

4 October 2016 -- FINAL

## **The “Natural” Interest Rate and Secular Stagnation: Loanable Funds Macro Models Don’t Fit the Data\***

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The point of this paper is that loanable funds macroeconomic models with their “natural” interest rate don’t fit the data. Before getting into the numbers, it makes sense to describe the models and how to think about macroeconomics in the first place.

New Keynesian macroeconomic orthodoxy in 2016 says that short- to medium-run performance is determined by “loanable funds.” Unimpeded interest rate adjustment should support robust macroeconomic equilibrium. Examples include the (visibly non-existent) “zero lower bound” on rates which is allegedly holding down investment and contributing to secular stagnation, the global “savings glut” keeping market rates near zero, and the “dynamic stochastic general equilibrium” (DSGE) models beloved by freshwater economists and central banks in which investment is determined by saving as a function of financial return.<sup>1</sup>

Loanable funds doctrine dates back to the early nineteenth century and was forcefully restated by the Swedish economist Knut Wicksell around the turn of the twentieth (with implications for inflation not pursued here). It was repudiated in 1936 by John Maynard Keynes in his *General Theory*. Before that he was merely a leading post-Wicksellian rather than the greatest economist of his and later times.

Like Keynes, Wicksell recognized that saving and investment have different determining factors, and also thought that households provide most saving. Unlike Keynes, he argued that “the” interest rate as opposed to the level of output can adjust to

assure macro balance. If potential investment falls short of saving, then the rate will, maybe with some help from inflation and the central bank, decrease. Households will save less and firms seek to invest more. The supply of loanable funds will go down and demand up, until the two flows equalize with the interest rate at its “natural” level.

In New Keynesian thinking, demand for investment can be so weak and the desire to save so strong that the natural rate lies below zero. The “distortion” imposed by the zero lower bound short-circuits the adjustment process, leading to calls for central banks to raise their inflation targets to reduce the “real” interest rate (nominal rate minus inflation). More straightforward interventions such as restoring labor’s bargaining power so that rising wages can push up prices from the side of costs, expansionary fiscal policy, or redistributing from the top one percent to households in the bottom half of the income size distribution whose saving rates are negative are apparently impossible for “political” reasons.

Mostly because saving is a residual quantity in ways to be discussed, loanable funds theory is not consistent with data on the composition of gross domestic product (GDP). To begin to see why, we can look at simplified numbers for 2014 from the Bureau of Economic Analysis national accounts for income and outlays of US households and business. The estimates below are expressed in trillions of current dollars. They are presented with one digit after the decimal point (one hundred billion dollars) and minor items are left out, so they don’t quite add up.

The sectors receive incomes “from production” (wages, profits, etc.), transfers (pensions, health insurance, etc.) from government at all levels, and from and to the rest of the world (or RoW). The American economy is heavily financialized, with large flows

of interest and dividend payments across all sectors. Details about sector-to-sector payments are not presented. Rather, each sector is treated as making transfers into a fictional accounting sector which then pays all the money back out. Overall, some sectors gain and others lose but you can't see the counter-parties.

Here are the numbers (trillions of 2014 dollars)

Household income		Household outlays		Business income		Business outlays	
Production	11.7	11.9	Consumption	Production	4.0	0.6	Taxes
Gov. trans.	2.5	3.0	Taxes	Fin. trans.	2.3	3.5	Fin. trans.
Fin. trans.	2.0	0.3	Fin. trans.	RoW trans.	0.4	0.2	RoW trans.
		0.9	Saving			2.4	Saving
	16.2	16.1			6.7	6.7	

The biggest contributor to household income from production is labor compensation. It makes up around 60% of the total of 11.7. The remaining 28% takes the form of transfers (much bigger than saving, incidentally). Payments from government are at 16%. Interest and dividends make up 12%. Note that households get a net financial transfer of 1.7 (= 2.0 – 0.3). The sum of this transfer and business saving of 2.4 is close to profits of 4.0 so essentially all earnings are retained or paid out to (mostly rich) households. Capital gains due to price increases of real estate and corporate equity are *not* included in national income accounts because they do not figure into the cost of production. In a typical year they exceed business saving. Via interest, dividends, and capital gains, profits are more than transferred to households. Around 70% of gains flow to the richest one percent.

On the spending side, household consumption exceeds income from production. Households also pay taxes and make transfers (mostly mortgage interest) to finance. Saving is the difference between incoming and outgoing payments flows 15 times its size. As such, it is bound to be difficult to estimate and to fluctuate over time. Consumption, especially of durable goods, does appear to be somewhat sensitive to interest rates. So saving must respond as well. The problem is that the relationship is bound to be erratic – the saving tail cannot wag the consumption dog.

Business earns 4.0 in profits, and makes large transfers to and from the financial sector and the rest of the world. After the transfers and paying taxes, it saves 2.67 times as much as households. How the interest rate is supposed to affect this saving flow is obscure. Contrary to loanable funds doctrine, a higher rate might in fact *reduce* saving by forcing business to increase financial transfers to other sectors.

As far as private sector saving is concerned, the bottom line is that it is not likely to be very sensitive to the interest rate. Moreover, private (especially household) saving does not play a major role in determination of macroeconomic equilibrium. The simplest Keynesian model states that output (say real GDP) is the ratio between total demand “injections” (household and business investment, government spending on goods and services, and exports) and the sum of demand-reducing “leakage rates” from private sector saving, taxes, and imports. The familiar multiplier is the inverse of this sum.

For 2014, sectoral average leakage rates (or ratios to GDP) were household saving, 0.05; business saving, 0.14; taxes, 0.28; and imports, 0.17. The total is 0.64, implying a multiplier of 1.56. This number is in the ballpark with the currently popular

value of 1.5. It is mostly determined by leakages for taxes and imports – both are unlikely to be sensitive to the interest rate.

Figure 1 shows that both saving and investment shares of households are fairly stable. Saving did not soar in the 1980s when interest rates were high nor plummet with low rates in recent years. The flows for business fluctuate across the cycle, with relatively small differences between investment and saving.

### Figure 1

Using a modicum of algebra, a slightly fancier approach is to ask how sectors would contribute to demand as output hypothetically varies. Define leakage rates as  $\lambda_h$  for households,  $\lambda_b$  for business,  $\lambda_g$  for government, and  $\lambda_r$  for RoW

Corresponding injections are expenditures on goods and services including investment levels  $I_h$  and  $I_b$  for households and business respectively; the sum of current and capital spending (but not transfers)  $G$  for government; and  $E$  for exports. In the first formula just below,

$$(I_h - \lambda_h X) + (I_b - \lambda_b X) + (G - \lambda_g X) + (E - \lambda_r X) = Total(X) = 0$$

each term in parentheses represents *net borrowing* by the corresponding sector (with  $X$  as total output or GDP). Interpreting the flows is straightforward. The only tricky part is that if the “home” country has a balance of payments surplus,  $E - \lambda_r X > 0$ , then the rest of the world must borrow from it.

Setting the sum of the flows, or  $Total(X)$ , to zero determines the level of output. A positive net borrowing flow means that the corresponding sector is stimulating

effective demand; a negative flow signals retardation. As output rises, net borrowing flows go down from levels set by injections until stimulus and retardation balance.<sup>2</sup>

Referring just to investment and saving, Keynes (1939) wrote that “Increased investment will always be accompanied by increased saving, but it never can be preceded by it....[C]redit expansion provides not an alternative to increased saving, but a necessary preparation for it. It is the parent, not the twin, of increased saving.” If “investment” is replaced by “injections” and “saving” by “leakages,” the quotation is a succinct description of the formula above.

Figure 2 for “Counter-cyclical net borrowing” shows the situation for the USA in 2014. At the observed GDP level of 17.35 (where the “Total” line crosses the horizontal axis at point A) the government contributes positively to effective demand. Because the other sectors have negative net borrowing (positive net lending), government demand floats the GDP boat. As functions of  $X$ , all borrowing flows go down as the economy expands so in this model they are counter-cyclical. A shift upward of any schedule will raise total net borrowing and increase output.<sup>3</sup>

## Figure 2

So what do loanable funds and the natural rate have to do with this diagram? Not very much. As discussed above, a fall in the interest rate might hold down saving by households and stimulate their residential investment. But the level and shallow slope of the household net borrowing schedule suggest that the impact on output would be modest. An upward shift of business net borrowing caused by higher investment would

add stimulus. But there is little evidence that business capital formation responds strongly to the interest rate.

Figure 2 depicts a thought experiment in which potential shifts in output away from point A set off responses that drive it back. If total net borrowing exceeds zero at a level of  $X$  below (to the left of) A, then along Keynes's lines output will rise back up. The national accounts are constructed on the assumption that injections equal leakages – the numbers say that the economy is always at a position such as A.

Figure 3 illustrates an accounts-based way of looking at the system. The four sectoral curves show levels of net borrowing added to current real output. The output curve itself threads the needle among the net borrowings, increasing at an approximate rate of 2.3% per year over the period in the chart. If one of those schedules were to shift, then output would adjust – again as suggested by Keynes. Changes in the interest rate might move one or another borrowing curve, but are not central to the story.

### **Figure 3**

Borrowing flows during the Great Recession provide a useful illustration. The output curve bent downward in 2007. At the same time, government borrowing rose as tax receipts dropped off and the Obama stimulus kicked in. Household and (especially) business borrowing dropped as saving rates went up. Later, they recovered. Borrowing by RoW roughly tracked GDP. The Fed funds rate was slashed by around five percentage points between 2007 and 2009. That may have helped support business investment and stabilize the household saving rate as the recession ended (see Figure 1), but the overall impact on the multiplier remained small. Applying Occam's Razor

suggests that automatic stabilizers and the stimulus package were the key factors in limiting the loss of GDP to a few hundred billion dollars per year and pushing GDP back toward its long-term growth path thereafter.

Wicksell and Keynes planted red herrings for future economists by concentrating on household saving and business investment. They did not observe that trade and government injections and leakages play bigger roles in determining effective demand. Keynes made a major contribution by switching the emphasis from interest rate adjustments to changes in income as the key macroeconomic adjustment mechanism. In so doing, he argued that the interest rate and asset prices must be set in markets for stocks, *not* flows, of financial claims. He pioneered national income accounting which now reveals the importance of leakages due to business saving, taxes, and imports.

He also invented a macroeconomic sociology of stagnation in which bear speculators forced interest rates to be high in the bond market and high saving “rentiers” held down demand. Today, the wealthy benefit from a big share of profits in GDP based on political wage repression. These profits are more than transferred to households by interest, dividends, and capital gains (with the latter mostly flowing to the rich). Asset price bulls are supported by low interest rates from the Fed. There has been a realignment of the classes since Keynes’s day, but his insight that capitalism favors the rich and tends toward stagnation remains valid.

Finally, writing in the *General Theory* after leaving his Wicksellian phase, Keynes said that “... I had not then understood that, in certain conditions, the system could be in equilibrium with less than full employment....I am now no longer of the opinion that the concept of a ‘natural’ rate of interest, which previously seemed to me a most promising



idea, has anything very useful or significant to contribute to our analysis (pp. 242-43).” Today’s New “Keynesians” have tremendous intellectual firepower. The puzzle is why they revert to Wicksell on loanable funds and the natural rate while ignoring Keynes’s innovations. Maybe, as he said in the preface to the *General Theory*, “The difficulty lies, not in the new ideas, but in escaping from the old ones... (p. viii).”

## Notes

\* Support from INET and comments by Thomas Ferguson, Duncan Foley, and Armon Rezai and Özlem Ömer are gratefully acknowledged,

1. Lawrence Summers (2014) highlights secular stagnation, acknowledging the idea’s Keynesian inspiration in the 1930s. Paul Krugman’s (2009) blog post on the zero lower bound is one of many based on misrepresentation of the standard IS/LM macro model. For a critique, see Taylor (2014).

2. The formula in the text is based on ideas by Wynne Godley, although he may not have used its exact formulation. See Wynne Godley and Marc Lavoie (2012).

3. The configuration of the chart is not inevitable. Germany looks like the US with fiscal and foreign roles reversed. A massive demand injection generated by the trade surplus is offset by low borrowing and/or net lending of the other sectors. Fiscal austerity would shift the government and total schedules downward, cutting aggregate demand.

## References

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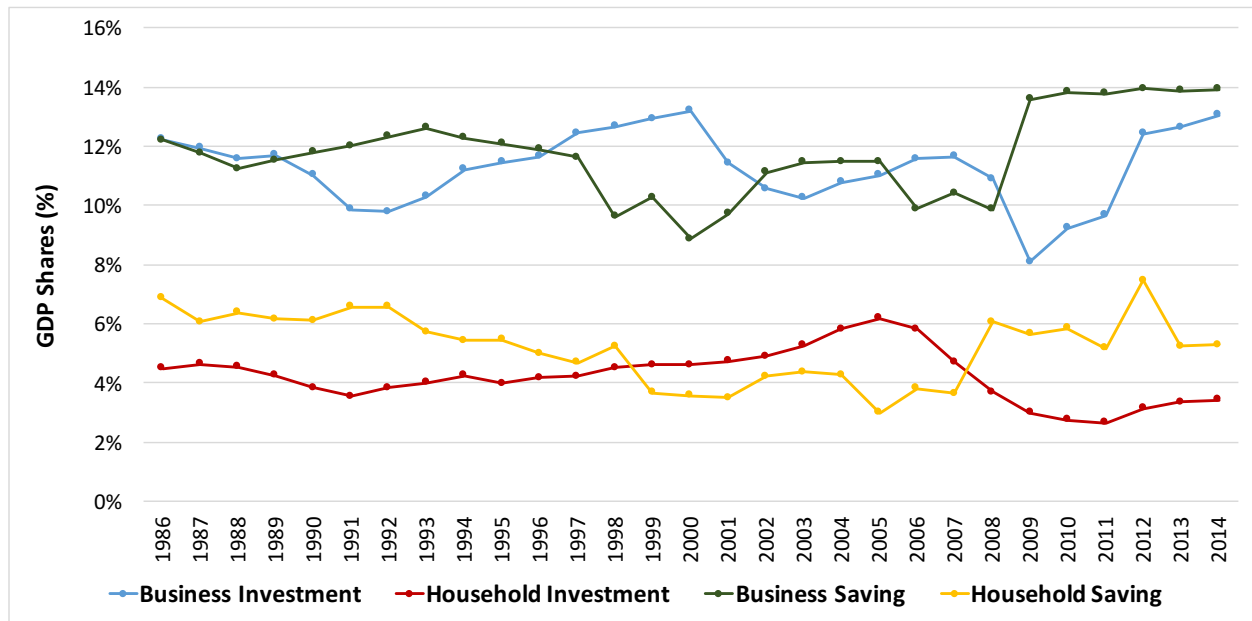
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Figure 1: US private sector investment and saving as shares of current GDP



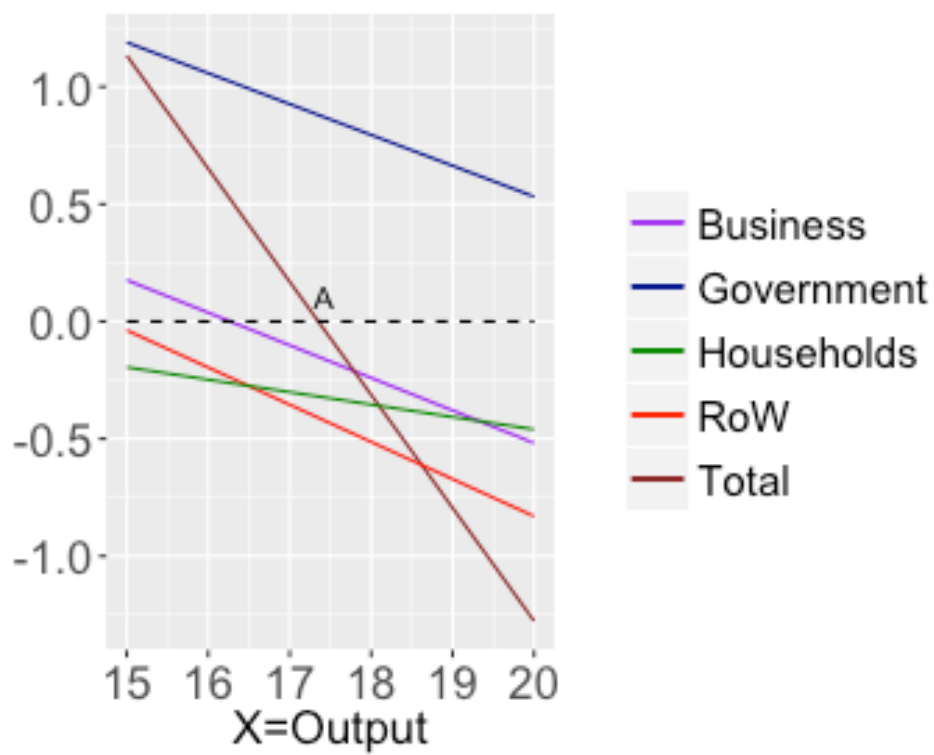
**Figure 2: US counter-cyclical net borrowing**

Figure 3: US net borrowing and GDP over time

