

Modern Money Theory

Why it can't work (and where it might)

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Key Points

- The article criticizes modern money theory (MMT), which is a macroeconomic policy that aims to achieve full employment by using money-financed fiscal deficits, without using any formal modelling.
- The article claims that MMT policy would not work in an open and internationally highly financially integrated economy, because it would either cause the money stock to grow unsustainably large or require domestic interest rates to be set at levels that would contradict the goal of full employment and create economic and financial instability.
- The article argues that MMT can only work, at best and if at all, in specific country circumstances, such as having high policy credibility or issuing an international reserve currency, which can prevent the negative effects of MMT policy and make expansionary demand shocks effective.

Preamble

A major criticism of modern money theory (MMT) is that it is unable to prove its claims, given the lack of formal modelling supporting the theory.² If a theory cannot be tested (formally or empirically), it cannot be falsified either.

This article takes the bull by the horns and counters MMT on its own ground: it disproves it without using formal models. In particular, the article addresses one of the main tenets of MMT whereby governments should print money and

¹ I wish to thank my wife Ornella for her unremitting support.

² See Drumetz and Pfister (2021). Notice the distinction between the terminology 'modern money theory,' which will be used throughout the article, and 'modern monetary theory,' often referred to in the literature and in commentaries on the subject. In the words of L. Randall Wray (2019), one of the leading MMT theorists, 'I will note here that I use the terminology Modern Money Theory—and have seen that usage as following on from the title of my 1998 book (*Understanding Modern Money*) ... However, many of my colleagues had used the other terminology Modern Monetary Theory. I object to that as it draws attention to the word "monetary" and leads many to believe it is all about monetary policy—while in reality much of the focus is on fiscal policy (and we argue that the traditional division between the two is highly misleading in any case). Further, it seems to conjure in some minds a similarity to Monetarism.'

finance public spending, both to eliminate unemployment (when aggregate demand is too low) and to maintain high levels of aggregate demand by keeping interest rates low.³ The article shows that MMT leads to unsustainable results, with only few exceptions (and these, too, within strong limits).⁴

Introduction

MMT argues that in any country where the public sector combines the central bank and the national treasury into one (consolidated) entity that issues the domestic currency, the government is financially unconstrained: it can always finance spending to induce full employment by printing the money needed. Also, because of this, it can never default on its obligations. Furthermore, according to MMT, taxes and bond offerings are not needed to fund the budget, but can be used to withdraw money from the economy in order to avoid that aggregate demand exceeds output and breeds inflation (Wray, 1998). As a corollary proposition, the interest rate is discarded as a tool of stabilization policy and the government should use bond offerings to set the overnight rate at (what MMT theorists regard as) its natural or normal rate of zero, allowing markets to factor in risk to determine credit spreads (Forstater and Mosler, 2005). As a further corollary, MMT considers floating exchange rates necessary to remove constraints on policy that compromise the government's capacity to maintain full employment (Mitchell, 2018).

MMT ignores, however, that in contemporary highly financialized and internationally integrated economies, the stocks of public sector liabilities issued by governments (money and debt), and the prices at which they trade in global markets, play a crucial role in determining key domestic macroeconomic variables such as aggregate output, resource employment, price inflation, and interest and exchange rates. Whether these liabilities consist of 'promises to pay' at some future dates (such as debt securities) or irredeemable representations of value used to settle transactions (such as fiat money), they all essentially embody claims on real resources.⁵ Therefore, their value reflects the credibility of their

³ Notice that, in this scheme, the monetization of fiscal deficits leaves total public debt unchanged by substituting reserves for government debt in the aggregate balance sheet of the central bank and the government.

⁴ The article is based on the results of my previous analytical study of MMT, where I show that the basic economic relationships of the theory can be rigorously represented in a stock-flow consistent ISLM open-economy model framework (Bossone, 2021).

⁵ The Accounting View Money (AVM) does not consider fiat money issued by the state as a liability of the issuing state, but as a special form of equity (Bossone and Costa, 2021). The AVM, however, does not question that state money as a form of equity is an asset that trades in the market at a market-determined price.

issuers, as perceived by the markets where they are traded; that is, their issuers' (proven or presumed) capacity to preserve their value over time. In today's globalized economies, not even full monetary sovereignty shields governments from the constraints that the market valuation of their liabilities poses on their monetary and fiscal policies, and no sound macroeconomic theory can ignore the effects of these constraints.⁶

This article is about MMT neglecting this realization and shows that, in the light of it, MMT cannot work as an effective and sustainable macroeconomic policy program aimed to achieve and maintain full-employment output through persistent money-financed fiscal deficits in economies suffering from Keynesian unemployment or underemployment, unless specific country circumstances hold (and even then, only up to a point). Such circumstances consist of cases where the economy enjoys very high policy credibility in the eyes of the international financial markets or issues an international reserve currency.

The article is organized as follows: the third section refers to the relevant literature; the fourth section builds an 'informal' model of MMT's basic macroeconomic relations; the fifth section applies the model to two hypothetical, identical economies that differ only for the degree of policy credibility that the markets attribute to them; the sixth section discusses the model's results; and the final section summarizes the article's main conclusions.

Relevant Literature

Noting that the most recent and complete illustrations of MMT are reported in Wray (2015), Mosler (2018) and Mitchell (2019), strong criticisms of the theory have been raised by several mainstream economists (notably among them, Krugman (2019) and Summers (2019)) as well as by economists from the same post-Keynesian background as MMT theorists (notably among them, Davidson (2019) and Sawyer (2019)). In a series of contributions by Palley (2013), recently subsumed in Palley (2020), these various critical arguments are discussed

⁶ Credibility lies at the core of the portfolio theory of inflation (PTI), which shows it to be a critical determinant of the (in)effectiveness of monetary and fiscal policies (Bossone, 2022). In a nutshell, according to the PTI (whose results inspire this article), international financial markets determine the value of all public sector liabilities of open and internationally highly financially integrated economies, including domestically denominated debts and currency. While anti-recessionary policies undertaken by credible governments are effective, those implemented by poorly credible governments cause markets to short their bonds and currencies, thus causing their value to fall. In response, policymakers may either correct nominal interest rates, though at the cost of dampening the expansion, or continue to push on the money lever in an attempt to support bond prices and sustain demand, yet only fueling capital outflows and depressing the (external and internal) value of the currency.

analytically, covering, *inter alia*, the macroeconomics of money-financed budgets, the selection of optimal targets and instruments,⁷ existing macroeconomic constraints on MMT policy and adverse policy feedbacks, the disingenuity about the role and necessity of taxes, the USA-centric thinking behind MMT, its unjustified dismissal of high inflation and default, and the downsides of its proposed employer of last resort or job guarantee program. The conclusion is that MMT underestimates the economic costs and exaggerates the capabilities of money-financed fiscal policy. Such criticisms were largely shared by a panel of distinguished economists whose opinions on MMT were recently surveyed (IGM Forum, 2019).

Criticisms of MMT have been addressed by Tymoigne and Wray (2013), while PERI (2012) reports contributions from MMT proponents and opponents, and similarly, RWER (2019) collects a series of works from both camps.

The discussions contained in the above references consider all major aspects of MMT. There are simply too many to be summarized here, and summarizing them would transcend the scope of this article, which focuses instead on the one specific—yet foundational—aspect of MMT that was introduced in the second section: the effectiveness and feasibility of MMT policies in achieving and sustaining full employment in the context of asset market (dis)equilibria, conditional upon the credibility of the governments issuing money. While some important elements concerning this aspect have been raised by Palley (2020) and Sawyer (2019), they have not been analytically addressed as this article purports to do.

Modeling MMT ‘Informally’

Since the objective of this study is to show that MMT’s inconsistencies emerge from the way macro policy shocks interact with the basic structural economic relations assumed by the theory, but without resorting to formal modeling, the theory is here cast in words.

MMT draws on the post-Keynesian tradition, where there is no general tendency for the economy to move toward full employment, even in the absence

⁷This issue has been recently discussed by Jayadev and Mason (2018), who hold that MMT and orthodox macroeconomics rely on many of the same theoretical foundations, with the only difference that mainstream economists think that monetary policy should be privileged to look after full employment and price stability, while MMT economists think fiscal policy should have that role. This conclusion (and the methodological approach applied to arrive at it) has been strongly opposed by Mitchell (2018).

of market imperfections and rigidities. Also, in contrast to mainstream (new Keynesian) macroeconomics, the notion of a natural interest rate is meaningless in MMT, and the theory does not accept that policy-administered interest-rate adjustments can be relied upon to generate full employment, including when the economy is not at its effective lower bound. MMT rejects the loanable funds theory that underpins mainstream macroeconomics (Kelton, 2020); it does not consider optimal intertemporal allocation choices from households and firms, and does not recognize any role for (rational) expectations in such decisions; it also discards the concept of government budget constraint as untrue, since governments (with monetary sovereignty) can always issue the money they need. The theory predicts mechanistically that changes in money-financed fiscal deficits raise aggregate output, at no inflation cost, when output is below full employment. Finally, while MMT theorists have never subjected their theory to formal treatment by mathematical modeling, MMT is implicitly based on resource-flow identities that give no consideration to the prices at which (financial and nonfinancial) assets must trade for their respective demand and supply to balance, or to the impact that equilibrium prices exert on the real economy.

The fact that the aggregate expenses of one sector of the economy is the income of other sectors, and aggregate saving is always a residual of aggregate investment, does not necessarily imply that savers are always willing to hold any asset stocks that are supplied to the economy, unless the prices of these asset stocks adjust adequately (and are expected to be sustainable)—a point noted earlier. Failure of prices to attain equilibrium, at which asset stocks are fully demanded, leads savers not to absorb any addition to those stocks in their portfolio and possibly even to reallocate their portfolios away from those stocks, causing their value to decline. On the other hand, equilibrium asset prices, even if achieved, might not be consistent with full employment and, with imperfect markets, there might not be mechanisms to ensure such consistency. This is not an issue of aggregate saving's adequacy, but one of optimal portfolio composition *vis-à-vis* wealth-holder preferences, with equilibrium prices equating the supply of and demand for money *vis-à-vis* other assets into which wealth holdings can be placed, based on wealth-holders' preferences to hold them in liquid and/or less liquid forms.

Given the centrality of money for MMT, the theory's basic economic relations must be represented—albeit informally—in a way that allows for evaluating their consistency with the following three critical restrictions on money: (i) money has a positive price, (ii) the price of money (like any financial liability) reflects essentially the credibility of its issuer, and (iii) there is always an optimal demand for money in the economy, based on money's stream of pecuniary and nonpecuniary returns and its associated opportunity cost. Optimality implies the possibility that money supply exceeds its optimal demand.

The MMT Model in Words

The 'informal' model used here represents an open and internationally highly financially integrated economy (in a sense to be defined below). The economy consists of three markets: the market for real domestic output, which can be used for consumption and investment; the market for money, which supports domestic transactions; and the forex market, where net export is the difference between export and import. In a less-than-full employment economy, without public debt and taxation as noted above, money is supplied through the fiscal expenses of a consolidated public sector, which includes the government sector and the central bank. Note that any taxes and public debt issuances would subtract from the stock of money in circulation, while public debt repayments and interest payments would add to it. Money is injected in the economy to offset private sector net (desired) saving surpluses, calculated as the difference between saving and investment, causing actual output to be below the level of output that corresponds to the full employment of the economy's resources. With inflation 'off,' both taxes and public debt in the model are set to zero and the government can determine monetary policy so that the government issues and spends additional money to eliminate the output gap.

To simplify the analysis in a way that is consistent with MMT, price inflation below full-employment output is expected to be zero and expansionary policies do not affect inflation until full employment is reached. In other words, the 'on-off' model of inflation is adopted whereby the economy is initially below full employment and output responds fully and seamlessly to demand. Below full employment, the inflation switch is 'off' and expansions of aggregate demand

generate pure output gains and no inflation; at full employment, the inflation switch is 'on' and expansions of aggregate demand generate only price rises with no real output effects (Palley, 2013). As the model's results show below, however, this inflation model proves invalid, as inflation may actually occur in response to expansionary policy shocks, even when the economy operates at less than full employment.

Under high international financial integration, the economy's public liabilities (money and, when issued, debt) are traded in the international financial markets at prices that are determined by the allocation choices of 'marginal investors' who, acting as wealth holders or on behalf of wealth holders, can shift capital in and out of countries in real time and at negligible transaction costs, do not suffer from 'home bias,' and manage investments taking on global perspectives.⁸ Wealth holders (including a broad range of domestic and foreign agents, from households and firms accumulating savings and profits, respectively, to financial intermediaries managing wealth on behalf of their clients, or on their own behalf) bear the primary interest to preserve and possibly increase the real value of the wealth holdings in their possession or custody. They ultimately determine the allocation of money to the economy and internationally: the easier their capacity to access (directly or indirectly) the markets and to mobilize funds through them, and the higher the concentration of wealth holdings, the larger and faster the diversion of excess money holdings (to be defined below) into foreign asset positions, with consequent depreciation of the domestic currency.

The model is applied to two hypothetically identical economies that differ only for the level of policy credibility attributed to them by the markets: a highly credible (HC) economy and a low credibility (LC) economy. The expression 'policy credibility,' here referred to country governments, indicates the extent to which economic agents believe the government will carry out the macroeconomic policies it has promised to pursue (Backus and Driffil, 1985a, b; Kreps and Wilson, 1982). This notion relates to both the will and ability of the government to deliver on its policy commitments. Market judgments on policy credibility thus draw on a country's past policy track record, its resolve to pursue

⁸ See my works on PTI, cited earlier. While even in closed and financially unintegrated economies, large wealth holders always find ways to move money abroad (not infrequently illegally), governments can rely on captive (if not repressed) markets to place their liabilities at subsidized conditions, without having to confront the judgment of the markets and the constraints imposed by them, though at the cost of significant economic distortions and limited or no access to valuable investment resources from abroad.

pre-announced policy commitments and targets, and the adherence of its policy framework to what markets consider to be sound economic management and financial stability criteria.

Model specifications

In line with MMT, aggregate output adjusts fully and seamlessly to demand, until it reaches its resource full employment level (see also the above discussion on inflation). Consumption behaves in a typical Keynesian fashion with respect to income and is positive in real wealth. Investment is positive in the marginal efficiency of capital, which, in a typical Keynesian fashion, responds to entrepreneurs' long-term expectations as influenced by psychological factors, and negative in the real cost of funding defined.⁹ Notice that, in line with MMT, saving is a residual to investment (i.e., no loanable funds theory is assumed), which, however, does not rule out *ex ante* saving-investment inequalities. Net export is assumed to satisfy the Marshall-Lerner condition, and thus responds positively to the depreciation of the exchange rate. Net export and the capital account determine the changes in the foreign asset position of the economy, so that the capital account is uniquely determined by the interest rate differential between the domestic and rest-of-the-world economy. For simplicity, but with no loss of generality, this study takes the interest rate on foreign asset to be exogenous to the model and constant.

It must be noticed that if an imbalance were to materialize in the money market (say, the supply of money exceeds demand) and was not followed by an interest rate adjustment, then wealth holders would transform excess money holdings into additional foreign exchange (FX) holdings, and excess money would be withdrawn from domestic circulation. On the other hand, if the imbalance were followed by an interest (and exchange) rate adjustment, then there would be no change in FX holdings, and the excess money holdings would be absorbed and become part of the optimal demand for money.

Optimal demand for money and 'excess' money supply

⁹ As indicated by MMT proponents Bill Mitchell (2012) and Warren Mosler (see Rowe, 2011), MMT accepts Michal Kalecki's consideration that the risk of increasing indebtedness ensures that the marginal efficiency of capital is downward sloping with respect to the market rate of interest and that, all else equal, higher interest rates render unprofitable many projects that would otherwise be profitable.

A critical point to notice, which is neglected by MMT, is that the money supplied through deficit spending is not subject to the law of reflux (as is the case with credit money): the money created and injected in the economy can only be withdrawn by taxation and/or bond issuances. Therefore, for a given nominal output, and all else being equal, any sequence of net injections of money in the economy causes the stock of money to accumulate indefinitely, if and until the private sector remains in a net (desired) saving surplus position.¹⁰ Wealth holders unwilling to keep 'excess' holdings of non-interest-bearing domestic currency (with the notion of 'excess' money to be defined below) can dispose of it by buying foreign assets, in so doing depressing the external value of the domestic currency (money) and thus raising the domestic price of goods and services.

Notice that in an economy with alternative assets in addition to FX, wealth holders would also purchase speculative assets (typically those featuring very low output elasticity), with money shifting hands at an increasing velocity within select groups of (domestic and foreign) wealth holders, who would be acting in the expectation of extracting surpluses from further asset price increases, limiting money circulation in the economy, and eventually raising the risk of bubble bursts. In the model above, this chain of events would neutralize the wealth effect on consumption. At disequilibrium interest rates, while some individual wealth holders would be able to get rid of their own 'excess' money holdings, not all of them would be able to do so at the same time. If an equilibrium price is not reached, some wealth holders will ultimately be forced to stick temporarily to (at least part of) their excess holdings, until new opportunities would again be available for them to restore normal (optimal) holdings.

This implies that, under systematic implementation of MMT—that is, under the persistent application of MMT policy to maintain full-employment output on a long-term basis—the real money stock would grow indefinitely relative to real output, and a real interest rate would have to be paid on money holdings (if the money stock were to exceed its optimal level) to induce wealth holders to hold it at its given value (that is, without causing its value to fall).

¹⁰ As Palley (2013) observes, 'In a no growth economy, having the fiscal authority run persistent money-financed deficits will cause the money supply to increase relative to GDP ...' (p. 8), and dynamically the same would hold under MMT as the stock of money would grow at a rate higher than GDP (all else being equal).

This is henceforth called the ‘required’ real interest rate on money, and it is a government’s policy decision whether to pay it or not, as discussed below. However, if the government were not to pay an interest rate on money holdings, it would have to supply their holders with an alternative financial instrument that earned an adequate return (typically, debt), since they would refuse to hold excess holdings of an asset running a net positive and increasing cost.

Elsewhere, an optimal demand-for-money function is derived, which allows for determining ‘excess’ money holdings. According to this function, the ‘required’ real interest rate on money can be calculated and shown to be higher, the lower the credibility attributed to the economy by the markets.

Results of the MMT Informal Model

In the absence of a formal representation of the MMT, the analysis can only proceed through process analysis, that is, by investigating subsequent stages of actions–reactions. This obviously misses the richness of the analysis that formal models make possible—in particular, the simultaneous determination of equilibrium prices and quantities, given the interaction of the economic and financial variables. The dynamics thus unfold as follows:

1. The supply and demand for money determine the equilibrium real interest rate for any given stock of money, and both are considered in the relevant range where the stock of real money approaches its optimal level.
2. The real interest rate determined in the money market sets the real cost of investment funding. Together with net exports and the general price level, it determines the real exchange rate.
3. In line with MMT prescription, the government decides the additional permanent level of money-financed deficit spending required to bring output to full-employment level.
4. Finally, the new levels of money-financed deficit spending, real interest rate and exchange rate together cause the economy to reach a new level of output where the three markets are in (stock-flow) equilibrium.

The mechanism enters a critical zone when the stock of money in circulation exceeds its optimal level. This is the case if the government persists in

implementing MMT full-employment policy over time: as the money stock grows indefinitely, relative to output, and exceeds its optimal level, the economy is confronted with a steepening demand-for-money schedule, which gets even steeper as government credibility declines.

MMT cannot work as expected

The government implements MMT and pursues one of two options. It either decides that money holdings do not pay interest, or it pays a market interest rate on money holdings. The two cases are evaluated in turn.

Zero-interest rate

As above, the government permanently increases spending by issuing new money to expand aggregate output to its full-employment level. As the economy faces a demand-for-money function that is steeper as credibility declines, and as the larger stock of money supplied exceeds its demand at the zero-interest rate, the expansionary effect of government policy dissipates into higher demand for FX (as this is the only alternative asset assumed in the model). The dissipation neutralizes the increase in spending.

Notice that, at an invariant interest rate on money, the nominal exchange rate might depreciate unboundedly as a result of wealth holders diversifying the increasing stock of money into FX. However, the exchange rate pass-through effect would swiftly translate currency depreciation into higher inflation (in line with empirical research),¹¹ thus restoring the original value of the real exchange rate and bringing the external market back to its original equilibrium. In fact, the higher the expectations of currency depreciation driven by the expected indefinite growth of money, the swifter and more complete the pass-through effect of the nominal exchange rate on inflation: the real exchange rate would not change, but its numerator and denominator would both increase unboundedly. This would neutralize any expansionary effect of currency depreciation on output via net exports.

Indeed, the story might not end there: a high nominal exchange rate depreciation followed by a large increase in the general price level would further

¹¹ For a review of the empirical literature on policy credibility, the exchange rate and inflation, see Bossone (2022). On the relevance of the exchange-rate pass-through effect in particular for developing economies, see Vernengo and Pérez Caldentey (2019).

depress output through the contraction in the money supply and real wealth. Notice that a LC economy would stand to gain nothing by adopting a floating exchange rate regime: excess money would dissipate either into larger FX holdings, currency depreciation, or inflation, with negative real effects.

Market-based interest rate

Alternatively, the government takes the same action as above but, instead of pursuing the typical MMT's zero-interest rate target (irrespective of the positively sloped demand-for-money schedule), it pays the required interest rate, in an attempt to keep the money market in equilibrium; that is, it pays the real interest rate that money holders want for them to hold the growing stock of money.

Here, the permanent increase in aggregate demand through permanently larger money-financed fiscal deficits increases the real interest rate, causes the real exchange rate to appreciate, and eventually depresses output.

Notice that, if the output multiplier were (realistically) to vary inversely with the interest rate, the higher required interest rate paid by the government on money holdings would also negatively affect the investment and consumption components of aggregate demand.¹² Finally, notice that, as the money stock exceeds its optimal level, the increase in the equilibrium interest rate and its contractionary effect can take place at output levels that are below full employment: the larger the stock of money accumulating over time, the higher the equilibrium interest rate required by wealth holders to hold it, and the lower the equilibrium output obtained *vis-à-vis* its full-employment level.

This case supports an important conclusion that MMT theorists neglect: as the rationale for policy action rests on the existence of private sector structural net (desired) saving surpluses (i.e., the reason for an economy's tendency toward Keynesian unemployment or underemployment), the existence of such surpluses does not necessarily imply that savers are willing to hold all the money stock that will result from the permanent addition of money through larger fiscal deficits. A positive and increasing return on money will be needed to satisfy wealth holders. Failure to do so would lead the latter to reallocate their portfolios, causing money to lose its (internal and external) value even at less

¹² Consumption would be affected if the household's marginal propensity to consume out of current income were to decrease with the real interest rate, as supported by recent evidence (Hviid and Kuchler, 2017).

than full-employment output. On the other hand, if the required rate of interest were indeed paid to wealth holders, no mechanism might be in place to ensure its consistency with full-employment output.

Where MMT can (very exceptionally) work

This is the case where the economy enjoys high credibility in the eyes of the market. In terms of the above model, the case is one where the private sector's structural net (desired) saving surplus position impedes the attainment of full-employment output and the government engineers a permanent expansion of public spending financed with new money issuance to offset the output gap and achieve full employment. The issuance of new money, either used as international reserve currency or exchanging at par with the latter (in force of its strength), supports the larger flow of imports following the larger output.

This case is the MMT 'prototype.' To the extent that the money issued by the HC economy continues to be fully trusted by the agents domestically (and internationally, in the case of a reserve-issuing economy), the MMT policy can be sustained over time. True, as the stock of money grew indefinitely with respect to output, and eventually exceeded its optimal level, the economy would end up encountering the critical point where the demand-for-money schedule starts rising, engendering the effects that will be discussed below for the case of less credible economies.

Yet, this does not need to happen in an HC economy. As its money is fully trusted, a closure of the budget deficit would come from the wealth effect on consumption, which is induced by the sequence of money supply injections through the budget.¹³ The larger stock of real money—if spent on consumption—stimulates aggregate demand; this increases output, reduces the private sector net (desired) saving surpluses and, hence, narrows the fiscal deficits needed to support full-employment output with stock-flow equilibrium (and zero sector surpluses/deficits). In other words, the wealth effect 'rescues' the economy by preventing the money 'floods' that would otherwise follow from MMT policy. One would be tempted to say that, when and where it works, the wealth effect saves MMT from itself ...

¹³ This was noted by Palley (2013), who specifically refers to the Pigou effect. Also, in a model where taxation would be included in the form of income taxes (instead of, or in addition to, lump sum taxes), the adjustment of the budget deficit would occur not only through deliberate reductions in public expenses (mirroring the absorption of the private sector surplus) but also, or even exclusively, through higher government income. The same private sector saving surplus would be reduced not only by the wealth effect, but also by reductions in household disposable incomes.

Thus, whether such new equilibrium is attained depends on how efficient the wealth effect turns out to be. It is likely that in HC economies, and especially in economies that issue international reserve currencies, the effect would be efficient, as the currency is always high in demand. Under an optimal intertemporal framework of household consumption decision, the wealth effect would build up slowly, and might even require some long interval, until it pushes the economy to full employment, but this would eventually happen (absent adverse shocks).

It is no coincidence that MMT proponents largely base their view on the USA (Palley, 2020), whose economic, political and military prowess, as well as central role in the world economy, are such that (especially in times of crisis) people inside and outside of the country are willing to buy as many dollars as get printed, in order to prompt aggregate demand, with little or no changes in interest rates. And it is no coincidence, either, that MMT proponents also use the apparently unlimited capacity of Japan to absorb the huge amounts of yen printed under Abenomics, as evidence to support the sustainability of MMT policy prescriptions, thus generalizing what is in fact is a very atypical and exceptional country case: one where even panics originating domestically cause the currency to strengthen, not to weaken, as would happen almost anywhere else.

However, one should not conclude that these countries would have a free hand to issue their currencies unlimitedly. There is always a point after which markets might not be willing to absorb the quantity of money supplied at the going price, especially if they expect the supply to grow unchecked. Any government of any country faces an intertemporal budget constraint, whose elasticity ultimately depends on the market demand for public sector liabilities; that is, the desire of people to hold those liabilities. However elastic the constraint is, it always has a limiting stretching point, which may vary according to times and circumstances (Bossone, 2023).

Discussion

As shown in the previous section, under an MMT policy program the money that is injected by the government in the economy through the fiscal deficits is never destroyed: it accumulates indefinitely somewhere in the economy (all else

being equal), unless it is taxed away or public debt is issued, and someone has to hold it. This requires that wealth holders must be paid a rate of return high enough to induce them to hold a money stock that, at some point, will *a fortiori* exceed its optimal level, all else being equal. In fact, the more the economy is internationally integrated and the more concentrated is its aggregate wealth, the higher is the tendency of wealth holders to diversify their holdings out of money and into other (domestic and foreign) assets, causing money to lose (internal and external) value at any level of output. If a price mechanism is not adopted to ensure equilibrium in the money market, taxation and/or debt issuances may need to be used, even before full employment is reached. Thus, in both cases, the achievement of full employment is prejudiced.

The persistent creation of 'excess' money becomes a critical issue when the economy suffers from weak credibility. In today's open and internationally highly financially integrated economies, public sector liabilities (money and debt) are subject to scrutiny by the financial markets, which attribute a degree of credibility to every economy's policy regime, institutions and conduct. Whether the market assessments of such credibility are right or wrong is not the issue; what matters is that public liabilities are 'priced' in, and by, the markets based on those assessments. This pricing process determines the policy space available for national policymakers to make active use of the macroeconomic levers and affects their effectiveness: some countries are more policy-constrained than others, depending on their credibility, and only a few enjoy a very large policy space.

The fact that a country exercises monetary sovereignty, and thus may not be forced into default on its financial obligations (indeed, one of the most critical MMT tenets), does not automatically imply that the money issued retains its value. On the contrary, any prospects of this sovereignty being abused by the government leads the markets to expect the value of money to decline. Well-informed wealth holders, with easy access to markets, want their money to (at least) keep its (internal and external) real value: to them, default events are not just when the government cannot pay its debt back, but also when it pays its debt with depreciating money. If wealth holders expect such future occurrences and are not adequately compensated *ex ante* for potential losses, they can opt out of the money rapidly, at any time and at no cost, and shift their portfolios into alternative assets, causing money to further depreciate. As regards the

irredeemable money issued by a poorly credible government of an open and internationally highly financially integrated economy, a stock of such money that were to grow indefinitely relative to output would be expected to lose external value (that is, to depreciate) as well as internal value (through inflation) as a consequence of the exchange rate pass-through effect.

The government might try to bring equilibrium to the money market by paying an adequate interest rate on money holdings. But the equilibrium interest rate required to restore equilibrium would be increasing (as the money stock would grow indefinitely) and it would soon become unsustainable and inconsistent with full-employment output.

Mosler (2018) argues that the government spends money and then borrows what it does not tax, because deficit spending that was not offset by borrowing would cause the money market interest rate to fall. In this case, in fact, public debt would have to grow indefinitely as new debt is issued to absorb new injections of money and all the existing debt must be perpetually renewed (otherwise, the stock of money would start growing again). Each subsequent issuance of debt would add to the stock of debt outstanding and inevitably depress its price, all else being equal. As a result, the interest rate required by the market to absorb the increasing stock of debt would have to rise indefinitely, too, with obvious implications for the real economy. In other words, if money-financed fiscal deficits are permanent, either the money stock grows indefinitely or the stock of debt must, in its place. In either case, or all else being equal, the price of the increasing stock declines (its required rate of return rises).

A related way to consider the same issue is that a theory that, like MMT, builds on the unconstrained power of the state to issue money must assume that the state is capable of preserving the internal and external value of the money it issues. This calls into question the credibility of the money-issuing state: the lower such credibility, the lesser the willingness of wealth holders to absorb the increasing stock of money supplied at zero-interest rate (due to the risk of money losing value in future). This issue is especially relevant, and bears critical economic policy implications, where the economy is open and internationally highly financially integrated and where wealth is largely concentrated and managed by investors who can conveniently transfer funds across alternative assets through efficient financial markets.

Conclusion

While MMT is subject to various criticisms (see the third section covering relevant literature), this article has aimed at one specific (and yet very consequential) weakness of MMT. If MMT policy is applied systematically in economies other than those that are characterized by very high policy credibility and/or issue international reserve currencies, a twofold risk arises: (i) either not all the (growing) money supply issued by the government is absorbed by the economy at an unchanged zero interest rate, causing money to lose value, weakening demand, and hampering the achievement of full-employment output, or (ii) the absorption of the growing money requires such a high interest rate to be paid on money holdings that it would eventually also defy the achievement of full employment.

This twofold risk points to a fundamental question that often goes unaddressed when evaluating MMT: the theory holds that, in order to ensure full-employment output in an economy with structural private sector net (desired) saving surpluses, a future stream of fiscal deficits would have to be permanently financed through state issuances of an irredeemable (non-defaultable) zero-interest bearing instrument—i.e., money—instead of placing redeemable (defaultable) positive interest-bearing instruments—i.e., debt—in the market. Yet, the theory does not explain why, especially in the context of open and internationally highly financially integrated economies, wealth holders should be willing to hold an indefinitely growing stock of money, and what would happen to output and resource employment if wealth holders were not willing to hold a non-interest or insufficient-earning asset (money) beyond a certain threshold.

Aspromourgos (2018) makes this point with great clarity:

[I]n a world of inconvertible fiat currencies, public investment as a driver of aggregate demand faces little financial constraint. In the first instance, such a constraint would exist only to the extent that the suppliers of goods and services that government wishes to purchase are resistant to accepting payment in outside money or 'cash' (including electronic or 'book entry' outside money). But the willingness of private sector agents to accept payment in cash is one thing; their willingness to then hold money, as a desired asset, is another. If there results excess money

holdings for the private sector as a whole, then it is possible that the excess can be drained from the private sector via its purchasing government securities of various maturities ... [I]f, at prevailing yields on government securities, the private sector as a whole is unwilling to substitute government securities for the entirety of any such excess money holdings (net of taxation), then that money will find its way into other channels (expenditure on other assets or on goods and services) until it ceases to be an excess—unless government yields become more attractive. (p. 510)

Once again: sustainability depends on the credibility attributed by the markets to the national economies. A country that issues a currency that is used as international reserve and is always in high demand (especially in times of crisis) is largely unconstrained and can pursue MMT policy until the wealth effect allows private sector net (desired) saving surpluses to be eliminated; as a result, the need for monetizing additional fiscal deficits would be removed. At the other extreme, a country whose currency nobody wants to hold would not even be able to make it more attractive by paying extraordinarily high interest rates on it, which would be inconsistent with full-employment output anyway. As the only remedy, the country would have to reform its own policy regime and try to acquire credibility in the eyes of the markets by acting in a financially conservative way. This would most likely come at the cost of less than full employment.

Modern money theory (MMT), understood as the permanent monetary financing of fiscal deficits aimed to offset the contractionary impact on output deriving from private sector structural net (desired) saving surpluses, would be no cure for an economy's persistent tendency to Keynesian unemployment or underemployment (except, perhaps, in very few countries' circumstances). Unless the economy were perceived to be strongly credible, the systematic implementation of MMT would expose it to significant risk of instability.

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