and Skott (2013, 2015) and Skott and Ryoo (2014, 2015). Similar positions have been presented by a number of (post-) Keynesian writers, incl. Schlicht (2006), Godley and Lavoie (2008), Wray (2000), Palley (2002, 2012), Michl (2013), Nersisyan and Wray (2010), Arestis and Sawyer (2010).

The presence of long-run aggregate demand problems, second, suggests a `functional-finance' approach (Lerner 1943). Following this approach, monetary policy may be used for short-run stabilization, but variations in interest rates take place around a level that induces the desired capital intensity (the desired choice of technique). This assignment for monetary policy leaves fiscal policy to ensure a long-run trajectory of aggregate demand that is consistent with full employment. The approach differs from analyses of debt dynamics in which the primary budget deficit is taken as exogenous. There is no good reason to assume exogenous deficits, and arbitrary policies typically produce bad results. The results of this kind of analysis therefore say little about the potential benefits of a sensible fiscal policy.

Both the rate of economic growth and the share of government consumption in total income, third, are among the determinants of the required long-run debt ratio. A low growth rate causes high debt, with clear implications for the interpretation of the observed empirical correlations between growth and debt: there are good theoretical reasons to expect a long-run causal effect of growth on debt. Austerity policies -- reductions in government consumption -- also increase the required debt ratio. Thus, austerity policies are counterproductive on their own terms. Changes in the structure of taxation, finally, have implications for debt. A standard recommendation has been to reduce the tax incidence on capital income; changes of this kind increase the debt ratio.

The focus throughout the paper is on closed economies with debt denominated in a fiat currency controlled by the central bank. Full employment is assumed to be well-defined, the growth rate of the labor force is exogenously given, and the policy question concerns how to maintain full employment using fiscal and monetary policy. Given these 'domain' assumptions, the analysis clearly does not apply directly to debt problems in Greece (that does not control its own currency) or employment problems in Brazil (with large amounts of hidden unemployment). Before addressing open-economy and dual-economy complications, however, it may be useful to consider a closed economy without large informal sectors and hidden

unemployment. It should be noted also that I take as given the many non-fiscal and non-monetary policies that may influence aggregate demand. Rising inequality, for instance, is likely to affect both aggregate demand and household financial behavior, and income distribution is itself affected by, inter alia, industrial and financial regulation and labor market policy. These interactions between income distribution and aggregate demand may have been critical for macroeconomic developments over the last 30 years. The focus in this paper, however, is on fiscal and monetary policy.

Section 2 outlines a simple model of functional finance. Section 3 describes some possible extensions, discusses the relevance of some key assumptions, and relates the analysis to contemporary macroeconomic theory, including the Krugman-Summers rediscovery of secular stagnation. Section 4 summarizes the main conclusions.

2   Functional finance

Lerner's 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 short-run policy problem can be illustrated using a simple model with an IS condition for the goods market and a central bank that sets the interest rate. Thus, let

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

In equation (1), consumption C depends on (pre-tax) income Y, taxes T, the real rate of interest r and the stock of household wealth W; investment I depends on income, the interest rate and the stock of capital K; government consumption G is exogenous. The stocks of wealth and capital are predetermined in the short run.[6]

If current inflation is already at the target, the policy problem becomes particularly simple: choose fiscal and monetary instruments to achieve full employment and the desired level of investment. If current inflation deviates from the target, temporary deviations from full employment may be desired. The details will depend on the determination of inflation -- the specification of the Phillips curve -- and the precise intertemporal welfare criterion. These complications are irrelevant for present purposes, and I shall take the targets Y^* and I^* as given. Thus, we need

$$I(Y^*,r;K) = I^* \tag{2}$$

$$Y^* = C(Y^*,T,r;W) + I^* + G \tag{3}$$

Equation (2) pins down the interest rate, and equation (3) can be met by using taxes T or government consumption G as the instrument.

The stock variables W and K evolve over time, but desirable full-employment trajectories typically converge to a steady growth path with a constant output-capital ratio. (Some of) the long-run policy issues can therefore be addressed by examining the fiscal and

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[6] Changes in interest rates lead to capital gains and losses on long-term assets, and wealth will not be predetermined. Thus, for simplicity it is assumed that all financial assets are short-term.

monetary requirements for steady growth at the 'natural growth rate' (the rate of growth of the labor force in efficiency units). An obvious limitation of this kind of steady-growth analysis is that it leaves stability questions unanswered; the stability question will be considered briefly in section 3.

In steady growth the share of investment in income is determined by the capital intensity of production and the growth rate. Putting it differently, investment determines the evolution of the output-capital ratio, and achieving Lerner's most `desirable level of investment' translates into achieving the `most desirable capital intensity' in the long run. As a particular example, if it is decided that social welfare calls for the maximization of sustainable consumption per worker (in efficiency units), the 'golden rule' stipulates that with a well-behaved production function, the net marginal product of capital must be equal to the growth rate of the labor force (in efficiency units). If the marginal product were less than the growth rate, the economy would be 'dynamically inefficient': the capital intensity would be too high and a Pareto improving trajectory with higher consumption at all times would be feasible.

A comment on the capital controversy may be in order here. The controversy highlighted the difficulties of constructing an aggregate production function and demonstrated, in particular, how theories that rely on movements along a smooth production function face intrinsic problems and contradictions. But the insights from the capital controversy do not imply that only one technique is available; nor do they invalidate the long-run identification of a desirable path of investment with a desirable choice of technique or the influence of the cost of finance on the choice of technique. Even in the absence of a smooth aggregate production function, any given cost of finance is associated with a particular technique.[7]

Having fixed the real rate of interest and the output-capital ratio $(Y/K)^*$, and assuming that

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[7] For simplicity, I take the cost of finance to be equal to the real rate of interest. Skott (1989, chapter 5) and Skott and Ryoo (2015) discuss the choice of technique.

output, capital and employment (in efficiency units) all grow at the natural rate n, the equilibrium condition for the goods market can be written

$$\left(\frac{Y}{K}\right)^* = \frac{C}{K} + \frac{I}{K} + \frac{G}{K} = \frac{C}{K} + (n+\delta) + \gamma \tag{4}$$

where δ is the rate of depreciation and γ the ratio of government consumption to capital. The need for schools, bridges, police officers, etc. will typically depend on the size of the economy, and for present purposes it seems reasonable to treat the long-run ratio of government consumption to the capital stock as exogenously given. The appropriate size of government is fiercely contested, of course, but the different positions on this issue are largely tangential to questions of how to maintain full employment.

Turning to consumption, a simple specification assumes that private consumption depends on disposable income and private sector wealth,

$$C = (1-s)Y^D + \sigma W \tag{5}$$

$$Y^D = Y + rD - T \tag{6}$$

$$W = K + D \tag{7}$$

C, Y^D and W denote consumption, disposable income and wealth, and ($1-s$) and σ the consumption propensities out of income and wealth (equation 5). Pretax private income is given by Y plus the interest on government debt rD, and disposable income is found by subtracting taxes T (equation 6). Disregarding incentive effects and assuming a homogeneous household sector, it is of no importance whether taxes are lumpsum or levied on a particular type of income (wages or capital income). The tax incidence, however, can be important for the debt dynamics if households differ in the saving behavior (Ryoo and Skott 2013; see also section 3 below). Total private wealth is the sum of fixed capital K and government debt D (equation 7).

Equations (4)-(7) can be combined with a standard accounting equation for the evolution of public debt. The result is a one-dimensional differential equation with a globally stable stationary solution (see Appendix),

$$(\frac{D}{Y})^* = \frac{s[(\frac{Y}{K})^* - \gamma] - \sigma - n - \delta}{[(1-s)n + \sigma](\frac{Y}{K})^*}$$ (8)

Equation (8) gives the required debt ratio (which can be positive or negative, depending on parameters). One of the determinants of the ratio is the rate of economic growth. By assumption, the growth rate is exogenously given in this model and causation is clear: low growth causes high debt. This inverse relation between growth and government debt is quite intuitive. Deficits are needed if households want to save 'too much', and the threshold defining `too much' depends on the growth rate: a higher growth rate implies more investment which means that a smaller deficit is required to maintain the overall balance between investment and total (private and public) saving. Thus, the debt ratio should be high in economies like Japan with a high saving rate s and low population growth n.

A second result relates directly to austerity policies. Cuts in government consumption reduce aggregate demand, and to maintain full employment, private consumption must take up the slack. For this to happen, taxes have to fall more than the fall in government consumption (the balanced budget multiplier in reverse), the government deficit rises, and there is an increase in the long-run debt ratio; austerity policies are counterproductive on their own terms.[8]

Aside from their intrinsic importance, third, changes in income distribution will influence aggregate demand and the required fiscal policy: an increase in inequality is likely to raise the

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[8] Schlicht (2006) derives these results for changes in the growth rate and government consumption in a closely related model.

saving rate and thereby the required debt ratio. A reduction in the real rate of interest, finally, may increase the capital intensity and reduce $(Y/K)^*$. [9] A lower output-capital ratio, in turn, implies a decline in the debt ratio.

3   Discussion

Robustness

The model in section 2 has an old Keynesian flavor, and the results are clearly at odds with Ramsey-type models. But it is the Ramsey model that represents the extreme case. Market economies do not automatically produce full-employment growth with an optimal capital intensity, even in a world of perfect competition, 'rational' behavior and perfect foresight (whatever one may think about these assumptions as an approximation to real-world economies). The key assumption behind the results in section 2 is simply that consumption depends on taxation and the level of debt. This rejection of Ricardian equivalence does not depend on irrational household behavior.

Consider a neoclassical OLG setting with optimizing households and perfect foresight. It has been known at least since Diamond (1965) that the real interest rate required to maintain full employment may be low, even negative, in OLG models, and that public debt becomes desirable if this happens and the economy becomes dynamically inefficient. More generally, even if the economy is dynamically efficient in the absence of public debt, it will not -- except by a fluke -- generate a socially optimal capital intensity. Public debt -- positive or negative -- can be used, however, to achieve the desired intensity and the associated real rate of interest.

Empirically, the rate of return on capital exceeds the growth rate. This finding has been interpreted as evidence that actual economies are dynamically efficient (Abel et al. 1989), and

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[9] As we know from the capital controversy, this need not happen.

in a dynamically efficient economy the socially optimal debt may well be negative: impatient households may save too little and the economy will not get to the desired capital intensity without additional saving by the public sector. The standard efficiency criterion, however, is based on an assumption of perfect competition and does not apply without modification in more realistic cases with imperfect competition: in the absence of perfect competition, high rates of profits may be due to monopoly rents rather than to a high 'marginal product of capital'. This imperfect-competition argument is quite general but the issue can be seen most clearly if the production function is Leontief: profit-maximizing firms that maintain some degree of excess capital capacity and set prices as a markup on marginal cost can show a positive rate of return, even though with excess capacity the marginal product is zero (Ryoo and Skott 2014).

A neoclassical OLG model assumes full employment at all times, and household saving automatically translates into investment. In a Keynesian setting, by contrast, the saving and investment decisions are separated. Households save but firms make the investment decisions, and a low (expected) return discourages investment. As a result, high saving rates can lead to aggregate demand problems rather than dynamic inefficiency. Returning to the illustrative Leontief case, firms will only want to expand their capital stock at a constant rate (a steady-growth requirement) if the capital stock is being utilized at the desired rate. If firms consider the utilization rate too low (too high), they will want to reduce (raise) accumulation until the desired rate has been reached; thus, the economy would not be in steady growth.[10] In the absence of a public sector and with a given growth rate of the labor force, this steady-growth condition on the utilization rate defines a unique saving rate for goods market equilibrium.[11] If households wish to save at a higher rate, public sector deficits are needed to

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[10] The notion of desired utilization has been the subject of intense debate in the post-Keynesian literature. 'Kaleckians' have suggested that there is no well-defined desired rate or, alternatively, that the desired rate is subject to path dependency (e.g. Dutt 1997, Hein et al. 2012). A classical/ Marxian/ Harrodian position views the desired utilization rate as largely structurally determined; there may be some indeterminacy or path dependency, but the range of variation is quite narrow (e.g. Committeri 1986, Kurz 1986, Skott 2012).

[11]If u^* denotes the output-capotal ratio at the desired utilization rate, steady growth at the natural rate n requires that

solve the aggregate demand problem and avoid secular stagnation (Skott and Ryoo 2015).

The analysis in section 2 can be extended in another direction. The model included two assets, fixed capital and government bonds. Fixed capital, however, does not enter households' portfolios directly in a corporate economy. Households may be the ultimate owners, but the ownership is mediated through financial assets in the form of equity. Moreover, it may be reasonable to include 'money' as a financial asset in addition to equity and government bonds. Ryoo and Skott (2013) analyze a post-Keynesian stock-flow consistent specification along these lines. The results are qualitatively similar to those in section 2 and those derived for OLG models: the long-run debt ratio is decreasing as a function of both the growth rate and the share of government consumption.

Ryoo and Skott (2013) also examine the effects of changes in the structure of taxation, showing that functional finance can produce unstable debt-income dynamics in some cases. The stability of the debt ratio in section 2 derives from two feedback effects. An increase in debt raises consumption both via the wealth effect and because of the rise in interest payments associated with an increase in debt. Functional finance calls for a rise in taxes to offset this stimulus to aggregate demand; distribution effects, however, can weaken the magnitude of the required tax increase and the stabilizing effect, if saving rates differ across households. A small tax increase on workers with a low saving rate may be sufficient to offset the demand effect from interest payments that go to high-saving rentiers. Consequently, an increase in debt can lead to a rise in the deficit, and the debt dynamics can become explosive. The remedy is straightforward: use taxes on capital income as the fiscal instrument, instead of taxes on wage income.[12]

$$n + \delta = \hat{K} = \frac{I}{Y}u^*$$

or, in equilibrium,

$$s = \frac{S}{Y} = \frac{I}{Y} = \frac{n + \delta}{u^*}$$

[12] In Lerner's formulation,

Staying with traditional Keynesian concerns, the steady growth path may be unstable. Monetary policy rules -- Taylor rules -- can contribute to the stabilization of an unstable economy but may not be sufficient, even when interest movements are not constrained by the zero lower bound (Franke 2015, Ryoo and Skott 2015). Interactions between fiscal and monetary policy complicate the picture: Taylor rules that are stabilizing for low debt ratios can become de-stabilizing if the debt ratio exceeds a certain threshold. Instability, moreover, may arise from a combination of fiscal and monetary policy rules which separately would stabilize the system (Ryoo and Skott 2015).[13]

Relevance

The doctrine of functional finance may not have been widely embraced in its pure form, but something close to it had widespread support within the profession during the heyday of Keynesian economics from the 1950s to the 1970s. Tobin (1986) commented that in "almost every recession prior to the most recent pair of 1979-82, fiscal stimulus, temporary or permanent, was deliberately applied to promote recovery" (p. 7) and, criticizing the Reagan-Volcker policy mix, commented that the tight-money-easy-budget combination "runs counter to long-run growth because it encourages present-oriented uses of GNP relative to future-oriented ones" (p. 12). The policy mix, in other words, created too little investment, thereby deviating from functional finance.

Macroeconomic theory swung away from Keynesian ideas in the late 1970s, but aggregate demand still influences fiscal policy, both via automatic stabilizers and discretionary policy. The stimulus package in 2009 may be the most prominent US example of demand-motivated fiscal

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"if for any reason the government does not wish to see private property grow too much (whether in the form of government bonds or otherwise) it can check this by taxing the rich ... The rich will not reduce their spending significantly ... By this means the debt can be reduced to any desired level and kept there." (Lerner, 1943, p. 49)

[13] Other recent papers have analyzed stabilization policy in unstable economies, including Asada et al. (2010), Hannsgen (2014), Costa Lima et al. (2014), Franke (2015) and Jayadev and Mason (2015).

policy from this period, but the Bush tax cuts in 2001 and 2003 were also in part motivated (or at least presented as being motivated) by the weakness of aggregate demand at the time.

In OLG models an exogenous rise in public debt will be associated with a fall in the capital stock and an increase in the return on capital. In this way -- by raising interest rates and crowding out investment in fixed capital -- public debt can hurt future generations. The link between debt and interest rates does not exist under functional finance: debt is only allowed to increase if an increase is necessary to maintain both full employment and the interest rate associated with the optimal capital intensity. The current obsession with austerity should be a reminder, of course, that fiscal policy is not always conducted in accordance with the principles of functional finance. But if governments pursue policies of `imperfect functional finance' -- that is, if there is a tendency for fiscal policy to become more expansionary when unemployment is high -- a plot of interest rates against the public debt ratio will show variations around a horizontal line. In the stylized model of perfect functional finance the real interest rate is constant and all observations fall on the horizontal line. Fluctuations around the line arise if variations in interest rates are used for short-run stabilization and/or if there are variations in the value of r that is deemed optimal.

---- Figure 1 about here

Figure 1 shows a scatter plot of the real interest rate on 3-month treasury bills against the debt-gdp ratio for the US, 1939-2014.[14] The evidence fails to support crowding out. The US has seen large variations in the debt ratio but the correlation with interest rates is, if anything, negative. This lack of support for crowding out is confirmed by more detailed studies. In the words of Engen and Hubbard (2005, p.83), "some economists believe there is a significant, large, positive effect of government debt on interest rates, others interpret the evidence as suggesting that there is no effect on interest rates". Bohn (2010, p.14) makes a similar statement about the difficulty of finding significant interest rate effects of debt. He goes on to

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[14] The picture is qualitatively similar for other interest rates.

suggest that a "leading explanation is Ricardian neutrality". Imperfect functional finance, however, would seem a more plausible explanation.

The relevance of functional finance can be questioned from another angle: policy makers may, it is suggested, be unable to control the real rate of interest on public debt. Chalk (2000, p. 319) argues that some OECD countries "have seen an explosion in their indebtedness to such an extent that the solvency of the public sector is brought into question", and Collard et al. (2015, p. 382) "take it as the starting point for our analysis that maximum debt is determined by lenders: a country can only borrow as much as lenders are willing to provide". It is clearly correct that countries with debt in foreign currency can face solvency problems and may be unable to control the interest rate on their debt. But there is no indication in these (and many other) papers that the argument is restricted in this way to a particular group of countries (like Greece or other Eurozone countries). Chalk discusses the US economy and Collard et al. calculate their sustainable debt levels using the same criteria for the US and Korea (with debt in their own currencies) and Greece and Ireland (whose situation is closer to that of a city like Detroit).

How can a sovereign state become insolvent if its debt obligations are denominated in a currency that it can print at will? By the same token, it is unclear how high debt can force a country to pay high interest rates; Japan has a gross debt ratio that exceeds 240% -- almost all of it in yen denominated obligations -- and the interest rate on its 10 year bonds is below 0.5%. A country that controls its own currency always has the possibility of monetizing the debt. A standard counterargument suggests that the inflationary implications of monetization rule out this policy. Inflation, however, is caused by excess demand pressures in goods and labor markets, and under functional finance an overheating economy calls for contractionary policy. To be persuasive, the inflation argument would need to show that high debt erodes the ability of policy makers to implement contractionary demand policies to counteract overheating. Otherwise the inflation arguments, like the sustainability arguments, merely point to the possibility of unhappy consequences from bad policy: Chalk and Collard et al. succeed in

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showing how strange results may follow when arbitrary policies are combined with various ad hoc assumptions about, inter alia, growth prospects and default risks.

Secular stagnation and structural liquidity traps

Since the 1970s macroeconomists have been obsessed with the need for 'microeconomic foundations'. Inspired by the Lucas critique (Lucas 1976), a generation of macroeconomists has preached the flimsiness of statistical correlation and the imperative of grounding all policy analysis in optimizing behavior. Yet, on the issue of public debt, the same profession largely seemed to embrace Reinhart and Rogoff's bivariate correlations as indicative of causal links. This conflict between the ruling theoretical paradigm and the nature of the policy debate is sharpened by the irrelevance of the level of public debt in the benchmark Ramsey model with Ricardian equivalence.

Recent interventions by Summers and Krugman (among others) become particularly interesting from this perspective. In his presentation at an IMF conference Summers (2013) brought up the dangers of 'secular stagnation'. The argument was somewhat tentative, but the mere fact that someone of Summers stature raised the issue at an IMF forum caused a stir. Summers (2015) elaborates on the argument and concludes that "finding ways to increase the demand to spend, no matter how counterintuitive, is likely to be an important part of the way forward" (p.65). Krugman has been making similar points in his discussions of liquidity traps and the lessons from Japan (e.g. Krugman 2013a).

The rediscovery of ideas with a continuous history in heterodox circles should be welcomed. But the unawareness (or deliberate neglect) of the work that has been done outside the mainstream is disappointing. Godley (1999) observed that the growth of the 1990s had "come about only as a result of a spectacular rise in private consumption *relative to income"* and that "if, as seems likely, private expenditure reverts to its normal relationship with income, there will be, given present fiscal plans, a severe and unusually protracted recession" (p.1, italics in original). He went on to argue that fiscal policy "is much too restrictive to be consistent with full

employment *in the long run*" (p. 9, italics in original). Wray (2000), along similar lines, suggested that unsustainable increases in consumer indebtedness had been masking the underlying demand problems. Palley (2002, pp. 28-29) argued that the adverse demand effects of a worsening income distribution had been kept at bay by mechanisms -- including household borrowing and the stock market boom -- that were "approaching exhaustion", and that "the U.S. economy is entering a period when systemic demand shortage is likely to be the major difficulty." Skott (2001, p. 134) argued that "the maintenance of sufficient aggregate demand to keep the economy at full employment" may require fiscal intervention or a negative real interest rate (and hence a positive, lower bound on the rate of inflation). Along similar lines, Nakatani and Skott (2007, p. 307) used a formal (post-) Keynesian model to argue that Japanese stagnation since the 1990s was caused by a "structural liquidity trap"; the proximate problem was "one of aggregate demand, but the demand deficiency is structural". More generally, the importance of income inequality for aggregate demand -- with derived effects on the growth rate and/or the level of employment -- has been a constant theme in the post-Keynesian and neo-Marxian literature.

It is not just a matter of acknowledging the existence of previous contributions. The non-mainstream work has not been superseded by a more complete and satisfactory account by Summers, Krugman and others. Summers' (2015) analysis remains quite sketchy and has as its centerpiece the notion that "equilibrium real rates of interest" have fallen. At best this seems unclear. The Euler equation may pin down an equilibrium rate of interest in a rarefied world of infinitely lived households and Ramsey optimization. Outside this world, however, fiscal policy and public debt are among the determinants of the equilibrium interest rate associated with long-run full employment. The implicit argument may be that shifts in the natural rate of growth or in factors (like increased inequality) that affect saving require a fall in interest rates (a rise in capital intensity) or a more expansionary fiscal policy. If this is the argument, it would seem that Summers is groping towards the story outlined above in section 2.

Krugman has argued forcefully that the slump is not the time to cut the debt.[15] This argument is fully in line with functional finance, but Krugman also suggests that "the United States has a long-run budget problem" that must be addressed at some point.[16] The nature of the long-run debt problem is not made clear, however. This is not to say that there can be no adverse consequences of high public debt. But these consequences have to be specified and balanced against the benefits.

De Long (2015) discusses fiscal policy in the medium run, arguing that the public sector needs to expand because of an increasing share of goods that are subject to some kind of market failure. This is an important point, but the analysis that follows is based on the premise that in the medium run "the economy is not at the zero lower bound" and that "monetary policy can adequately handle all of the demand-stabilization role" (p.1).

De Long also suggests that an increase in public debt may be desirable in the US because the interest rate on public debt has been below the growth rate. From a functional finance perspective, however, the interest rate on public debt is itself a policy variable. Given any chosen level of government consumption, fiscal and monetary policy can be adjusted to control both aggregate demand and the interest rate, with public debt emerging as a relatively unimportant consequence of the chosen policy combination. Policy makers could aim for a higher interest rate, but why finance the optimal level of government consumption (whatever determines this level) in a way that leads to higher interest payments? Is the aim to affect other interest rates that are also deemed too low? Are private investment and capital intensity too high? Alternatively, De Long's implicit assumption may be that in the medium and long run,

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[15] E.g. http://www.nytimes.com/2008/10/17/opinion/17krugman.html

[16] "Yes, the United States has a long-run budget problem. Dealing with that problem is going to require, first of all, sharply bending the curve on Medicare costs; without that, nothing works. And second, it's going to require some combination of spending cuts and revenue increases, amounting to at least 3 percent of GDP and probably more, on a permanent basis." (http://krugman.blogs.nytimes.com/2010/07/21/notes-on-rogoff-wonkish/

additional government spending must come at the cost of higher debt and a rise in interest rates. This assumption is at odds with the analysis in section 2: an increase in the share of government consumption in income is compatible with an unchanged interest rate, and it produces a long-run fall, rather than a rise, in the debt ratio.

To me these (and many other) examples illustrate the continued relevance of the macroeconomic work that has been exiled from the 'big' journals since the 1980s. Some of that work is very applied and policy oriented; some of it theoretical and mathematically rigorous. Thus, it is not correct when Eggertsson and Mehrotra (2014, p.1) suggest – undoubtedly in good faith -- that there has been no earlier attempts "to write down an explicit model in which unemployment is high for an indefinite amount of time due to a permanent drop in the natural rate of interest."

4   Conclusion

Statistical regularities may break down if there are changes in the economic environment, including policy regimes; the Lucas *critique,* in other words, is valid.[17]   But the attempted Lucas *solution* -- the route that economics took from the late 1970s -- represents a failed detour.[18] And an immensely costly one. Following a period of reckless deregulation and rising inequality, economies have been devastated by misguided austerity policies.

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[17]   The novelty of the Lucas critique should not be exaggerated. Similar points had been made by others, including Lerner (1943, p. 48) who argues that the introduction of Keynesian policy rules will affect expectations and change private sector behavior:

> "since one of the greatest deterrents to private investment is the fear that the depression will come before the investment has paid for itself, the guarantee of permanent full employment will make private investment much more attractive, once investors have got over their suspicions of the new procedure. The greater private investment will diminish the need for deficit spending."

'Goodhart's law' is another example,

> "Any observed statistical regularity will tend to collapse once pressure is placed upon it for control purposes." (Goodhart 1975).

[18]   The dominant strand of post-Keynesian economics also has shortcomings (Skott 2012, 2014). An alternative 'behavioral and structuralist' approach is outlined in Skott (2015).

Fiscal measures, according to the principle of functional finance, should be judged by their implications for employment, inflation and investment, not by moralistic notions of sound finance and the intrinsic virtues of balanced budgets; there is no special virtue in balancing the budget "over a solar year or any other arbitrary period" (Lerner 1943, p. 41). But perhaps it is not the objectives of functional finance that are controversial, at least in academic circles. Economic analysis of monetary policy looks for `optimal' policies (or policy rules), given a welfare function that includes employment and inflation and a model of the economy; a growing mainstream literature approaches fiscal policy in the same way.

The important conflict concerns not the objectives of policy, but the description and understanding of the economy in which the policies are meant to operate. Unlike the functional finance tradition, most of the recent literature considers a world in which there can be no aggregate demand problem in the long run and in which market mechanisms automatically produce full employment and an optimal choice of technique. This setting represents a poor approximation to the world in which we live. Thus, it is hard to disagree with Summers's (2015, p. 60) opening statement: "The events of the last decade should precipitate a crisis in the field of macroeconomics".

Abandoning the infinitely lived representative agent and Ricardian equivalence, robust results from a range of models show that fiscal policy can be essential for the management of demand, also in the long run. They show that low growth calls for a high debt ratio, that the required debt ratio increases if government consumption is squeezed, and that by raising the saving rates, an increase in inequality will also need to be compensated by more expansionary policies and an increase in the debt ratio.

Appendix

The government budget deficit -- and hence the change in debt -- is given by

$$\dot{D} = rD + G - T \tag{9}$$

Now let ε denote the budget deficit as a share of income,

$$\varepsilon = \frac{\dot{D}}{Y} = \frac{rD + G - T}{Y} \tag{10}$$

We want to derive time path of ε (and hence D) that is consistent with growth at full employment.

Using the definition of ε, disposable income can be expressed as $Y^D = (1 + \varepsilon)Y - G$ and the consumption-capital ratio becomes

$$\begin{aligned}
\frac{C}{K} &= \frac{(1-s)[(1+\varepsilon)Y - G] + \sigma W}{K} \\
&= (1-s)(1+\varepsilon)(\frac{Y}{K})^* - (1-s)\gamma + \sigma\frac{K+D}{K}
\end{aligned} \tag{11}$$

Combining equation (11) and the equilibrium condition (4) we can solve for ε,

$$\varepsilon = \frac{s((\frac{Y}{K})^* - \gamma) - \sigma - n - \delta}{(1-s)(\frac{Y}{K})^*} - \frac{\sigma}{1-s}\frac{D}{Y} \tag{12}$$

This expression shows the deficit-income ratio that is *required* in order to achieve full employment. Notice that both a higher debt ratio and a higher ratio of government consumption to income reduce the required deficit.

By definition, $\dot{D} = \varepsilon Y$ and it follows that

$$\begin{aligned}
\frac{d}{dt}(\frac{D}{Y}) &= \frac{D}{Y}(\hat{D} - \hat{Y}) \\
&= \frac{D}{Y}(\varepsilon\frac{Y}{D} - n) \\
&= \frac{s((\frac{Y}{K})^* - \gamma) - \sigma - n - \delta}{(1-s)(\frac{Y}{K})^*} - (\frac{\sigma}{1-s} + n)\frac{D}{Y}
\end{aligned} \tag{13}$$

This one-dimensional differential equation has a globally stable stationary solution,

$$\left(\frac{D}{Y}\right)^* = \frac{s\left(\left(\frac{Y}{K}\right)^* - \gamma\right) - \sigma - n - \delta}{[(1-s)n + \sigma]\left(\frac{Y}{K}\right)^*} \qquad (14)$$

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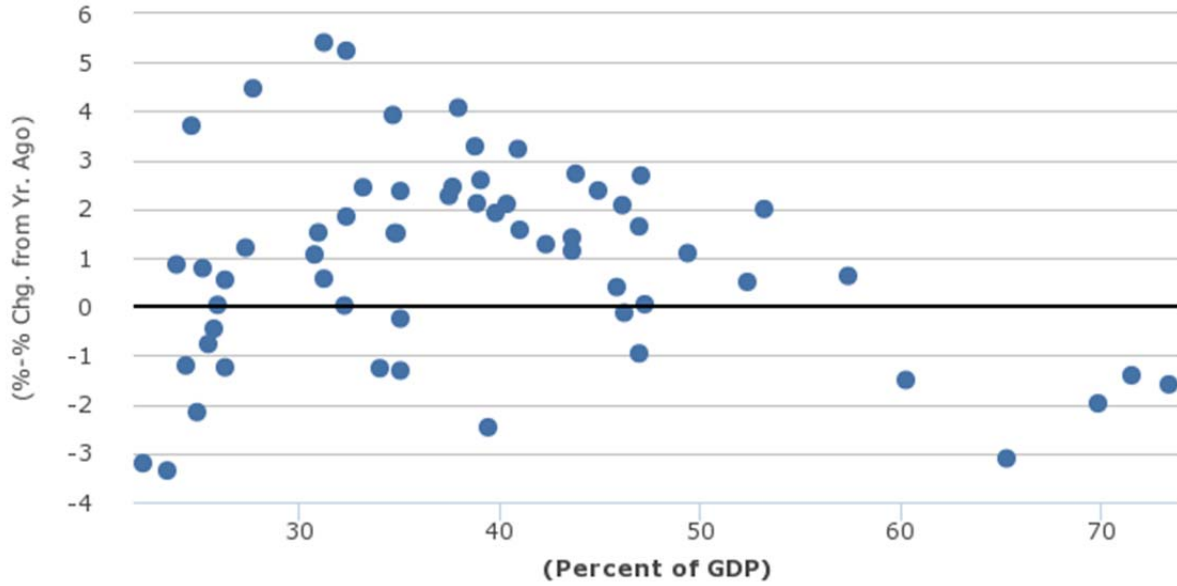
Figure 1: Real interest rates on 3-month treasury bills and the debt-gdp ratio.