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# MODERN MONETARY THEORY

Why it can't provide sustained  
economic growth and low inflation

Juan E. Castañeda  
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**Juan E. Castañeda** has been the Director of the Institute of International Monetary Research since 2016. He earned his PhD in Economics in 2003 (UAM University at Madrid) and has experience working and researching in monetary policy and central banking. After 14 years at UNED university in Madrid, he joined the University of Buckingham as a Lecturer in Economics in 2012. He has worked with the European Parliament's ECON Committee as an external expert. He has been an Honorary Senior Visiting Fellow at Cass Business School (London) and a visiting researcher at the Centre for Monetary and Financial Alternatives at the Cato Institute (Washington, DC) and at UFM university in Guatemala. He has authored and edited academic books and research articles on money, monetary policy and central banking. He is the review editor of the journal *Economic Affairs* and a member of the Institute of Economic Affairs' Shadow Monetary Policy Committee.

# Summary

- Since March 2020, central banks in major economies have been (partially) monetising government deficits through the purchase of a significant part of the new debt issued by the government. In the UK, this has resulted in the rate of growth of money broadly-defined (M4) reaching an extraordinary 14 per cent in 2020.
- Advocates of Modern Monetary Theory (MMT) propose the systematic use of the state's monopoly power to print money to pay for government deficits (a 'partial MMT' programme), or even all government spending (a 'full MMT' programme).
- The application of a 'partial MMT' policy in 2021 in the UK would have led to even higher growth rates of money than in 2020 (above 14 per cent). If a 'full MMT' policy had been adopted, and thus all government spending were monetised by the Bank of England, the annual rate of growth of money would have been above 48 per cent in 2020 and would be above 35 per cent in 2021 and 24 per cent in 2022. These figures are incompatible with stable economic growth and low inflation over the medium and long term.
- When applied to the USA, the monetisation of all the federal deficit in 2020 would have contributed to a 37 per cent increase in the amount of money broadly-defined (M3), compared with the (already extraordinary) 22 per cent registered increase in 2020. In a scenario of a 'full MMT' policy, with the monetisation of all federal government spending, the contribution to the growth in the amount of money in the USA would be of 53 per cent in 2020, 18 per cent in 2021 and 13 per cent in 2022.
- In an MMT-dominated world, the central bank's only role would be to accommodate fully the financial needs of the Treasury, determined by the government's own economic policies and political goals - leading to a 'fiscal dominance' scenario.

- Ample statistical evidence shows the correlation between excessive money growth and higher nominal income and inflation. When the amount of money in the economy is too large for too long, there will inevitably be inflationary pressures in the medium to the long term. This has already been the situation since March 2020 particularly in the USA, but also in the UK and the eurozone.
- Central banks need to choose between either surrendering monetary stability and low inflation altogether and effectively moving towards the adoption of an MMT paradigm, or taking the necessary measures to rein in inflation and take back control of the amount of money in circulation. If the former, both historical evidence and sound monetary theory point at an economy entrenched in enlarged government spending, much higher rates of growth in the amount of money, and therefore higher inflation.

# Introduction

Central banks and governments in most advanced economies have reacted to the Covid-19 crisis very aggressively and decisively. With the data available in early January 2021, annual money growth has reached extraordinarily high rates in modern peacetime in the USA (above 22 per cent) and has also increased quite significantly in the eurozone (10.5 per cent), the UK (13.9 per cent) and Japan (7.6 per cent). This has been the consequence of the provision of new and unlimited lending schemes to the banking system, as well as the launch of new asset purchase programmes (i.e. quantitative easing) on an unprecedented scale by central banks since March 2020, mostly consisting of the purchase of public bonds but also of private assets. This is not a novelty in economic history. In many other crises, when the state had exhausted other means of finance it has had privileged access to the funding provided by its national central banks in various forms: via lending to the government (i.e. purchasing public debt) or just by printing more money and 'handing it over' to the government. Both policies result in, respectively, the indirect and direct monetisation of the government deficit. According to International Monetary Fund forecasts (IMF 2020), the US government is expected to reach the end of 2020 with a -18.7 per cent government deficit ratio to GDP, the UK with -16.4 per cent and the Eurozone as a whole with -10.1 per cent; and these figures are expected to remain quite high by the end of 2021 (-8.6 per cent, -9.1 per cent and -4.9 per cent, respectively).

Since March 2020, central banks have been (partially) monetising these deficits through the purchase of a significant part of the new debt issued by governments. This has been done to facilitate the funding of enlarged public spending programmes since the outbreak of the pandemic and the imposition of severe lockdowns. Is this a concern at all? If it is, shouldn't the obvious response be quickly to halt this process of enlarged government deficits and accelerated money growth? If it is not, however, shouldn't we

instead fully embrace Modern Monetary Theory (MMT), take a step forward and fully exploit the 'printing press' privileges of the national central bank? These are the questions discussed in this paper, with a particular focus on the US and the UK economies.

# MMT fundamentals: what money is and how it is created

The self-proclaimed Modern Monetary Theory (MMT) has gained more attention in recent years, especially in the aftermath of the Global Financial Crisis (2008-09) and the eurozone crisis (2010-12), when treasuries in most advanced economies rapidly accumulated high debt-to-GDP ratios: from levels around 45 per cent in 2001 to 67 per cent in 2009 and a peak of nearly 76 per cent in 2014 (IMF 2020). In assessing MMT analysis and policy implications I must start with an important caveat. The exposition of MMT's fundamentals is far from being clear; in fact, it is often very imprecise and even contradictory, which makes it difficult to grasp all its fundamentals and produce a thorough and consistent assessment. I will be using the works written on MMT by some of its major exponents in the last few years, namely the authors of a recent macroeconomic textbook based on the MMT postulates, W. Mitchell, L. Randall Wray and M. Watts; one of the self-proclaimed founders of MMT, W. Mosler; and the 2020 MMT best-selling author, S. Kelton.

Following Mosler (2020), MMT describes how the monetary system operates and how it can be used to derive important policy implications and, in particular, to change radically the way in which fiscal spending is financed. As Mosler (2020) puts it, the following statements are the foundation of MMT, and those upon which its more relevant policy proposals ultimately rely on:

MMT alone recognizes that the US Government and its agents are the only supplier of that which it demands for payment of taxes. That is, the currency itself is a simple public monopoly. The US government levies taxes payable in US dollars. The US dollars to

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pay those taxes or purchase US Treasury securities can only originate from the US government and its agents.

This is the focus of the MMT approach; the government as the monopolist in the issue of currency.<sup>1</sup> As Mosler continues, if the government holds a monopoly power as regards the creation of money, then ‘The US government and its agents, from inception, necessarily spend (or lend) first, only then can taxes be paid or US Treasury securities purchased’.

If you follow this rationale on how money is created, it effectively means that the amount of money in the economy depends entirely on the amount of government spending in the first place. It is as *if* there were no room for any other creation of money under MMT. And yet, in Mitchell et al.’s (2019) textbook, a whole chapter is devoted to describing (rightly) how banks create money *endogenously*<sup>2</sup> by lending to their clients. However, even when the ability of banks to create deposits (i.e. money) is acknowledged (ibid. 2019: 154-157), they don’t seem to think that this will have any meaningful bearing on inflation developments in the economy. We will come back to this in the next section.

As MMT correctly claims, under a fully fiat monetary system money can be created ‘ex novo’ by the national central bank, and as much as needed. Actually, this money is just the result of an electronic order made by the central bank. In Mosler’s (2020) words, ‘After spending is authorized by Congress, the Treasury instructs the Federal Reserve Bank to credit the recipient’s account (change the number to a higher number) on the Fed’s books’. Therefore, under these conditions, there is no theoretical or practical limit to the creation of new (fully electronic and fiat) money by the government.

This description of the monetary system and how all money is created allows for the monetary financing of all government spending by the national central bank, as instructed by the government. Accordingly, there is no need to issue (or pay back) government debt or to raise taxes to pay for government spending, now or in the future. Under MMT, the government

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1 ‘By placing government, as the currency issuer, at the centre of the monetary system, the MMT immediately focuses on how a government spends, and how that spending influences those aforementioned macroeconomic aggregates we seek to explain’ (Mitchell et al. 2019: 13) - those aggregates being the rate of growth and the level of output, the rate of inflation and the unemployment rate.

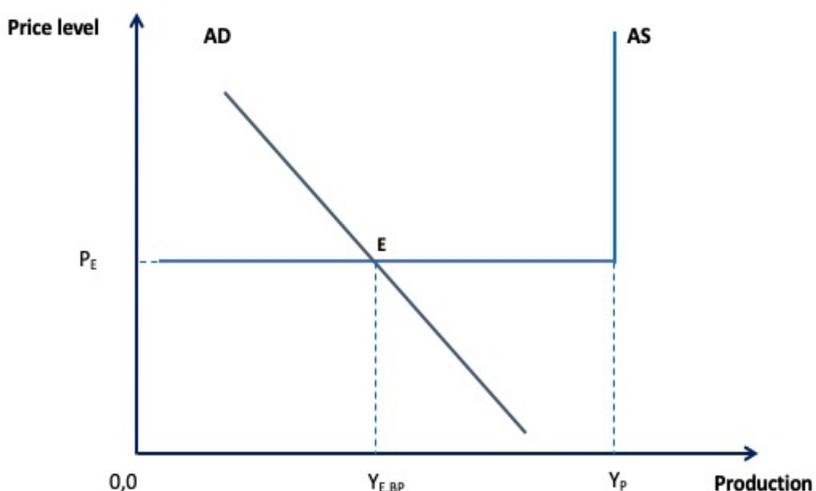
2 See Congdon (2019) for a detailed discussion on endogenous money in the Post-Keynesian tradition. See McLeay et al. (2014) for further details on the ability of banks to create money under fractional reserve banking.

can operate as *if* there were no financial or budget constraints. Moreover, as Mitchell et al. (2019) and Kelton (2020) stress, the monetary financing of government spending would not be inflationary, provided that the economy has spare resources to accommodate more spending. This seems to follow the traditional Keynesian macroeconomic models of the post-World War II period, which remained fashionable and the basis of economic policies until the oil crises of the 1970s. Under Keynesianism, active government spending programmes were recommended as effective counter-cyclical policies in a recession or when the economy was below its potential (i.e. still under a non-vertical aggregate supply (AS) curve, but rather horizontal to capture for price rigidity (see Figure 1 below)). Point E in Figure 1 represents an equilibrium in the economy with a below potential use of resources ( $Y_{E,BP}$ ). The range between a zero level of production (0,0) and the potential of the economy ( $Y_p$ ) is the so-called *fiscal space*<sup>3</sup> available for the government to spend more and thus expand the aggregate demand line (AD) towards the full employment and non-inflationary equilibrium. This explanation of inflation assumes that changes in the price level are not ultimately determined by the total amount of money in the economy, but by the amount of central bank money (and thus government spending under MMT) and the output gap. Following Mosler (2020), inflation is explained away by saying that if the amount of money created by the central bank is used to pay for a greater amount of goods and services created by government spending, it will not be inflationary.

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3 Defined by Heller (2005) as 'room in a government's budget that allows it to provide resources for a desired purpose without jeopardizing the sustainability of its financial position or the stability of the economy'. And more recently by De Grauwe and Ji (2019) as 'the capacity to use fiscal policies as a tool to fight a looming recession without the risk of destabilising their government debt levels'.

**Figure 1: MMT in a traditional Keynesian aggregate demand and aggregate supply model**



In Mitchell et al. (2019: 255-61) inflation is explained as a 'conflictual process' between two forces (workers and capital) in a power struggle to increase their share of the national income. However, following Mitchell et al. (ibid.), for this process to start it has to be initiated by either cost-push or demand-pull inflation in the first place. In this rationale, no role is given to the amount of money in the explanation of inflation or deflation.

To summarise the main assumptions and policy implications of MMT so far: (1) the government can spend as much as needed, provided that spare labour and capital supply are available; (2) larger spending policies can be fully paid for by the creation of new money balances by the central bank; and (3) inflation is not a concern if the economy has not fully reached its potential.

# MMT proposals and the reaction to Covid-19 by governments and central banks: a critique

The reactions of central banks to the effects of the Covid-19 induced lockdowns of the economy fall a long way short of a fully-fledged adoption of MMT's policies, but they do mark a significant move in that direction. The massive asset purchase programmes started in March 2020<sup>4</sup> have been undertaken *as if* the government faced no budget constraints (at least in the short term) and could maintain enlarged spending programmes and deficits, financed at virtually zero if not negative nominal interest rates. Since the deficit has been partially monetised by the central bank, one of the most remarkable (though expected) consequences of these policies has been the resulting extraordinary increase in the amount of money in most advanced economies, led by the USA. However, according to the MMT-ers' rationale, briefly outlined in the previous section, this should not be a source of inflationary concern during a great crisis. In this economic scenario, it appears that 'the quantity of money does not matter'. The next step towards a fully-fledged adoption of MMT would consist of the direct financing of government spending, by crediting in the government's account at the central bank the amount of all the (new) money needed to pay for it in full. In this case, there would be no need to issue government debt or to raise tax revenues in the future to pay for it. The central bank, as the bank of the government with (statutory) monopoly power in the supply of money, would simply create more money and credit the government's account at the central bank accordingly. Strictly speaking, this is the monetisation of government spending.

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4 For example, the US Fed's holdings of federal government debt as a percentage of the GDP increased from 16.5 per cent in the first term of 2020 to ratios above 23 per cent in the following two terms (Fred database (<https://fred.stlouisfed.org/>)).

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True, in a fully *fiat* monetary system - in other words, one where money is created by decree and the money issuer does not need to back-up the amount of money with any asset (be it gold or any other) to keep the convertibility of its money into such an asset<sup>5</sup> - the central bank can certainly create as much money as it wishes. In modern economies, central banks create money electronically by:

- lending to the government or the banking sector against collateral, or
- by directly buying assets from the private or public sector and crediting their accounts with newly created (purely electronic) money (i.e. so-called quantitative easing).

Both operations imply the creation of more central bank money (that is, an increase in the liabilities side of the central bank balance sheet), accompanied by either a temporary or permanent addition of bonds in the asset side of its balance sheet (see Table 1). But their consequences are quite different:

- When the central bank acts as lender to the government, this operation would be accounted for as borrowing in the government accounts, which means that the state would eventually need to honour this debt.<sup>6</sup> As shown in Figure 2, 'government bonds' in the asset side of the central bank balance sheet would increase by the amount borrowed by the government, and the central bank would increase the 'deposits from the government' entry in its liabilities side accordingly.
- However, if MMT policy recommendations are followed, the central bank could simply credit the account of the government without any other counterbalancing debit being required. This operation is, strictly speaking, the direct monetisation of the government deficit and no borrowing or lending operation would be accounted for. Therefore, the government debt volume and ratios would remain unchanged. It would mean the government having access to a 'permanent overdraft facility' from the central bank that does not have to be paid back in the future.

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5 This was the requirement imposed on central banks under the gold (or silver) standard for many years, effectively imposing a rule to keep in check the amount of money created by the central bank. See Bordo and Kydland (1999) for an interpretation of the gold standard as a policy rule.

6 'Or alternatively to refinance the existing debt with the issue of new debt'

By the latter operation the central bank would just credit the ‘deposits from the government’ account for the amount requested and, in order to balance the accounts, it could either increase the debit position of the government with the central bank for the same amount (‘government bonds’),<sup>7</sup> or let its equity capital value decrease by the same amount. If applied for a sustained period of time, this policy has very significant implications for the nature of what the central bank is, for agents’ expectations on government policies and the impact of it all on prices and the economy over the long term. MMT-ers are right in saying that the direct monetisation of public spending is an option at the disposal of the government. However, they seem to ignore the effects that such monetary financing of government policy would have on the economy and on prices over the medium to the long term. We return to these effects below.

**Table 1: Central bank stylised balance sheet**

<b>Assets</b>	<b>Liabilities</b>
Gold and foreign assets	Currency (banknotes)
Credit to commercial banks - Repurchase agreements (OMO) - Credit via other lending facilities	Commercial bank reserves (banks’ deposits)
Government bonds	Deposits from the government
Private sector bonds	Equity capital
Other assets	Other liabilities

OMO for Open Market Operations’

***It is not all about central bank money: the total amount of money matters***

There are major theoretical and analytical flaws in the MMT approach: firstly, the amount of money in any modern economy is far greater than the balance sheet of the central bank (i.e. the monetary base, made of banknotes and bank reserves at the central bank). The bulk of the payments made in our economies consists of the use of bank money, which moves from the buyer’s account into the seller’s account by the operation of debit

<sup>7</sup> As Dowd (2018) put it, this could be in the form of a perpetual bond the state would not need to pay back to the central bank in the future.

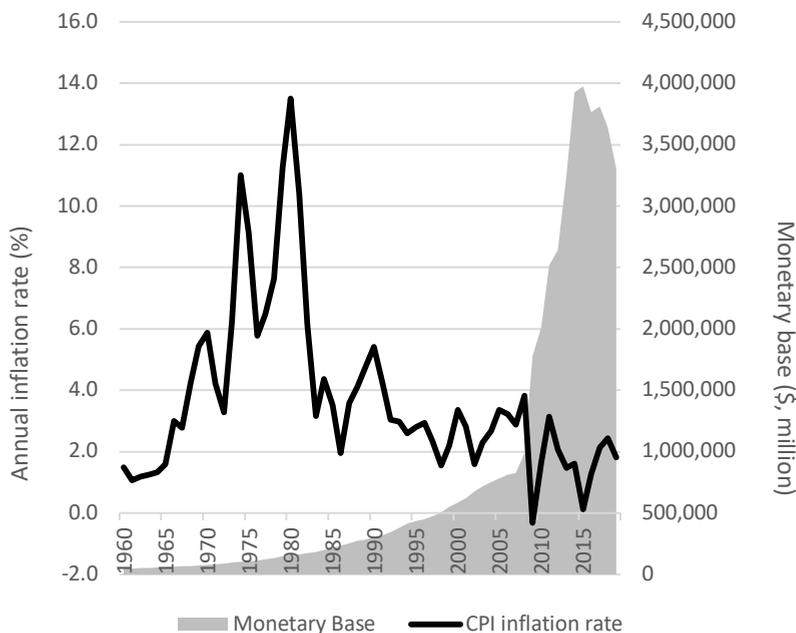
cards, direct debit orders, bank transfers or any other electronic means of payments. Normally, bank money (i.e. bank deposits) makes up around 90 per cent or more of the total amount of money available in the economy.<sup>8</sup> MMT advocates, though acknowledging the ability of banks to create money, seem to disregard the enormous significance of these payments in explaining major macroeconomic outcomes. True, commercial banks ultimately settle their (inter-bank) balances at the central bank, in the form of central bank money. But again, the amount of these net settlement operations is only a small fraction of the number of transactions taking place in a modern economy on a daily basis, with the use of bank money (i.e. deposits). So, yes, the state has a monopoly on the issue of banknotes and bank reserves (*base money* or *narrow money*) but banks, as independent actors from the government, do have the ability to create money – indeed, they create the bulk of the supply of money in a modern economy. And secondly, it is changes in the amount of money broadly defined which explain trends in inflation/deflation over time and not those in the monetary base (see Table 2 and Figure 2); this is precisely what is missing in the MMT-ers' analysis. The data clearly show that periods of consistently high rates of growth of broad money are accompanied by high rates of growth of nominal income, and overall, the relationship is almost proportional.

**Table 2: Broad money (M3) and nominal income annual growth (%) (USA, 1962-2019)**

Average	GDP	M3
Whole period	6.33	6.98
1962 - 1970	6.76	7.72
1971 - 1980	10.68	11.43
1981 - 1990	7.67	7.66
1991 - 2000	5.58	5.60
2001 - 2010	3.85	7.09
2009 - 2019	4.07	4.52

<sup>8</sup> The US Federal Reserve changed its operating policies after the Global Financial Crisis and started to remunerate bank reserves. As a result, since 2009 the ratio of the monetary base over the total amount of money has more than doubled, from approximately 6 per cent in 2008 to an average of 15 per cent since 2010.

**Figure 2: Central bank balance sheet and inflation (USA, 1960–2019)**

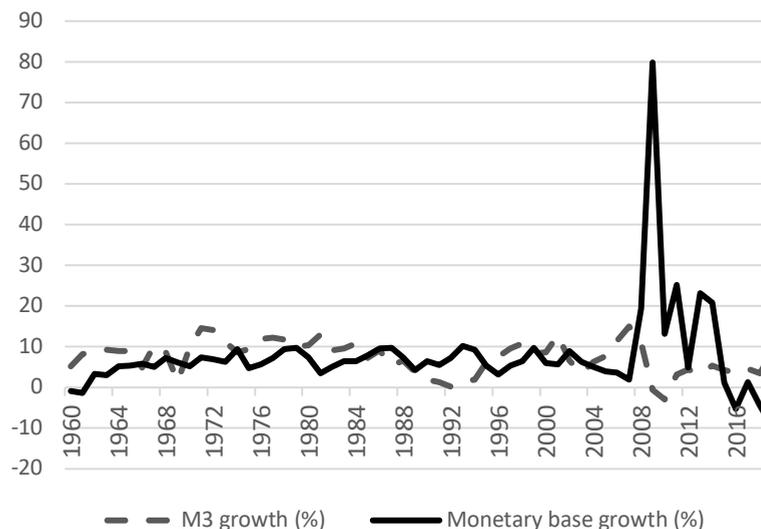


What households and particularly companies, both financial and non-financial companies, use in their transactions is the liabilities created by the entire banking sector, with those issued by the central bank being only a small part of the overall picture. This is something particularly relevant in times of crisis and great uncertainty, where the ‘money multiplier’<sup>9</sup> does not apply, as the increase in the monetary base by the central bank is not followed by a corresponding increase in the amount of money in the economy (see Congdon 2017). This is clearly illustrated in Figure 3. Notice how the monetary base in the USA exploded in 2009 with an 80 per cent rate of growth, while the amount of money in the economy actually fell in 2008 and 2009, thus explaining the deflationary pressures in the economy

9 Strictly speaking, *ex post*, we can always explain the amount of money in the economy as a multiple of the monetary base. However, *ex ante*, this relation is far from stable or reliable and it does not hold in times of crisis and severe changes in economic conditions and bank regulation. An example of it can be seen in the behaviour of the amount of money (broadly-defined) in the aftermath of the Global Financial Crisis, when bank capital regulation was significantly tightened and the four- or five- fold increase in the central bank balance sheet (i.e. the monetary base) was followed by monetary contraction in 2009 and 2010.

in those years. We will come back to this point in the next section, when discussing the potential effects of adopting MMT proposals as the basis of monetary and fiscal policies.

**Figure 3: Broad money vs. narrow money in the USA, 1960–2019 (annual growth, %)**



### ***The limits of monetary sovereignty***

Following MMT fundamentals, one of the major benefits of a fully (monetary) sovereign state, issuing its own fiat and free-floating currency, is that the government cannot ever default on the debt issued on its own currency. This is because the state, be it the government or the central bank, can always create more units of the national currency to pay for the debt.<sup>10</sup> This rationale is as misleading and inaccurate as naive.

MMT-ers are right that a fiat currency is not backed by any asset and, by definition, it is instead created as ‘decreed’ by the government. Thus, the government has the power to issue as much of its own currency as needed when paying for the national debt. But being fully fiat is precisely what makes its acceptance completely dependent on the ability of the currency

<sup>10</sup> ‘The most important conclusion reached by MMT is that the issuer of the currency faces no financial constraints. Put simply, a country that issues its own currency can never run out and can never become insolvent in its own currency’ (Mitchell et al. 2019: 13).

to be used as a means of exchange in ordinary transactions. It is trust in the stability of the purchasing power of the currency that explains its acceptance by the public. When lending money to sovereigns, creditors (particularly fund managers and international creditors) assess the ability of the government to honour its debt over time and they do it in real terms. This means that, when deciding whether to buy government bonds denominated in the national currency and the premium to charge for it, they assess the likelihood of expected changes in prices in the national currency and the exchange rate (i.e. whether the currency is expected to suffer significant changes in value compared with other international currencies).

History provides many examples of fiscally errant governments which have resorted to the 'printing press' to pay for unsustainable government spending, ending up with rampant inflation and even hyperinflation.<sup>11</sup> When inflation is too high creditors will not accept assets (such as government debt) denominated in a depreciated currency and the government will have to issue its debt in a foreign (more stable and credible) currency. MMT supporters seem to ignore that agents (creditors and ultimately all money holders) do not suffer permanently from 'money illusion'.<sup>12</sup> It may take some time for the actions of the 'printing press' to be reflected in higher inflation but, once the process starts and is applied as a consistent policy, agents will form the right price expectations and be able to anticipate higher inflation (see Barro and Gordon 1983). Moreover, under hyperinflation money holders eventually stop trusting the national currency and adopt other means of payments, such as a more credible foreign currency, in order to preserve the value of their income and wealth. Once the economy has reached the hyperinflation 'tipping point', the statutory monopoly power of the state will have virtually vanished. Money holders will replace the inflated - and often near worthless - national currency with a more reliable means of payments, such as effectively adopting the US dollar or the euro for making their daily transactions or denominating their savings. International creditors will stop accepting the debt denominated in the national currency and if there is any lending at all, it will be in a foreign currency which the national government cannot control and at a significantly higher premium. Recent examples of this are Zimbabwe in the late 2000s, Argentina in the 1990s and Venezuela since 2018.

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11 For example, see White (1958), and Campbell and Tullock (1954).

12 In other words, overall, agents try to assess the real value of their income, by discounting the effects of inflation or deflation on the purchasing power of their wages, profits and rents. This does not mean that they can do it perfectly but, once they learn the effects of inflationary policies, they will change their inflation expectations and also their behaviour to protect their income.

The fundamental laws explaining price changes and value in economics do not cease to apply under a free floating and fiat monetary system, as MMT-ers seem to imply. Money supply scarcity relative to the amount of goods and services produced in the economy will ultimately determine changes in the purchasing power of the currency over the medium to the long term. If too much money is created for too long, then prices will increase and the demand for the national currency will eventually fall and depreciate in foreign exchange markets. At this stage, 'printing' more money will only make the situation worse. As a study of hyperinflation episodes since the end of the 18th century points out (Hanke and Krus 2012), the vast majority of them took place under fiat and freely floating monetary regimes and were caused by errant governments unable to finance enlarged government spending. In sharp contrast to MMT recipes, Reinhart and Rogoff's (2008) empirical analysis of financial crises since the 14th century shows that the countries that have successfully managed to escape from a history of repeated defaults are precisely those where governments have anchored their currencies to an international and more credible currency, as well as made the necessary reforms to operate sounder fiscal and monetary policies. Furthermore, in Reinhart and Rogoff's (2013) paper, a strong correlation can be found between high levels of public debt, partial default on the debt and inflation rates above 20 per cent (in several countries between 1826 and 2010).

In essence, whatever the nature of the crisis, once it becomes a sovereign debt crisis, governments try to exploit their money creation monopoly to pay for the bills, which eventually results in higher and higher inflation. There are many examples of historical episodes where the removal of effective restrictions to print more money is soon followed by high inflation and even hyperinflation. And it is precisely the removal of these restrictions which lies at the core of MMT's main policy proposals.

### ***And what about the demand for money?***

MMT proponents very much focus on one side of the money market, the (narrow) supply of money by the state, but seem to ignore the overall demand for money. They narrowly put their emphasis on the demand for central bank money, as driven entirely by taxes, which in turn depend on how much the government has previously spent (see Mitchell et al. 2019: 137). However, it is the change in both the (broad) supply and the demand for money which explains changes in prices in the medium to the long term. As observed in the data, agents hold a quite stable ratio of (broad)

money balances to their total wealth or assets over time. They do not permanently wish to keep any excess of money balances over that ratio. The demand for money changes in response to financial innovation or during a major crisis, when money velocity tends to decline quite sharply.<sup>13</sup> This is because companies and households tend to keep a higher ratio of money holdings when uncertainty reigns in markets, as has been the case in many developed economies since the outbreak of the pandemic in March 2020. However, once the effects of a crisis are over and confidence is restored, the demand for money tends to revert to pre-crisis levels. This means that *changes* in the demand for money follow a normal distribution and are rather stable over the medium to the long term (see Congdon 2020). Therefore, periods of abnormally low money velocity will most likely be followed by periods of abnormally high money velocity.

The implications of these factors on the analysis and assessment of MMT monetary policy proposals are very relevant. Should the government and/or central bank inflate the market with too much money for too long, the excess of cash balances in agents' portfolios will inevitably trigger a re-balancing process in order to restore the desired cash-to-assets ratio sooner or later. This process will consist of, in the first place, financial companies increasing their demand for alternative assets to money, such as equities, real estate, private and public bonds. In so doing, the price of those assets will increase in proportion to the excess of money created in the first place. As shown in Congdon (2021), it is precisely the higher volatility and changes in financial companies' portfolios, as a result of changes in the amount of money, that explains fluctuations in asset prices in the short to the medium term. Ultimately, non-financial companies and households will also change their portfolios to get rid of the excess of money created by the government in the first place, and will also increase their demand for goods and services, thus increasing their prices.

The corollary of this analysis should not be dismissed. The demand for money is not infinite and remains quite stable over the medium to the long term. If the supply of money systematically exceeds the production of goods and services in the economy, first asset prices, but also eventually CPI prices, will rise accordingly. Unfortunately, this fundamental mechanism explaining changes in inflation and deflation over time is either ignored or totally neglected by proponents of MMT.

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13 Using US data, Congdon (2020) shows that the ratio of households' cash balances (i.e. money) over their net worth stays fairly stable over time, at around 10 per cent.

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## The monetary and inflationary effects of an MMT-er central bank

For an advanced economy to maintain a non-inflationary rate of growth, the amount of money should grow in the region of 5-6 per cent per annum. This is in line with the so-called Friedman's *K% rule*,<sup>14</sup> by which the rate of growth in the amount of money (broadly defined) should match the trend of the real rate of growth of the economy in the long term (2 per cent), as well as allow for zero or virtually zero inflation (1-2 per cent) and a secular decline in money velocity (-1 per cent). Of course, this should not be interpreted mechanically, but as the range of money growth between 4-6 per cent per year compatible with price stability over the medium to the long term.

$$m + v = p + t \quad (\text{Equation 1})^{15}$$

where 'm' is the rate of growth of broad money, 'v' changes in money velocity, 'p' changes in the price level and 't' changes in total transactions in the economy. When 't' is replaced by changes in the GDP and 'p' by changes in the CPI, the emphasis is placed on the relation between changes in the amount of money and changes in consumer prices over the medium to the long term.

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14 This rule can be taken as a proxy of a rule to maintain stability in inflation. See more on this and other alternative policy rules in Castañeda and Wood (2011).

15 Equation 1 is derived from the original Quantity Theory of Money equation where all the variables are expressed in volumes rather than in rates of change, thus  $M \times V = P \times T$ .

This rule provides a sound benchmark to assess the inflationary/deflationary policy bias of the central bank.<sup>16</sup> As stated above, the impact of changes in the amount of money in asset prices is quite immediate, but it may take 3-4 quarters to affect wider macroeconomic activity and 2-3 more quarters to affect CPI prices, depending on the scale of the monetary growth and the size of the output gap in the economy. In addition, during a great crisis, such as the Global Financial Crisis of 2007-2009 or the current pandemic, agents usually hold a higher amount of cash in their portfolios due to increased uncertainties in the market, thus delaying the effects on activity and prices until the demand for money reverts to pre-crisis levels. However, in the end, once confidence is restored and agents try to get rid of the excess in their cash balances, the price level will inevitably rise.

**Table 3: Total money supply and government spending in the USA and UK (volumes): contribution to money growth from the adoption of MMT**

**UK (£ billion)**

	Public Sector Net Borrowing	Total Public Spending	Broad money (M4x) (Outstanding amount)	Broad money (M4x) (Outstanding amount), under a price stability rule (6% rate of growth p.a.)	Contribution to broad money (M4x) (Outstanding amount), under a partial or full MMT implementation (*)	
					Partial	Full
2019/20	- 58	885.2	2,327	2,291	2,385.5	3,212.7
2020/21 (f)	- 354.7	1,140.9	N/A	2,429	2,740.2	4,353.6
2021/22 (f)	- 234.6	1,053.3	N/A	2,575	2,974.8	5,407.1

<sup>16</sup> Alternatively, the rate of growth of money compatible with a stable rate of growth of nominal income can also be used. This is what is proposed in Castañeda (2020) for the adoption by the European Central Bank as its main policy change in the review of its monetary strategy in 2020/21.

**USA (\$ billion)**

	Public Sector Net Borrowing	Total Public Spending	Broad money (M3) (Outstanding amount)	Broad money (M3) (Outstanding amount), under a price stability rule (6% rate of growth p.a.)	Contribution to broad money (M3) (Outstanding amount), under a partial or full MMT implementation (*)	
					Partial	Full
2019/20	- 3,132	6,552	25,265	21,956	28,397	31,817
2020/21 (f)	- 2,258	5,764	N/A	23,274	30,655	37,581
2021/22 (f)	- 1,056	5,050	N/A	24,670	31,711	42,631

Sources: For the UK, OBR, Economic and fiscal outlook – March 2021, and M4 figures from the Bank of England database, accessed online. For the USA, M3 figures as calculated by Government Shadow Statistics and CBO (February, 2021) for US federal spending and deficit. M4x excludes money holdings by other non-bank financial institutions.

Notes: (\*) By partial implementation of MMT we mean the central bank monetisation of the government deficit. For a full implementation of MMT, we assume that the central bank monetises all government spending.

For the calculation of the annual growth of UK M4x (see Bank of England, 2020) and US M3 (See Shadow Government statistics, 2020) under different scenarios, we have taken March 2020 as a reference point. In both cases the latest M3 and M4x figures for 2020 available refer to Nov. 2020.

Following the data and the simulations in Table 3 (a) above, the monetisation of the UK government deficit in 2020 alone (MMT, partial) would have implied an increase in money growth of 10%. With the latest data available, the amount of money in 2020 has increased around 14%, which shows how extraordinarily high the growth of money has been in the UK when compared to some of the MMT proposals. The application of a partial MMT policy would continue to produce a very high rate of growth of money in 2021 (14 per cent), to return to a more moderate rate (8.5 per cent) in 2022. If a full MMT were adopted, and thus all government spending were monetised by the Bank of England, the annual rate of growth of money would have been 48 per cent in 2020 and would be 35 per cent in 2021

and 24 per cent in 2022. When the same calculations are applied to the USA (see Table 3), the outcomes are even more staggering. The monetisation of all the federal deficit in 2020 alone would have contributed to a 37 per cent increase in the amount of money, as compared to the (already extraordinary) 22 per cent registered increase in 2020. In a scenario with the monetisation of all government spending, the contribution to the growth in the amount of money in the USA would be of 53 per cent in 2020, 18 per cent in 2021 and 13 per cent in 2022.

Note that the figures and estimates above only reflect the impact of the increase in the amount of money produced by the central bank through monetising the deficit or government spending. For more realistic (and greater) figures, we would also need to add the money balances created by banks (i.e. an extra 5-6 percentage points of growth in the amount of money). This means that with the application of a 'hard' MMT policy programme, the rate of growth of money in the UK and in the USA would remain in the double-digits area for a long time. As discussed above, the excess of money created will eventually be translated into double-digit rates of growth of nominal income and spending in the medium term. With such an increase in nominal spending, inflationary pressures will rise and become embedded in agents' expectations. Inevitably, this would mean a change to a long-term scenario of systematically higher inflation rates in the UK and in the USA associated with a higher (and more volatile) rate of growth in the amount of money.

## On 'fiscal dominance' and entrenched inflation under MMT

The adoption of the MMT main policy proposals would result in a drastic change in the institutional framework used by governments to make policy decisions and how they define their budget constraint and their relation with the national central bank. In an MMT-dominated world, a central bank would cease to bear any resemblance to a financial institution. Instead, it would become an outpost of the treasury, its behaviour determined in particular by government decisions to spend more or less, thus determining whether to create more or less money. In such a scenario, the central bank would not retain any meaningful degree of independence regarding the decisions affecting the amount of money in the economy or the interest rate charged in its regular lending to commercial banks. The central bank's only role would be to accommodate fully the financial needs of the treasury, determined by the government's own economic policies and political goals. This is what economists traditionally refer to as a 'fiscal dominance' scenario (see Sargent and Wallace 1981). In the aftermath of the Global Financial Crisis, when reflecting on his experience with the US economy and high inflation back in the 1970s, the former President of the US Fed (1979-1987), Paul Volker (2011) pointed out how difficult it was to return to more sound and sustainable monetary policies once fiscal dominance becomes entrenched. Adopting a fully-fledged fiscal dominance scenario would lead to a significant policy regime change, with enormous implications for long-term economic outcomes. As pointed out previously in this paper, if the financial constraint on the government were relaxed for too long, let alone eliminated as MMT would entail, there would be virtually no limit on money creation and rising inflation would rapidly become entrenched in the economy.

Currently, central banks are far from being in an ideal ‘monetary dominance’ scenario - in other words, one where an independent central bank determines its own targets following a clear policy rule and is not affected by government policies and decisions. From the outbreak of the Global Financial Crisis, the purchase by central banks of a significant amount of public debt has put them in a difficult position.<sup>17</sup> This trend has accelerated since March 2020, when central banks all over the world have drastically increased their public debt holdings and at a faster pace. Effectively, this is making governments more reliant on their national central banks’ direct or indirect purchases of their debt to finance their enlarged spending programmes at affordable (indeed virtually zero) rates. To be clear, the central bank purchase of public debt under QE programmes is not *per se* tantamount to central bank dependence on the government. As recently explained by the Deputy Governor of the Bank of England, in times of severe crisis it is expected that both the fiscal and monetary policy makers use their respective policies to support spending (Broadbent 2020), one of their tools being asset purchase programmes or the reduction of policy rates. However, central bank independence will be tested in the next 1-2 years, when a likely increase in spending and in CPI inflation will put central banks in an extremely difficult policy position (Goodhart and Pradhan 2020). They will have to choose between pursuing their own targets, which will almost certainly mean tightening monetary policy to avoid future inflation (i.e. monetary dominance), or else keeping very low interest rates and loose monetary conditions for longer to support the government (i.e. fiscal dominance).<sup>18</sup> At that point, central banks will need to choose between either surrendering monetary stability and low inflation altogether and effectively moving towards the adoption of an MMT paradigm, or taking the necessary measures to rein in inflation and take back control of the amount of money in circulation. If the former, both historical evidence and sound monetary theory point to an economy entrenched in enlarged government spending, much higher rates of growth in the amount of money, and therefore higher inflation.

MMT is not the right solution if we want to keep a sustainable rate of growth in the economy with low inflation over the medium to the long term.

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17 See Selgin (2020) for a more detailed analysis of this question as applied to the policies taken by the US Federal Reserve since 2008, and on the long-term implications for central bank independence. See also Capie and Wood (2013) for an assessment of central bank independence in times of great crisis.

18 In addition, from a financial point of view the increase of interest rates will reduce the value in the balance sheet of the central bank, therefore affecting its financial position too.

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The Institute of Economic Affairs  
2 Lord North Street  
London SW1P 3LB  
Tel 020 7799 8900  
email [iea@iea.org.uk](mailto:iea@iea.org.uk)

  
Institute of  
Economic Affairs