Institute for New Economic Thinking

Working Papers
ineteconomics.org/workingpapers

Synthetic MMT: Old Line Keynesianism with an Expansionary Twist

Lance Taylor*

Working Paper No. 103

October 2nd, 2019

ABSTRACT

Expansionary macroeconomic policy with a strong redistributive component is an attractive proposition, most recently launched on the basis of Modern Monetary Theory or MMT. The Theory is a synthesis of familiar ideas, newly relevant but scarcely path-breaking. Its basics – Chartalist or fiat money, functional finance, and models based on consistent national accounting – come straight from Maynard Keynes, Abba Lerner, and Wynne Godley. Functional finance is the heart of fiscalist Keynesianism built upon automatic stabilizers for the business cycle. MMT's job guarantee proposal is one more stabilizer which could be a modest helpful supplement to the system which exists. National accounting comparisons of a possible MMT package with the 2008 crash and the Trump tax cut are presented with emphasis on autonomous shifts in demand. The package could have problems with debt sustainability and external balance. Inflation is unlikely if wage repression in the USA is not reversed. But strong wage increases are presumably a goal of MMT.

Keywords: MMT, Modern Monetary Theory, functional finance, structuralist inflation theory

JEL Codes: E5, E12, E17

---

* New School for Social Research. Support from INET and comments by Nelson Barbosa and Thomas Ferguson are gratefully acknowledged.

Synthesizing new, useful compounds from those that exist is chemistry's task. Over the past decade or so, a group of macroeconomists synthesized Monetary Monetary Theory or MMT. With apologies to the chemists and uncited MMT authors it makes sense to examine what they created. Synthetic MMT is useful propaganda for expansionary policy. As macroeconomic theory it adds little to the ideas that it took in.

Invocation of foundational myths is central to any doctrine – just think of rational actors and Adam Smith in connection with microeconomics. MMT has three. They are the Chartalist view of money, functional finance with attention to business cycles, and consistent macroeconomic accounting. Consistent accounting shows how macroeconomic shocks like the Great Recession and the Trump tax cut compare to progressive economic stimulus with which MMT has been associated. Implications for inflation, debt dynamics, and open economy complications close the discussion.

Chartalism

Money has taken many forms, including innumerable local payment vehicles based on common consent (and, often in the USA, a work requirement). At the level of the state, MMT is one more member of the "fiat money" tribe. Its elder cousins included Sumerian temple coins before 3000 BC and paper notes in 7th and 13th century China and 17th century Europe.

Nowadays "money" is a number inhabiting a particular cell in a double entry macroeconomic spreadsheet for financial claims and counter-claims. It is created from "credit" whenever a bank or other financial institution makes a loan. MMT emphasizes state control over "narrow" money although it recognizes other channels for making payments. Money mostly comprises liabilities of banks and other financial institutions. The amount varies with the flux and reflux of credits extended.

Chartalism is a bureaucratic German view of money from the early 20th century.[1] It says that money is legally a creature of the state, incorporating a modern central bank. Money becomes the means of exchange because the state rules that it must be used to pay taxes.

This emphasis on taxation elides the nature of the state. In late 13th century China, Kublai Khan, grandson of Genghis and Emperor, introduced a paper currency manufactured from the inner bark of the mulberry tree. According to the Italian traveler Marco Polo, with a vermillion seal imprinted "…the money is then authentic. Anyone forging it would be punished with death." Here we have an example of Max Weber's view that the state wields a "monopoly on the legitimate use of violence."[2] At the national level, using authenticated money to pay taxes is unavoidable because the authorities will punish the person owing them if she or he does not comply.

Moreover, the state gives itself the right to rule that money must be used for payments connected with *all* authenticated contracts, not just tax obligations. As John Maynard Keynes (without historical exaggeration) said in his *Treatise on Money* (1930), "This right is claimed by all modern States and has been so claimed for some four thousand years at least.[3] It is when this stage in the evolution of Money has been reached that Knapp's Chartalism – that money is peculiarly a creation of the State – is fully realized."

MMT as fiat money theory could certainly stand alone without using Chartalism as a crutch – better to rely on Kublai Khan, Weber, and Keynes than Knapp.

---

[1] From the Latin word *charta* meaning paper. Paper money can represent debt. Georg Friedrich Knapp is usually credited for creating chartalist doctrine.

[2] An English-language version of Weber's 1919 essay on "Politics as a Vocation" appears in Waters and Waters (2015).

[3] The Sumerians before 3000 BC used a coin called a *shekel* (*she* = wheat, *kel* = bushel) which exchanged for wheat and could be used for access to temple prostitutes serving the fertility goddess Inanna. The temple priests controlled the transactions.

Macroeconomic perspective

Before getting into the details of functional finance, it makes sense to recall an old-fashioned way to think about macroeconomic decision making. Dating back at least to a pamphlet by Jan Tinbergen (1952) economists draw a distinction between "targets" and the "instruments" policy-makers aim at them. The difference between the two is not clear-cut. As will be seen, instruments can respond to targets as well as the other way `round or both may be driven by other forces. Regardless, Tinbergen's classification is an initial guide to thought.

The column headings in Table 1 below show seven targets which enter current debate. Tinbergen pointed out that in practice there are often more targets than instruments, so that all policy goals are unlikely to be achieved.[4] In closed economy macroeconomics, monetary and fiscal policies are the instruments usually considered. Inflation and levels of economic activity or (un)employment are targets. They are often folded together in a Phillips curve hypothesis that "current" prices of goods and services grow exponentially as output and employment increase relative to "capacity."

The lack of empirical robustness of the Phillips curve has been lamented for decades. It is adopted below in discussion of structuralist inflation, but for now "stable output" and "stable inflation" are treated as separate targets. Numbers can be attached, e.g. two percent inflation and a four percent unemployment rate. The standard indicator for monetary policy is a short-term interest rate set by the Federal Reserve, and the Federal government's budget deficit (usually positive) stands for fiscal policy.

[4] Structuralist inflation with more instruments than targets is discussed below.

Although they matter greatly in practice, for the moment ignore institutional difficulties in applying the instruments. The fiscal deficit is not set as "policy" in the USA. It emerges from a slow, cumbersome political process involving the President and Congress; the "independent" Fed is often politically constrained in its decisions. There are also questions, taken up below, about effectiveness and potential adverse effects of changes in the interest rate.

An issue immediately arising in the Tinbergen framework is how to "assign" the instruments – should the authorities use fiscal measures to (try to) control output, and the interest rate to regulate inflation or vice-versa? These questions stand out in "functional finance," a Keynesian view of the world introduced by Abba Lerner (1943).[5]

Functional finance

Table 1 sets the contemporary macroeconomic stage. Besides output and current price inflation, other potential targets are listed across the top. It is not clear that a booming stock market and rising prices for housing should be treated as policy goals, but asset price inflation certainly enters contemporary discussion. Similar observations apply to income equality and environmental quality. Ratios to GDP of fiscal debt and net foreign assets (negative for the USA) merit consideration. These extensions are discussed below.

[5] Lerner was a versatile economist. Among other areas, he made big contributions to international trade and national planning theories.

Table 1: Targets vs instruments

	Output	**Current price Inflation**	**Asset price inflation**	**Income equality**	**Change in fiscal debt ratio**	**Change in net foreign assets ratio**	**Enviro. quality**
Functional finance							
High interest rate	↓	↓	↓		↑	↑	
High fiscal deficit	↑	↑	↑		↑	↓	
Progressive MMT							
High interest	↓	↓	↓		↑	↑	
High deficit	↑	↑	↑	↑	↑	↓	↑
Incomes policy	↑	↑		↑			
Regulatory policy				↑			↑

In the context of Table 1, functional finance became American "Keynesian" orthodoxy through the Kennedy-Johnson years. The key was that fiscal policy should be programmed to maintain full employment, i.e. the authorities can tax and spend to regulate output and employment generated by aggregate demand. MMT adds that abetted by the central bank they can create money by boosting spending or reducing taxes, or annihilate it by raising taxes or redeeming debt. In principle, these moves can regulate the rate of interest.

The functional finance rows in Table 1 illustrate the implications as usually understood, with arrows pointing up or down to signal the direction in which targets are supposed to move in response to increases in the instruments. Allegedly, a high interest rate cuts into output and current price inflation. By increasing the cost of borrowing it slows asset price inflation and

speeds the accumulation of fiscal debt. Higher interest may induce an international portfolio shift away from foreign toward domestic financial liabilities (think of Treasury bonds), and so raise the growth of net foreign assets.

To an extent, loose fiscal policy or higher government net borrowing (the accounting details are presented below) affects the economy the other way – the arrows mostly point in the opposite direction from those for high interest rates. The exception is the change in fiscal debt which increases with more borrowing (again see details below). Net foreign assets will fall with bigger imports induced by expansionary policy.

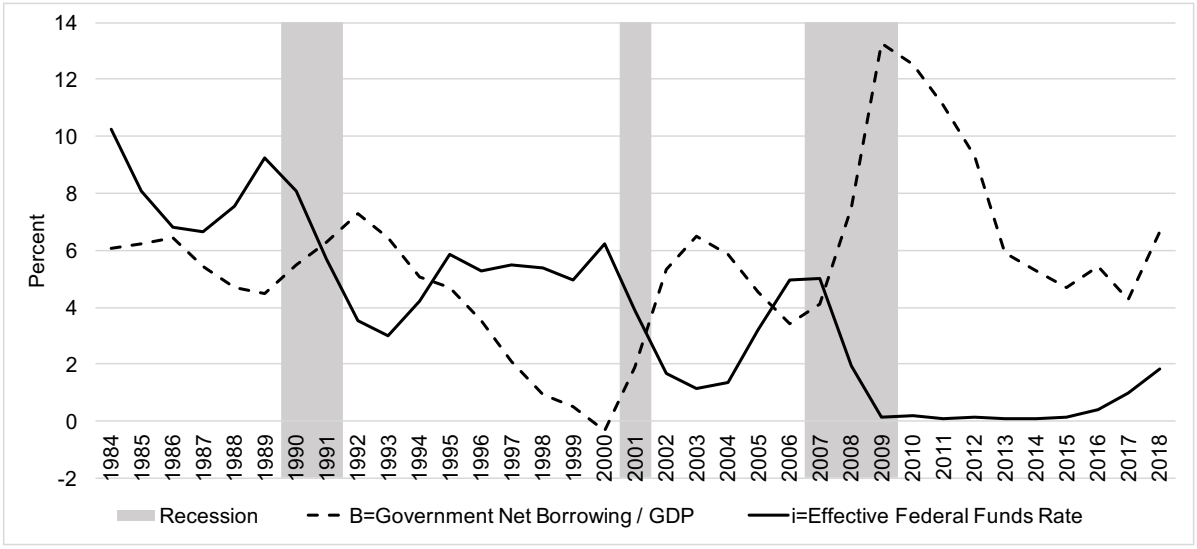
On Phillips curve assumptions, J. W. Mason and Arjun Jayadev (2018) propose a neat dynamic model to analyze dynamics of fiscal debt and inflation. The timing is complicated because inflation and *changes* in debt are "fast" variables that move in the same time frame (quarterly or monthly in the data) while the "slow" debt *level* may not stabilize for years or decades. Here their approach is transposed to inflation and economic activity which vary rapidly. Both are intrinsic to the business cycle, and merit examination for that reason alone.

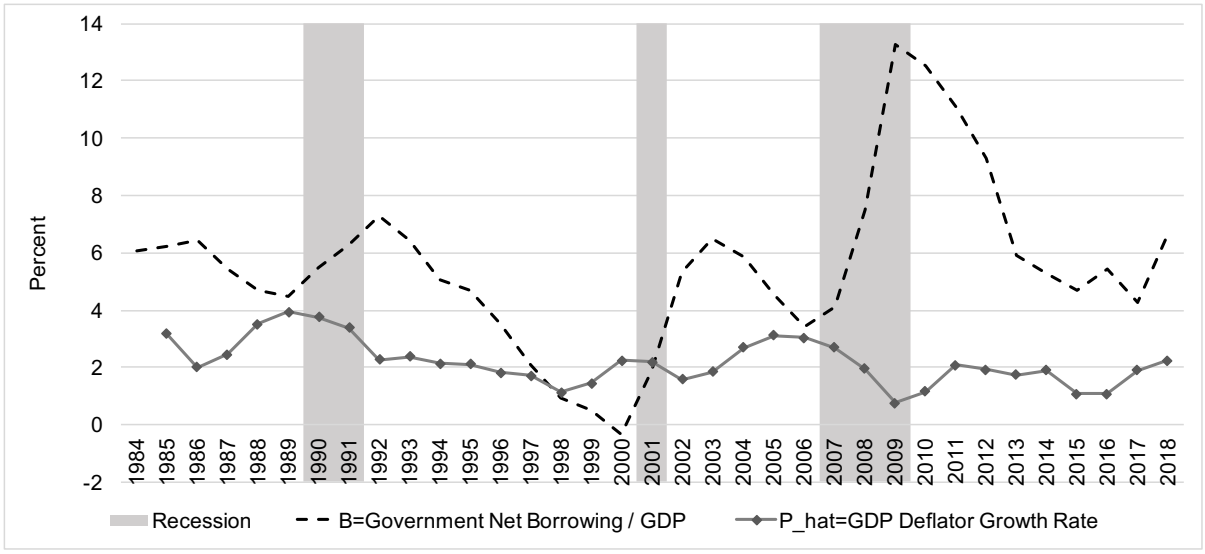
Business cycle data

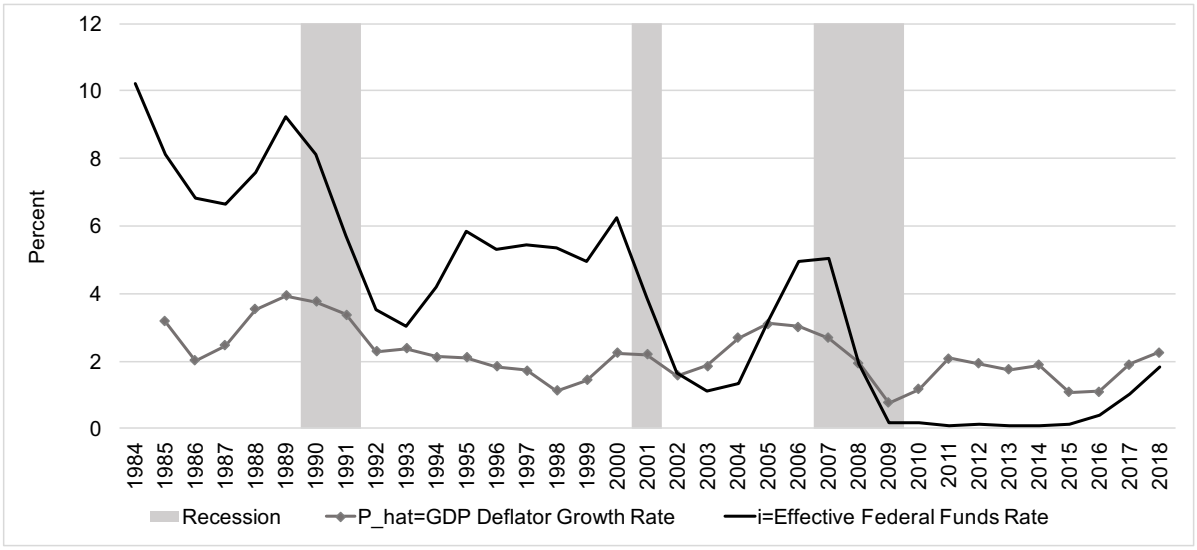
Figure 1 presents the data graphically. In the upper diagram, the ratio of government borrowing to GDP rises for a few years during and following recessions (shaded) and then tails off. The range of variation is wide, from slightly negative in 2000 to 13% in 2009. When it swings upward, the borrowing ratio can change substantially, by six percentage points after 2001 and nine points after 2007.[6]

Figure 1: Government borrowing, Fed funds rate, and GDP deflator inflation (with NBER recessions shaded)

[6] The Trump tax cut of 2018 added a couple of points to the ratio. The effects were modest. Real GDP growth was 2.9% in 2018, up 0.7% from the 2.2% rate in 2017.


Percent
Recession
B=Government Net Borrowing / GDP
i=Effective Federal Funds Rate


Percent
Recession
B=Government Net Borrowing / GDP
P_hat=GDP Deflator Growth Rate


Percent
Recession
P_hat=GDP Deflator Growth Rate
i=Effective Federal Funds Rate

This counter-cyclical borrowing is mostly due to "automatic stabilizers" (lower tax collections, and higher fiscal transfer payments built into existing programs) as economic activity slows. At times the stabilizers are accompanied by "discretionary" policy shifts such as the Obama stimulus package in 2009. Their role was foreseen by Lerner, who argued that "…Functional Finance provides a simple, quasi-automatic response" to recessions. In the USA, automatic responses were put into place circa 1945-60, with theoretical elaboration going hand-in-hand.[7] The stabilizers illustrate how the distinction between targets and instruments gets muddled.

Also, in the upper diagram, the short-term Federal funds interest rate increases leading into and even during recessions before it goes down. There is a downward trend in the interest rate, from over ten percent in 1984 (the economy was still working through the effects of the Fed's 1980 anti-inflation interest rate shock treatment) to close to zero after 2009 in the wake of the financial crisis.

In the middle diagram, inflation of the GDP deflator (a very broad price index) and government borrowing don't show much of a relationship. There is a downward trend in inflation, from four to two percent.

Finally, in the bottom diagram, both the interest and inflation rates trend downward. This positive correlation, enforced by bond markets, is not surprising. As discussed below (see Figure 4), the mark-up of prices over labor cost is fairly stable and wage growth has been trending downward for almost 50 years. In other words, the slope of the curves in the bottom diagram is broadly explained by wage repression (Taylor, 2020), a strong outside influence. Slower wage inflation brings down price inflation, which pulls interest rates along with it.

[7] Norman Keiser (1956) reviews the history.

Cyclical dynamics

The time paths of the variables in Figure 1 can be explored a bit further by using a "phase diagram," a representation invented by physicists in the late 19th century and taken up by economists a few decades ago. Figure 2 presents a diagram for government borrowing (horizontal axis) and the interest rate (vertical axis).

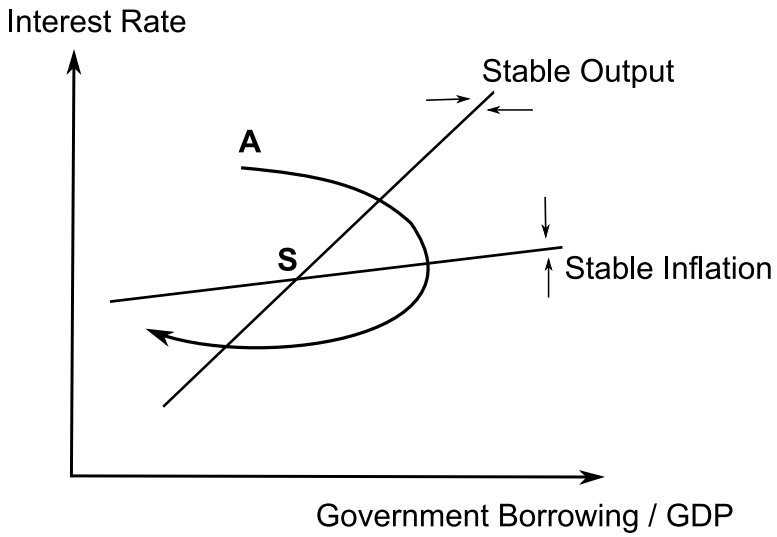
The upper panel in Figure 1 suggests that the instruments have offsetting relationships with economic activity. Coming out of a recession, for example, borrowing rises and the interest rate falls. Hence to assure "Stable output" along the schedule in Figure 2, both instruments have to go up or down together.

Relationships for inflation are less clear. Dogma asserts that a higher interest rate will lead to lower inflation.[8] The middle panel in Figure 1 suggests that there may be a weak positive association between government borrowing and the rate of price increases. Along the "Stable inflation" schedule, therefore, the instruments again would have to move together. The schedule's shallow positive slope in Figure 2 reflects the weak association between fiscal expansion and inflation.

As noted above, the Tinbergen framework presents an "assignment problem." How should the instruments be deployed to try to reach the targets? Functional finance and MMT suggest that fiscal policy should be used to control economic activity. If unemployment is too high, for example, there should be a fiscal stimulus. The horizontal

[8] The association is loose at best. The Fed's 1980 shock treatment is an example of stabilization of high inflation by high interest rates and wage repression, but the correlation does not hold in other circumstances.

Figure 2: Phase diagram for fiscal and monetary policy under functional finance

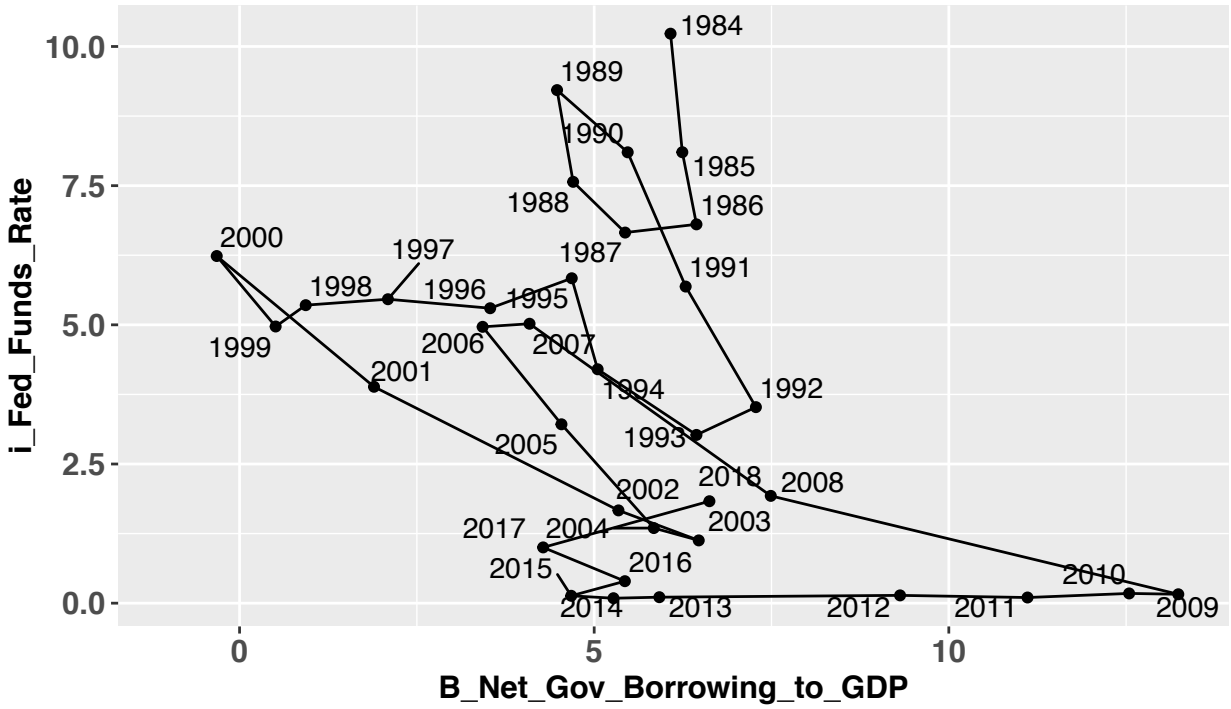


arrows near the Stable Output schedule represent this choice. Similarly, the vertical arrows near the Stable Inflation schedule show that monetary policy is assigned to inflation.

Suppose that initially both economic activity and inflation are low, as at point A in the diagram. To get back toward a stable equilibrium, government borrowing should be increased and the interest rate reduced. After the trajectory crosses the Stable output schedule, borrowing should be stabilized; eventually the interest rate should increase.

In general, the analysis suggests that adjustment paths should follow clockwise patterns around the overall stability point at S. In practice, of course, the schedules in Figure will always be shifting in response to many forces. Nevertheless, Figure 3 suggests that the Figure 2 pattern persists. There is clockwise movement after the recessions in 1990-91, 2001, and 2009 (the latter after automatic stabilizers and the Obama stimulus boosted borrowing in 2008).

Figure 3: Empirical "phase diagram" for government borrowing and the interest rate



Implications for MMT

Functional finance incorporating automatic stabilizers is the epitome of fiscal Keynesian. Often the stabilizers replace discretionary fiscal policy. In exceptional circumstances, more direct action may be required, as in China's expansionary moves in response to the global financial crash. But also recall how President Obama could only get a wimpy underfunded stimulus package through Congress.

It is also true that trying to use the interest rate to stabilize inflation is ineffective. The underlying loanable funds theory does not apply in the contemporary institutional set-up (Taylor, 2017 and 2019; Storm, 2019). Low interest rates, moreover, lead to high asset prices and the sort of speculative frenzy that provokes financial crisis. Simply assigning the interest rate to deal with current price inflation ignores these problems and becomes a dead end.

MMT's counter-cyclical policy innovation is a "job guarantee." A low-end version would use government funding to offer a minimum wage to workers thrown out of jobs by recession. They could work in the public sector or in publicly funded NGO or private sector activities.[9] In round numbers, suppose that with associated costs such as contributions to Social Security included, the wage is $30,000 per year ($15 per hour for 1800 hours worked, plus other costs). A hefty four percent decrease in employment would mean roughly six million jobs lost. Recreating these jobs by the guarantee would cost $180 billion, or about 0.9% of GDP. In terms of aggregate demand, the job guarantee would be a modest supplement to the stabilizing mechanisms already built into the system -- just recall the far larger post-recession increases in government net borrowing in Figures 1 and 3. MMT's policy suggestion does not go far beyond Keynes, Lerner, and the bevy of economists and legislators who created the existing automatic stabilizers.

Accounting for aggregate demand

The third foundation for MMT is internally consistent macroeconomic accounting. A useful way to analyze output determination is in terms of "net borrowing," or flows of spending minus income for broad economic groupings such as the government, private, and foreign sectors. We have already encountered government net borrowing. The relevant external flows are domestic exports minus imports. Thinking in terms of net borrowing or lending was promoted by the late British economist Wynne Godley. Despite distaste for calling a fiscal deficit "borrowing," MMT economists view Godley as a founding father.[10]

---

[9] The New Deal's Works Progress Administration immediately comes to mind. At its peak in 1938, the WPA and related programs enabled the government to employ three million people or 5.5% of the labor force (ten million remained unemployed). Stoop labor was more prevalent 80 years ago than now. The contemporary equivalent would be personal care services.

[10] Godley's ideas including net borrowing are reviewed in Taylor (2008).

Consistent macro accounting balance makes sure that the sum of borrowing levels across sectors must equal zero. If a sector's net borrowing is greater than zero, it is contributing positively to aggregate demand. If its borrowing is negative, it is a net lender reducing aggregate demand. Changes in sectoral borrowings shift the volume of economic activity.

A simple accounting scheme or toy model to determine real output X takes the form

(1) $(I - sX) + (G - tX) + (E - mX) = 0$

This equation says that demand "injections" minus "leakages" must sum to zero. Injections are real private investment I, government spending on consumption and capital formation G, and exports E. Leakages are private saving sX, fiscal receipts from taxes net of transfers tX, and imports mX. As will be seen, the leakage rates $s, t,$ and m may or may not be stable over time.

It is easy to solve (1) for to get

(2) $X = (I + G + E)/(s + t + m)$.

The leakage rates enter into a multiplier $1/(s + t + m)$. Output emerges in (2) as total injections times the multiplier. Sectoral net borrowing shares of output are $B_p = I/X - s$, $B_g = G/X - t$, and $B_f = E/X - m$. Equation (1) can be restated as

(3) $B_p + B_g + B_f = 0$.

It makes sense to see how net borrowing fits into the US economy. Table 2 presents the numbers for 2007, 2009, 2017, and 2018 along with the impacts of an MMT-style fiscal stimulus. The first two years illustrate how changes in net borrowing affected the system during the Great Recession. The latter two show impacts of the Trump tax cut. Both episodes embody visible shocks. A progressive stimulus package would be a significantly stronger shock than Trump's.

The data show that the private sector swings between being a net borrower and lender. Its saving rate normally varies in the vicinity of 20%, and recently its level of investment has been comparable to government spending on goods and services. The government's tax-minus-transfer coefficient has varied significantly, and it is a consistent net borrower. The import coefficient is around 16%. The external deficit or net lending from the rest of the world has been in the range of 2.5% of GDP recently, implying that the ratio of exports to output is about 13.5%.

Recession and the Trump tax cut

The 2007-09 recession was precipitated by private sector retrenchment in wake of the financial crisis. Household consumption was flat, while investment fell by 30%. In turn, business retained earnings went up, meaning that the overall private saving rate rose from 18% to 22%. Output went down by 3%. It would have dropped much more if the net government tax rate had been stable. But in fact the rate fell from 16% to less than 10% due to automatic stabilizers and the Obama stimulus package of around 5% of GDP. The overall impact was that private net borrowing fell by 10.7% of output while government borrowing went up by 8.3%. Reduction of the external deficit by 2.4% made up the difference. For reasons discussed below the fiscal deficit of 12.4% of GDP was probably unsustainable, but it dropped to around six percent by 2013.

Table 2: Net borrowing behavior in the USA for selected years and a progressive stimulus package (levels are in trillions of dollars at prices of 2012)

	2007	2009	2017	2018	Stimulus
X	15.58	15.13	18.12	18.77	20.73
I	2.65	1.87	3.25	3.47	3.47
s	0.181	0.222	0.209	0.224	0.240
B_p	0.009	-0.098	-0.030	-0.040	-0.073
G	3.15	3.33	3.14	3.19	3.85
t	0.161	0.096	0.118	.104	0.074
B_g	0.041	0.124	0.055	0.066	0.112
E	1.82	1.93	2.50	2.55	2.55
m	0.168	0.153	0.163	0.162	0.162
B_f	-0.050	-0.026	-0.025	-0.026	-0.039
Multiplier	2.041	2.123	2.041	2.041	2.100

Source: National income and product accounts and own calculation

In sum, the recession was not a disaster because of a major fiscal realignment. Causality ran from a private sector shock to automatic and discretionary government responses. It went the other way for the more modest Trump tax cut. The tax rate fell from 11.8% to 10.4%, or about $250 billion. Output did go up by 3.5%, but the increase would have been greater if there had been a strong private sector investment boom instead of a $220 billion increase. Lower business taxes were in part distributed via dividends and share buybacks to households at the top of the income ladder with high saving rates. In terms of demand leakages, higher private saving fully offset lower taxes.

Progressive stimulus

Already in the 1930s, Keynes and Michal Kalecki (1971) understood that movements in effective demand determine how output and employment shift. MMT carries their insight.

Examples in Table 2 are the expansionary MMT program illustrated in the "Stimulus" column and the 2007-09 recession in which higher saving along with lower investment generated a contractionary shock amounting to 9% of GDP.

MMT proposals bring other instruments into the picture. Two show up in the "Progressive MMT" section of Table 1. "Incomes policies" such as interventions to empower labor in job markets and regulatory changes to address environmental problems are part of the package.

After guessing at the magnitude of expansionary fiscal intervention, we can consider possible consequences. Three of them – inflation, a rise in government debt, and foreign complications – could threaten success. Known risks may not be extreme, but they certainly exist. (Of course, unknown unknowns can always arise.)

Fiscal moves that have been discussed in connection with MMT include attacking climate change, expanding Medicare, and reducing college tuition. Fully mitigating CO_2 emissions might require an outlay of more than five percent of world GDP initially, gradually dropping to around two percent (Rezai, et. al. 2018). Some Green New Deal proposals run in the range of eight percent. Somewhat arbitrarily, we assume that government environmental spending in 2012 prices would increase by $380 billion or 3.5% of GDP. By way of comparison 2018 military spending was three percent of GDP.

Medicare is basically a fiscal transfer program. Free college tuition could be another. If enhanced Medicare brings 20 million people into the health care system at $15,000 each, the cost would be about 1.5% of GDP or $280 billion. Reduced tuition might cost roughly the same. The total would be three percent of GDP.

Raising transfers by that amount would cut the 2018 (net of transfers) tax rate t from 0.104 to 0.074. Offsetting factors which cut into an increase in demand should also be considered. Reductions in household borrowing now paying for medical services and tuition could conceivably boost the private saving rate s from 0.224 to 0.24.

Other things remaining equal, demand injections from the package would sum to 9.87 trillion dollars and the multiplier would be 2.1. The upshot would be an increase in output of 20.73 trillion dollars, a rise of 10.4% over 2018.[11] Government net borrowing as a share of output would increase from 6.6% (post-Trump) to 11.2%, a fiscal deficit big enough to set off alarm bells. More government borrowing would have to be balanced by greater net lending of 7.3% from the private sector and 3.9% from abroad (a 50% increase in the external deficit). The expansionary shock would be close to five percent of output, not as large as in the 2007-09 recession but in the opposite direction.

In the short run, such a large demand surge by the government may be unlikely. One can ask, however, about possible effects of a robust expansionary package on inflation, the fiscal position, and external balance.

Inflation

Here is the empirical background. Annual growth of the consumer price index (CPI) in the USA peaked at 13.5% in 1980, provoking savage monetary tightening as the Fed funds rate was boosted to 19% in mid-1981.[12] The shock treatment pushed CPI growth down to 1.9% in

[11] Other guesstimates of the size of a package come out in the same ballpark, e.g. Palley (2019).
[12] "Savage" relatively speaking. Transition and developing economies have been subjected to far stronger bouts of shock therapy.

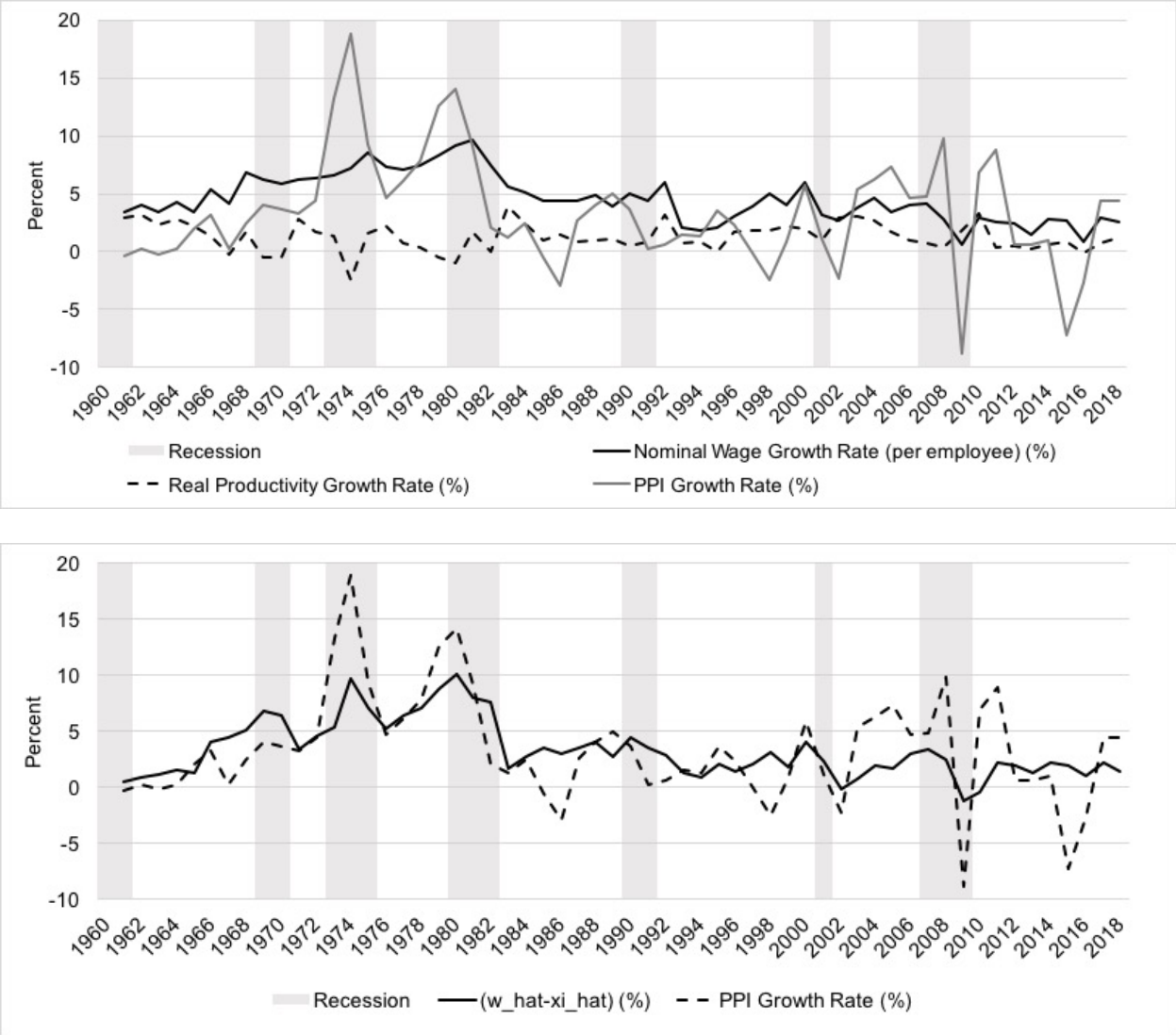
1986. After an upward excursion to 5.4% in 1990 it drifted downward to fluctuate above and below 2.5% ever since.

Figure 4 illustrates inflation dynamics over almost 60 years. The growth rate of nominal unit labor costs is the difference between growth rates of nominal wages and labor productivity. The lower diagram shows how both cost and a producer price index (PPI, signaling pricing decisions of firms) rose leading into the monetary shock. Growth of both indexes dropped sharply during the subsequent recession, with negative growth of the PPI in the mid-1980s. Thereafter both growth rates declined, with the PPI generally rising more rapidly than labor cost (the drops in producer prices in 2010 and 2015 were due to collapsing energy costs).

Over the long haul, profits gained as the share of wages in value-added fell at around 0.4% per year for almost five decades. The trend is driven by institutional wage repression (Taylor, 2020).[13] Peak growth rates of nominal wages have gone down by seven percentage points since the 1980s (upper diagram), pulling down price inflation. Wage repression is often built into contractionary macroeconomic shocks, but is especially insidious in the USA because it is so long-standing. Small wonder that reducing inflation has vanished from economic policy debate. How to *increase* inflation is the monetary policy topic du jour.

[13] Alternative microeconomic explanations stress producers' "monopoly" power, but they lack empirical support. The key problem is that micro level observations do not generalize readily to macro level wage suppression (Taylor, 2020, chapter five).

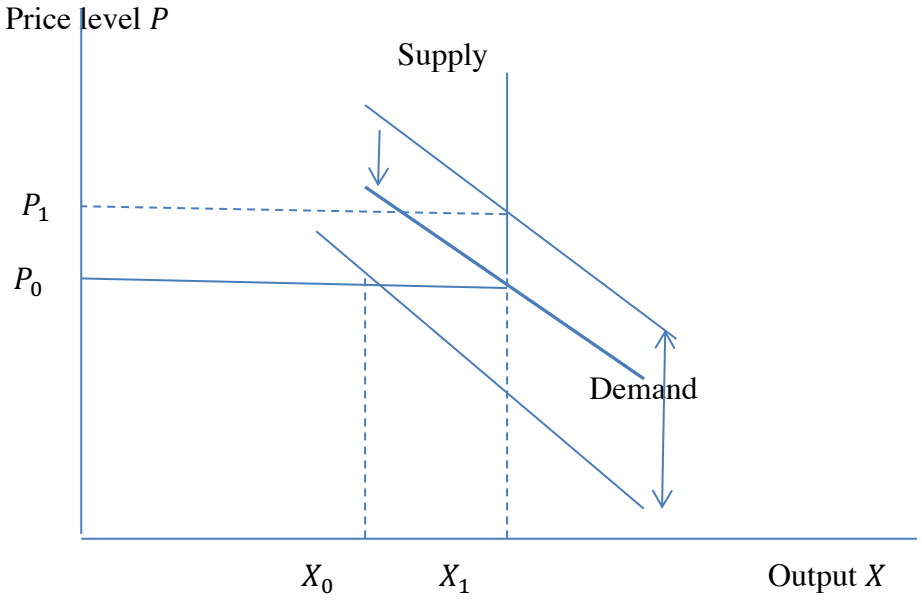
Figure 4: Wage and price inflation rates



Simple inflation theory

To understand what is happening, we need a theory of inflation. Around the turn of the 20th century the Swedish economist Knut Wicksell pointed out that inflation is a "cumulative process" involving feedback between price and wage inflation rates. Even after their long decline, labor payments make up 55% of production costs and have to enter the inflation equations.

Figure 5: Price level determination



The simplest MMT story ignores Wicksell. Figure 5 is an illustration of how the price *level* (*not* the growth rate of prices, or inflation) might be determined. The key assumption is that the nominal cost of production (a mark-up on the money wage) is constant when output is below the "full capacity" level X_1. A relatively low level of demand will peg output at X_0 and the price at P_0. Higher demand will collide with the capacity limit and force the price to rise to P_1, raising profits and reducing the labor share. MMT discussion circles around the question as to whether a stimulus package will lead prices to jump as in Figure 5.

This model violates the macroeconomic accounting restrictions that MMT doctrine highlights. If output cannot exceed capacity, then some mechanism must force the demand schedule to slide downward to the kink in the supply curve, as shown by the heavy line in the diagram. Two show up in the literature.

The "real balance effect" (or the "inflation tax" in a dynamic version) says that a jump in the price level will reduce the real value of assets with prices fixed in nominal terms – money is

the usual example. Wealth is eroded and households are supposed to save more as a consequence.

"Forced saving" happens when a price jump against a constant money wage reduces real payments to wage-earners. If their capacity to borrow is limited, they have to cut consumption, sliding the demand curve downward. Given the wage lag shown in Figure 2, this linkage matters more than real balances.[14] If an expansionary package does drive up the price level, middle class and low income households who rely on wages would be the ones to suffer.

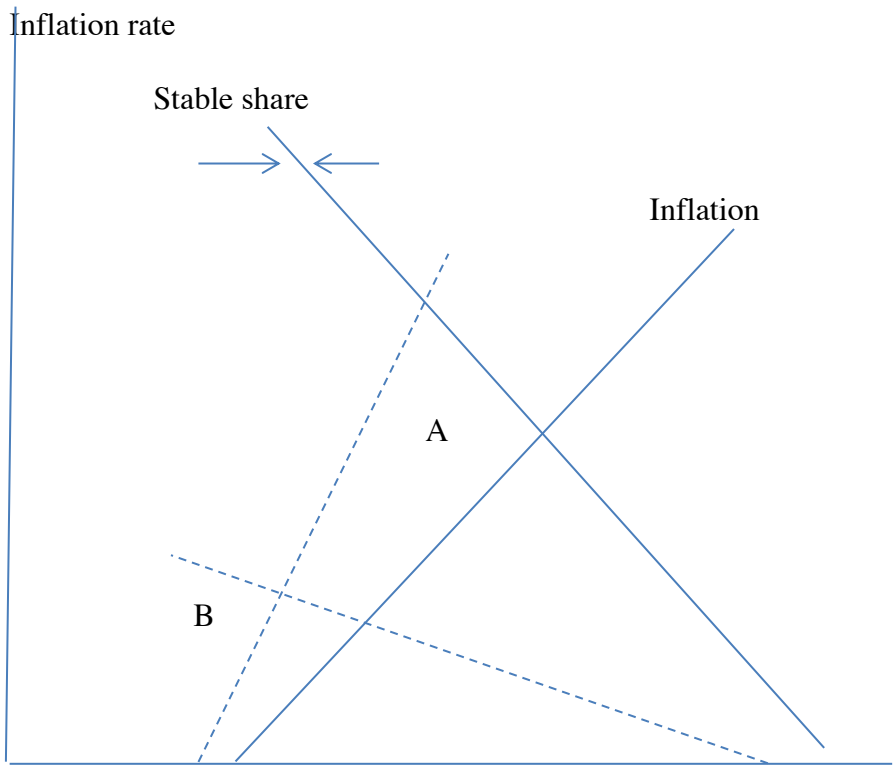
Forced saving and the inflation tax strongly influence attempts at stopping high (or hyper-) inflation, which do not always succeed. They may involve introduction of a new currency at a fixed foreign exchange rate, removal of contract indexation (especially for wages) to price increases, and capital inflows to offset a consumption boom caused by elimination of the demand-reducing effects of inflation. The state must back all such drastic moves. Chartalism's obsession with taxes (often higher in real terms after stabilization because payment lags no longer matter) is of secondary importance, a blind spot which carries over in MMT.

Structuralist inflation

The model of Figure 5 can be extended to more plausible structuralist or "conflicting claims" inflation. There are two instruments – price increases which are controlled by business, and the money wage which is subject to bargaining between business and labor – and only one target which can be taken to be the wage share. The excess of instruments creates conflict.

[14] The famous real balance effect, much touted by Neoclassically inclined economists, is irrelevant today. A broad monetary aggregate is around $6 trillion, or six percent of household wealth. The propensity to consume from wealth is around four percent so a small decrease in real balances will have a negligible impact on consumption demand.

Figure 6: Inflation dynamics



In an inflationary macroeconomic environment, business can respond rapidly a higher wage share of output by increasing the rate of price increases in Phillips curve fashion along the "Inflation" schedule in Figure 6. Money wages on the other hand are not immediately indexed to price inflation so that they will follow with a lag. At the same time, labor will push for faster wage inflation when the wage share is low. A "Stable share" schedule with a negative slope will emerge from this process. There is an initial macro equilibrium at point A, with adjustment of the wage share toward the stability schedule (small arrows).

By stimulating aggregate demand, higher fiscal borrowing B_g would shift the inflation locus upward (dashed line) with more rapid inflation and a lower wage share in macro equilibrium along the initial Stable share curve.

Alternatively, under wage repression, the ability of workers to support a high wage share could be curtailed. The stability schedule would shift downward (or to the left). Both inflation and the wage share would fall. There could be a new equilibrium at point B with higher fiscal demand, less inflation, and a lower wage share. Wage repression would ratify expansionary policy under MMT or any other fiscalist doctrine.[15] Going the other way, the Table 1 target of improving distributional equity through institutional change to enhance labor' bargaining power could worsen the risk of current price inflation.

Between 1990 and today, Figure 4 shows that the US annual inflation rate fell from around 5.5% to 2.5%. Meanwhile the labor share of value-added fell by about five percentage points. Roughly speaking, the reduction in inflation was in the range of one-half of the fall in the labor share. Nelson Barbosa's (2014) econometrics based on a more sophisticated version of Figure 6 suggests that the factor could be closer to one-third. Going the other way, the implication is that a higher labor share would provoke faster inflation, perhaps making the Fed's goal of a two percent rate easier to reach.

Debt

It is just an illustrative number, but in many circles the 11.2% ratio of the fiscal deficit to GDP in Table 2 would be considered excessive. It would cumulate into debt. Whether the debt would be sustainable is the immediate question. Evsey Domar (1944) pioneered government

[15] MMT literature at times argues that inflation could be attacked by raising taxes to cut into aggregate demand. Aside from practical difficulties with discretionary policy, the tax increase could work against the rationale for the Table 2 stimulus.

deficit and debt accounting. There is a "Domar condition" for sustainability which states that the ratio of debt to GDP will not explode if the output growth rate (g) exceeds the real interest rate (j) .[16] The "growth factor" g has to exceed the "leakage factor" j for the dynamics to be stable. Recently, the US growth rate has been in the vicinity of 2.5%. The real medium-term borrowing rate on Treasury securities is around 0.5% so the Domar condition is satisfied.[17] But there can be pretty rapid debt expansion involved.

In algebra, let δ be the ratio of fiscal debt to GDP. Its increase over time is

(4) $d\delta/dt = \dot{\delta} = B_g - (g - j)\delta$.

The debt ratio is now around 1.05, up from 0.63 in 2007, in wake of the financial crisis.

With the current numbers,

$\dot{\delta} = 0.112 - 0.02 \times 1.05 \approx 0.09$

so the ratio is rising at 9% per year, fast enough to reach 1.6 in five years and 5.6 in the long run.

Just who is to absorb such rapid expansion of Treasury securities? The Fed now holds just 15% of the total – private bondholders take up the rest. They would not tolerate nine percent growth indefinitely. MMT proposes offsetting bond purchases by the central bank [18] The Bank of Japan (BOJ) provides an example. It now holds around 50% of outstanding government bonds, up from 8.5% in 2011. The fiscal deficit as a share of GDP declined from 11% to 6% over the period.

[16] In fact, the condition was first noted in the 1950s by World Bank staffers applying Domar's accounting.
[17] If under MMT rules fiscal policy is being used to regulate aggregate demand, then presumably the Fed could adjust the interest rate to assure that the Domar condition is well and truly satisfied.
[18] Other options for draining liquidity such as permitting deposits at the central bank could also be explored.

Laffer curve logic applied to open market operations suggests problems with this strategy. If the central bank holds no Treasury securities, it cannot sell them to drive down bond prices and raise the interest rate. If it holds the entire supply, it cannot buy to reduce the rate. Holding an increasing share of a rapidly growing bond supply puts the Bank of Japan into a bind. Net selling against rapid supply growth could be difficult, meaning that the BOJ could not raise Japan's ultra-low interest rates even if it wanted to.

External balance

Somewhat similar considerations apply to the external deficit in Table 2 of 3.9% of GDP or $808 billion. Outstanding Treasury debt held abroad is $6.4 trillion. A potential run against the dollar could not change this total by very much because there is no large-scale alternative global asset. MMT emphasizes how the American economy is protected from external shocks because it can borrow from the rest of the world in terms of its own currency.

This protection, however, is not invincible. Foreign exchange risk is unavoidable, even for the almighty dollar. There are financial instruments besides American liabilities available in the world market. A visible portfolio shift against Treasury debt would have to be met in one of two ways (or a combination).[19] If the interest rate is held constant, the exchange rate expressed as dollars per euro, renminbi, yen, or ounce of gold would have to depreciate or rise. The US import coefficient is only 16%, but if prices of key imported consumer commodities were to jump upward, the impact could provoke inflation (especially if the Stable share schedule in Figure 4 were to shift upward).[20] On the other hand, if the Fed intervened to stabilize the exchange rate,

[19] For a Godley-esque presentation see Taylor (2008).

[20] The Scandinavian inflation model (Aukrust,1977) was set up for an economy with a high productivity traded goods sector (in terms of both level and growth) and a non-traded sector with low productivity. The productivity differential means that the domestic terms of trade would trend toward the latter. An

then the interest rate would have to increase to draw in foreign funds, potentially cutting effective demand. Either reaction would be a threat to the stimulus in Table 2.

Finally, effects of trade wars are unlikely to be crucial macroeconomically but could have unpredictable effects depending on market psychology. The US economy is not very open to international trade. As noted above, import and export ratios to GDP are around 16% and 13.5% respectively (corresponding to flows of around $3 trillion and $2.5 trillion). In response to changes in tariffs and the exchange rate, a shift of ten percent in either flow would be improbably large on its own terms. The macro impact would be on the level of the Trump tax cut, not overwhelming in the short run but with longer term repercussions on net foreign assets. As observed above, impacts on inflation would be muted unless the Stable share schedule in Figure 6 shifted upward.

Bottom lines

Expansionary policy with a strong redistributive component is an attractive proposal. Not discussed here, for example, is the fact that higher output and real wages would likely stimulate productivity growth. Global warming can and should be attacked seriously.

With regard to foundation myths for MMT, Chartalism adds little to the observation that a modern macro economy operates on the basis of fiat money supported by state power which transcends enforcing the mere payment of taxes.

---

inflationary shock, say from continued devaluation, in the former could generate price inflation between the two. A wage inflation response could then set off a cumulative process. The sectoral structure of the US economy can increasingly be described in terms of this model (Taylor, 2020), but at the moment with weak labor power.

Functional finance is the heart of fiscalist Keynesianism incorporating automatic stabilizers for the business cycle. The MMT job guarantee proposal could be helpful as a supplement to the existing system of stabilizers.

Discretionary fiscal expansion in the range being discussed might increase output by more than 10%, the fiscal deficit by 70% and the current account deficit by 50%. No doubt the Fed could buy Treasury securities to offset an ongoing deficit of 11% of GDP but the Bank of Japan example suggests that there is a time-limited window for such interventions.

A fiscal expansion poses the risk of price inflation. It is unlikely to turn into a Wicksellian cumulative process so long as wages are repressed. But ending wage repression is presumably an MMT policy objective.

There could be an international portfolio shift against the dollar if a large current account persists. It would force an interest rate increase and/or dollar devaluation, both harmful to an MMT program. Barring big shifts in market psychology, tariff wars are not likely to have major macroeconomic impacts.

MMT's aims are exemplary but their intellectual support adds little to the ideas of Godley, Lerner, and Keynes. The doctrine blends them effectively but is certainly no striking new intellectual synthesis.

References

Aukrust, Odd (1977) "Inflation in the Open Economy: A Norwegian Model," Oslo: Statistisk Sentralbyrå.

Barbosa, Nelson H. (2014) "A Structuralist Inflation Curve," *Metroeconomica, 65*: 349-376.

Domar, Evsey D.(1944) "The 'Burden of Debt' and the National Income," *American Economic Review, 34*: 798-827.

Kalecki, Michal (1971) *Selected Essays on the Dynamics of the Capitalist Economy, 1933-1940,* Cambridge UK: Cambridge University Press.

Keiser, Norman F. (1956) "The Development of the Concept of 'Automatic Stabilizers'," *Journal of Finance, 11*: 442-441.

Keynes, John Maynard (1930) *A Treatise on Money,* London: Macmillan.

Keynes, John Maynard (1936) *The General Theory of Employment, Interest, and Money,* London: Macmillan.

Lerner, Abba P. (1943) "Functional Finance and the Federal Debt," *Social Research, 10:* 38-51.

Mason, J. W., and Arjun Jayadev (2019), "A comparison of monetary and fiscal policy interaction under "sound" and "functional" finance regimes,"*Metroeconomica,* forthcoming.

Palley, Thomas (2019) "Macroeconomics vs Modern Monetary Theory: Some Unpleasant Keynesian Arithmetic," http://www.postkeynesian.net/downloads/working-papers/PKWP1910.pdf.

Rezai, Armon, Lance Taylor, and Duncan K. Foley (2018) "Economic Growth, Income Distribution, and Climate Change," *Ecological Economics, 146*: 164-172.

Storm, Servaas (2019) "Summers and the Road to Damascus," https://www.ineteconomics.org/perspectives/blog/summers-and-the-road-to-damascus.

Taylor, Lance (2008) "A foxy hedgehog: Wynne Godley and macroeconomic modeling," *Cambridge Journal of Economics, 32*: 639-663.

Taylor, Lance (2017) "The 'Natural' Interest Rate and Secular Stagnation: Loanable Funds Macro Models Don't Fit Today's Institutions or Data," *Challenge, 60*: 27-39.

Taylor, Lance (2019) "Central Bankers, Inflation, and the Next Recession," https://www.ineteconomics.org/perspectives/blog/central-bankers-inflation-and-the-next-recession.

Taylor, Lance (2020) *Macroeconomic Inequality from Reagan to Trump: Market Power, Wage Repression, Asset Price Inflation, and Industrial Declin* , New York: Cambridge University Press.

Tinbergen, Jan (1952) *On the Theory of Economic Policy,* Amsterdam: North-Holland.

Waters, Tony, and Dagmar Waters (2015) *Weber's Rationalism and Modern Society,* New York: Palgrave Books.