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Modern Monetary Theory, Fiscal Dominance and the European Central Bank

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Abstract

In this paper, Modern Monetary Theory (MMT) is confronted with the peculiarities of the institutional setting of the European Monetary Union (EMU) and the monetary policy of the European Central Bank (ECB). Since the financial and euro crises of 2008, monetary policy has changed drastically both in the eurozone and worldwide. With a Quantitative Easing (QE) policy, a new era of monetary policy began that made money available in almost boundless quantities and free of charge. This fits very well with ideas of MMT as it proposes a unification of fiscal and monetary policy in which the government finances its expenditures exclusively with newly created money. Taxes are only used for redistributing income and controlling inflation. Although MMT requires that the government has its own currency, it has been proposed as a policy concept for the EMU. The contribution of this paper to the literature is twofold. Firstly, it is demonstrated that the EMU's institutional setting is not suitable for MMT as the member countries' fiscal sovereignty contradicts the employment of taxation to control inflation. Secondly, MMT's inappropriateness for dealing with banking fragility and financial stability in the EMU is shown. Finally, it is argued that the existence of fiscal dominance in monetary policy is not sufficient for MMT's concept.

Keywords: European Monetary Union, European Central Bank, Modern Monetary Theory, Fiscal Dominance, Feedback Loops

JEL Classification: B52, E52, E53, E63, H63

I. Introduction

From a macroeconomic perspective, the first two decades of this century have been remarkable: The dot-com bubble was followed by the subprime crisis and the euro crisis. Later on, there was the Covid-19 pandemic and the war in Ukraine. During and after all these events, monetary policy played an important role as it was supposed to avert the consequences of these crises. In the eyes of

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many politicians, monetary policy has become a kind of miracle cure for all macroeconomic diseases. According to the ideas of Modern Monetary Theory (MMT), this seems to be true. Moreover, looking at monetary policies from the last two decades, it seems that ideas of MMT have already been put to work. This paper questions whether MMT can be or is applied in the eurozone. It can be shown that even if public expenditures, financed by money creation, are decided by a new EMU board or council, individual member states must give up their sovereignty for MMT to become a feasible option for the EMU. Moreover, this paper shows that MMT's ideas are inappropriate for dealing with banking fragility as well as financial stability, and that the existence of fiscal dominance in monetary policy is not sufficient for MMT's concept. All in all, MMT is not a realistic option for monetary policy in the EMU.

The remainder of this paper is structured as follows. The second section describes the most important ideas of MMT and the criticism thereof, while the third explains the particularities of the eurozone and the division of competences between ECB and member nation states. This section outlines the differences between the eurozone and the U.S. which is – in contrast to the eurozone – considered suitable for MMT policies of combining fiscal and monetary policy. The fourth section explains that, in contrast to MMT, money in the EMU (and in its individual member states) is endogenous to a certain extent as the ECB has no direct and complete control over bank money. The fifth section details how the ECB, contrary to its official mission, finances states via its QE monetary policy, thereby monetizing part of the eurozone's public debt. From this point of view, one can doubt whether the ECB is still an independent central bank and whether it is still able to ward off inflation. This question is further discussed in the sixth section by using four feedback loops of monetary policy. These feedback loops illustrate how a full application of MMT in the EMU is not possible because there are no incentives for the individual countries to employ their own taxation for inflation control, which would be necessary in an MMT world. This implies that for MMT to become an option for the EMU, individual member states had to give up their sovereignty.

II. What is MMT and what is its Aim?

The main idea of MMT is that the state is the sole creator of money, known as fiat money (for an overview, see e. g. *Beck/Prinz* 2019 and *Beck/Prinz* 2022 or *Ehnts* 2022). In MMT, there is no autonomous central bank, and the state and the central bank are seen as one unit (known as the consolidation hypothesis). A state issues money by buying goods and services from its citizens, thereby injecting it into the economy. People accept this money because they have to pay their taxes with it. As people pay their taxes, money is withdrawn from the circular flow of the economy. This simple idea has crucial consequences: First of

all, the state can never run out of money as it can print its own money to pay back its debt – a state that issues its own money can never default. Moreover, the only way to bring money into the circular flow of the economy is through government debt: By buying goods and services, money is being brought into the economy. From this point of view, money is a zero-bond with zero maturity and the government finances all expenditures through the creation of new money. This means that government debt is not a method to finance public expenditures but rather to inject money into the economy. Moreover, in MMT taxes are not seen as an instrument to finance public expenditures but rather to combat inflation: If prices increase, the government raises taxes, thereby reducing demand and the amount of money circulating in the economy.

However, several economic and institutional preconditions must hold true to use money as the sole financing tool:

(1) The economy is an open economy with flexible exchange rates or an economy with fixed exchange rates and capital controls. Capital controls may also be required for small open economies with flexible exchange rates (*Epstein* 2019, ch. 3.5, 40 f.) The best relevant application of MMT is an open economy whose currency is used for international payments in foreign trade as with the US dollar, for instance (*Epstein* 2019, ch. 4, 45 ff.).

(2) Although a country with its own "sovereign" currency cannot de facto run out of money, the internal value of money is endangered by uncontrolled inflation and the external value of money through devaluation. Moreover, many developing countries have their own currencies, but their scope for fiscal and monetary policy is very limited (*Epstein* 2020, 773).

(3) In almost all countries, the state's ministry of finance is separate from the central bank – whereas the integration of the central bank into the ministry of finance is a prerequisite for applying the ideas of MMT. Even when the central bank is not independent of the government, it has some degree of independence nonetheless. In particular, central banks do not and are in general not allowed to monetize the entire public debt. For instance, central banks of countries that are highly developed economically may not buy treasuries directly from the government.

(4) Competences for macroeconomic, environmental, social and many other policy areas are divided within governments and between governmental institutions. This is for good reasons, e. g. for economies of scale and scope. MMT requires an overarching government that encompasses all these policy areas in order to apply and combine fiscal and monetary policy in and with these other policies.

The policy objectives of MMT can be summarized as follows. The main goal of fiscal and monetary policy is to maintain full employment without unrestrained inflation (*Mosler* 1997–98). This goal goes back to Abba P. Lerner and

his concept of Functional Finance (*Lerner* 1943; *Forstater* 2010; *Mehring* 2010). However, in the wake of seemingly unrestricted money creation with a progressive agenda, a whole host of additional aims are propagated that serve the enhancement of social change and a subsequent restructuring of the economy, which are also referred to as the "Green New Deal" (*Holtz-Eakin* et al. 2019; *Galvin/Healy* 2020; *Dröge* 2022).

These ideas imply that the government can use debt to set up job creation programmes, climate protection programmes or other large-scale infrastructure projects as long as there is no inflation. If inflation kicks in, the government only needs to raise taxes to banish the threat of rising prices as this means a withdrawal of money from the economy. It is this message that makes MMT so attractive to politicians: In MMT, it seems that politicians can take a free ride simply by issuing money to finance social benefits or programmes designed to secure full employment. However, MMT does not describe contemporary monetary and fiscal policy but rather outlines – and prescribes – an alternative policy concept (*Schlotmann* 2021).

From an allocation policy perspective, it is not clear why it should be necessary for the government in general and monetary policy in particular to be responsible for the structural change in the economy.[1] In a market economy, households and firms decide decentrally on the allocation of resources and also on structural change. Government interventions must be justified by market failures. Of course, externalities and public goods require some government intervention. In this sense, government intervention in climate and environment protection is acknowledged, up to a certain extent. Moreover, monetary and fiscal policy are usually not seen as relevant instruments for climate and environment policy. The reason for this is that these policies are macroeconomic policies that are inappropriate for meeting microeconomic allocation goals. Therefore, the MMT approach to Green New Deals is normative as the proponents of MMT have decided for themselves that the usual division of competences between government departments and between government and markets are outdated.

With regard to full employment, the situation is somewhat different. A high level of employment is a goal of macroeconomic policy in most European (and other) countries. However, it is not the only goal (see for instance what is known as the "magic tetragon" in Germany). Moreover, unions and employer associations are also responsible for a high level of employment, as are the individual workers. Under these circumstances, the resulting equilibrium employment may not be increased without welfare losses. Therefore, the prescription of full employment, no matter what happens, does not seem to be the best policy goal (see

[1] We owe this aspect to an anonymous referee.

Negishi 1979, ch. 15, 195 ff., for an analysis of capital or labour dominated fiscal monetary policy combinations).

At the core of MMT, it is important to understand that in MMT, there is no bank money, i. e. no endogeneity of money. Fears that increased debt, which leads to an increase in the quantity of money, might stir up inflation are not shared by proponents of MMT. As long as the economy is in equilibrium with unemployment, increased government demand will only lead to increased production and not to higher prices. This assumption shows the Keynesian roots of this approach. But even with full employment, inflation is not a problem in the eyes of MMT as all the government has to do to combat inflation is to increase taxes to reduce the quantity of money. Moreover, the central bank may reduce the quantity of money further by means of a restrictive open market policy, thereby keeping interest rates stable.

A central hypothesis of MMT is what is known as the fiscal stance, which states that government spending equals real GDP multiplied by the average tax rate. This means that, ultimately, government spending is financed in real terms by taxes. In principle, this equation, which is as a matter of fact an identity, holds in all macroeconomic theories. However, unlike other theories, MMT postulates that this equation is not an identity but rather has a direction of action: By fixing government spending, according to MMT, the government can fix GDP so that full employment prevails. MMT thus assumes here that by fixing government spending, full employment can be achieved. In the case of unemployment, the government increases its spending until full employment prevails.

This programme implies that there is no independent central bank; government and central bank are one and the same, monetary policy is thus subordinate to government financing needs. This is also known as fiscal dominance: The government has complete control over the amount of money in circulation. As a consequence, the political programme of MMT thus ultimately calls for a full money system where commercial banks must deposit all customer deposits with the central bank and thus cannot create any money of their own. For as long as there is deposit money, companies and citizens may use deposit money to buy government debt, which in turn means that not every bond issued by the government leads to the creation of fresh money. As long as deposit money exists, monetary policy and fiscal policy remain separate policy areas. In MMT, monetary policy has no independent objectives but is only supposed to support fiscal policy. As a consequence, the government may be tempted to monetize all government debt.

Fiscal dominance means that the central bank is directly or indirectly forced to use monetary policy to prevent the government from defaulting. This leads to inflation, which is now no longer a purely monetary problem but also a political

and fiscal one. At least in the short run, such a policy – if a government default is successfully avoided – will prevent turmoil on financial markets and bank failures as banks are a government's most important lenders. However, in the long run cheap money and credit may inflate a speculative bubble in asset prices that will sooner or later burst.

Monetary dominance, for its part, means that an independent central bank only cares about monetary stability, i. e. keeping inflation low. This will lead to stability in financial markets as it avoids any bubbles in the long run, but is at odds with fiscal stability as it means that the government has to take care of its debt. As the central bank will not finance excessive government debt, a sovereign default may be more likely. Such a default would lead to bank failures and trigger a financial crisis. MMT with its focus on spending money ignores this issue of financial stability. Because of the sovereign debt-bank nexus, a heavily indebted country may cause financial turmoil not only in its own country but via contagion also in other countries, especially in currency unions with a common market.

Moreover, it must be said that at the end of the day, even in MMT, government expenditures are being financed by taxes: As the government buys goods and services, inflation will set in as soon as demand exceeds supply. This inflation is thus an expression of the fact that part of the goods purchased by the state cannot be financed by printed money; it is a financing gap that has to be covered by tax revenues. The result is therefore that, contrary to MMT's assertion, taxes do contribute to state financing and are needed for this purpose – via the detour of fighting inflation: Through taxes, the state siphons off the purchasing power of its citizens, which competes with the state's demand.

There are several other criticisms of the ideas of MMT beside this (for an overview, see e. g. *Beck/Prinz* 2019 and 2022). First, it ignores microeconomic theory not only in that microeconomic problems of job creation programmes are not discussed, but also in that expectations are neglected: If citizens expect either higher inflation or higher future taxes as government debt rises, they may behave accordingly in an evasive manner through tax evasion, voting by feet or at the ballot box. Most citizens may expect inflation to rise if they consider the political economy of such a programme: As the main aim of politicians is to get re-elected, one must expect them to (ab)use monetary and fiscal policy for vote buying – buy now, pay later – thereby increasing government debt and the risk of inflation.

Another point of criticism is that MMT is mostly about a closed economy – a government can never go broke as long its debt is only denominated in local currency. Nonetheless, the higher the government debt, the higher the chances that citizens will try to save abroad, thereby increasing their demand for foreign currencies, followed by a devaluation of the local currency. This makes clear

that the ideas of MMT may be quite convenient for a country with the exorbitant privilege of having a reserve currency (e. g. the U.S.), but not for countries whose currency is not in demand. Even more heterodox economists see problems with MMT as it makes institutional settings in the US, especially the amount of monetary independence and the privilege of having a reserve currency, a paradigm for MMT although institutional settings in the US do not serve as a blueprint for other countries (*Leaman* 2022).

For very left-leaning economists, a more radical change in institutions and processes will be necessary to reduce inequality – something that MMTs policy recommendations fall short of. They moreover criticise that MMT fails to take into account the increasing amount of financialization of the economy (i. e. the growing importance of financial markets and products) and that its views on taxation are too mainstream (ibid.). Moreover, the assumption of exogenous money creation is not valid as money is being created by credit demand from the economy (ibid.; *Heise* 2022). In general, it is criticised that the theoretical foundations of MMT are rather weak (*Heise* 2022); former ECB chief economist Otmar Issing even thinks that it is not a theory worth discussing (*Losse* 2022).

A closer look at the ideas of MMT reveals that – taking a very basic macroeconomic model in accordance with MMT's basic assumptions, in particular, taking account of money in the sense of MMT and assuming that all government expenditures are financed by new money – the resulting model is indistinguishable from simple Keynesian and neoclassical macroeconomic models (see *Prinz/Beck* 2021), even though a number of Post-Keynesian economists voice harsh criticism of MMT concept (see *Heise* 2022). Moreover, it lacks a sound economic foundation for its policy recommendations. One must doubt whether such a concept will make it at the ballot box – as *Sawicky* (2019) states: "A story that appears to emphasize unlimited public spending, besides being fallacious, will impress most people as either crankish or arcane. It isn't accepted by a wide spectrum of left-of-centre, nonMMT thinkers. Any existing progressive government that comes to power under such delusions is bound to disappoint its constituents."

III. Peculiarities of the Eurozone

The currency of the European Monetary Union (EMU) is the euro. In contrast to other currencies, it can be referred to as "stateless money" (*Bonefeld* 2018). This implies that the member states of the monetary union are responsible for adjusting their fiscal, economic, labour market, etc. policies so that the European Central Bank's (ECB) monetary policy stabilizes the EMU's price level. In particular, the ECB must not conduct fiscal policy whatsoever. A comparison of the ECB with the Federal Reserve System (Fed) in the U.S. is neither ex-

pedient nor commensurate since the U.S. has a federal system whereas the EMU member states are sovereign nation states and not the 'United States of Europe'. The intention is to create such a union in the near future, though, as stated in The Five Presidents' Report (*Juncker* et al. 2015).

A further consequence of the statelessness of the euro is that all government debt is automatically foreign debt. No country can individually inflate away some part or all of its government debt. This is the economic price countries have to pay for the loss of monetary sovereignty. For the survival of currency unions, the top priority is to avoid or avert sovereign defaults, a lesson from the dissolution of former currency unions (see *Åslund* 2012). Since national states are sovereign, neither the ECB nor any other institution in the EU has fiscal policy competencies.[2] However, fiscal restraints are necessary in a monetary union (*Chari/Kehoe* 2007) and fiscal rules exist for the euro member states that have been strengthened in the aftermath of the financial crises in 2007 and thereafter (*Leiner-Killinger/Nerlich* 2019). The primary goal of the rules is to stabilize the nation states' public debt. They encompass balanced budget rules, expenditure rules, debt rules and revenue rules (see, in particular, *Leiner-Killinger/Nerlich* 2019, Chart 1, p. 4). Nevertheless, the enforcement of the ECU rules determined by the budget criteria of the Maastricht Treaty (deficit less than 3 % of GDP, debt-to-GDP ratio less than 60 % of GDP) is still weak. This means that the fiscal policy rules are not followed by all countries in the ECU and EU area, even prior to the pandemic (*Leiner-Killinger/Nerlich* 2019, Charts 2 to 5, 8 ff.). The excessive deficit procedure within the Stability and Growth Pact was effective nonetheless, though mainly in the years 2011 to 2014 (*De Jong/Gilbert* 2020).

The division of competences between the ECB and the member nation states is as follows:

(1) The ECB's main task is to stabilize the rate of inflation at around 2 % p. a. Its instrument is monetary policy, i. e., setting the main rate for refinancing operations. In the wake of the financial and euro crises, additional instruments have been established, such as bond-buying programmes within the Quantitative Easing (QE) framework.

(2) The member states of the euro system are responsible for their own economic and fiscal policies, within the constraints of the EMU's fiscal rules.

(3) To maintain this division of policy responsibilities, the ECB must not conduct fiscal policy. This means that it must not bail out countries with unsustainable debt or deficits. The reason for this rule is to prevent member states from taking a free-rider position concerning their fiscal policies, labour market and welfare policies as well as public debts and budget deficits.

[2] It is debatable whether the NextGenerationEU programme that is financed by joint borrowing is a first step towards more fiscal competencies for the EU.

> Through these deliberate policies, the central bank is effectively forced to allow higher rates of inflation (*Chari/Kehoe* 2008).

However, the recent past has demonstrated that it is difficult to maintain this division of competences. In effect, the ECB intervened during the euro crisis in the years after 2011 with instruments to support countries with fiscal problems. The leading narrative was – and remains – "impairments to the monetary policy transmission mechanism" (*ECB* 2021, p. 12). Whatever the fiscal problem of a country, it can always be dubbed such a 'disturbance'. In this way, however, financial market agents (banks, investors, etc.) learn that "whatever it takes" (*Draghi* 2012), the ECB will find a way to support the respective countries with fiscal problems. The combination of the 'whatever it takes' approach and the permanent invention of new tools to support fiscally critical countries on the one hand and the weak enforcement of the EU's fiscal rules on the other make the EMU's free-riding problem unsolvable.

The peculiarities of the EMU make it very different from the U.S. Federal Reserve System. This is of relevance for MMT since monetary sovereignty is crucial for the fusion of monetary and fiscal policy in one hand. "Monetary sovereignty is key to understanding MMT. Governments need a high degree of monetary sovereignty in order to exercise policy autonomy – that is, to be able to run their fiscal and monetary policies without fear of painful backlash from financial or foreign exchange markets" (*Kelton* 2020, p. 142). The U.S. is a monetary union within one nation state that consists of 50 states. Fiscal policy is delegated to the federal government and monetary policy to the Federal Reserve System. The individual states are responsible for their public finances and they can become insolvent (for the origin and development of the U.S. federation with regard to public finances and monetary policy, see *Bordo/Jonung/Markiewicz* 2013, 458 ff.). Therefore, as already recognized by MMT protagonists, the U.S. is suitable for MMT policies of combining fiscal and monetary policy, with fiscal policy dominance (see for instance, *Kelton* 2020, 142 ff.). By contrast, the same protagonists deny that the same holds true for the EMU (*Kelton* 2020, p. 145), at least in the current institutional setting of the EMU (for a somewhat different view, see *Ehnts/Hoefgen* 2022).

IV. ECB, National Central Banks and Commercial Banks

Among the crucial functions of central banks is acting as a 'lender of the last resort' (LOLR; for a more recent view on this instrument, see *Freixas/Rochet/Parigi* 2004). The ECB's emergency liquidity assistance (ELA) is an example of this function as it allows banks to receive temporary credits if these are not available from other banks (*ECB* 2019). This function was of critical importance in the financial and euro crises, when banks did not provide such credits to each

other. As pointed out by Francesco *Papadia* (who managed the ECB's liquidity operations between 2007 and 2012), the ECB provided "elastic currency" during the crisis (2014, p. 94).

But it did not end there as the financial crisis became so severe that central banks invented Quantitative Easing (QE) as a new, longer-term emergency toolkit. In contrast to LOLR, QE is dubbed a "buyer of last resort" (*Acharya/Pierette/Steffen* 2021, p. 88) as in these programmes, central banks buy sovereign bonds (and corporate bonds) from commercial banks. QE was never intended as a permanent programme for buying (all or most) government debt, although the ECB can buy sovereign bonds in the secondary market from some specific countries without repurchase agreements as part of its Outright Monetary Transaction (OMT) programme. Economically, the latter is quasi-fiscal policy.

National central banks still exist in the EMU. Their main task is the implementation and execution of the ECB policy. In particular, they must not finance public debt in the primary market. Hence, neither the ECB as a supranational institution nor the member states' central banks can directly buy national public debt in the primary market. The latter is a precondition for the implementation of MMT within the EMU however.

Commercial banks are supervised by the ECB, with assistance from national central banks. Beside the national policymakers, the ECB can also regulate banking activities of commercial banks. Nevertheless, commercial banks can – and still do – create book money by lending bank deposits. In this way, additional money is created by banks that is not state money. Hence, in contrast to MMT, money in the EMU (and in its individual member states) consists of state money and bank money. This gives rise to two money circuits, and not only one, as claimed by MMT (see *Rohwer/Behr* 2021, p. 61; *Prinz/Beck* 2021). The state, like the ECB, has no direct and complete control over bank money; therefore, it is endogenous money. In MMT, this partially endogenous nature of money is not intended. The latter is the consequence of the existing two-tier banking system. A two-tier banking system contradicts the preconditions of MMT however. Therefore, the crucial mantra of MMT – neither taxes nor bonds finance public expenditures (*Kelton (née Bell)* 2000; *Kelton* 2020) – is untenable. The only possibility to get rid of bank money is to create a one-tier banking system in which commercial banks are merely branches of the central bank.

In addition, the omission of the second money circuit between commercial banks, corporations and private households makes it impossible for MMT to recognize the influence of financial markets on money and the macroeconomy – and *vice versa*. Since MMT ignores the second money circuit, it cannot deal with financialization, where "financialization corresponds to financial neoliberalism which is characterized by domination of the macro economy and eco-

nomic policy by financial sector interests" *(Palley* 2013, p. 1). According to *Hansen* (2014, p. 605), in around 1980 finance became the "master of society" for the second time, this time as "financialization". In more general economic terms, the hypothesis of this literature is that 'financial dominance' exists nowadays in developed economies.

By contrast, in MMT only 'fiscal dominance' and 'monetary dominance' can occur. Fiscal dominance means that the states' debt policy is dominant concerning monetary policy. Put differently, in this concept debt policy forces an accommodating monetary policy. Monetary dominance means that monetary policy sets constraints for fiscal policy via its interest rate, whereby it is the duty of governments to enforce a sustainable debt policy. Since MMT seeks to combine monetary and fiscal policy in the hands of governments only, there is neither monetary nor fiscal dominance, but the dominance of money. In economic terms, this means that public debt is always fully monetized.

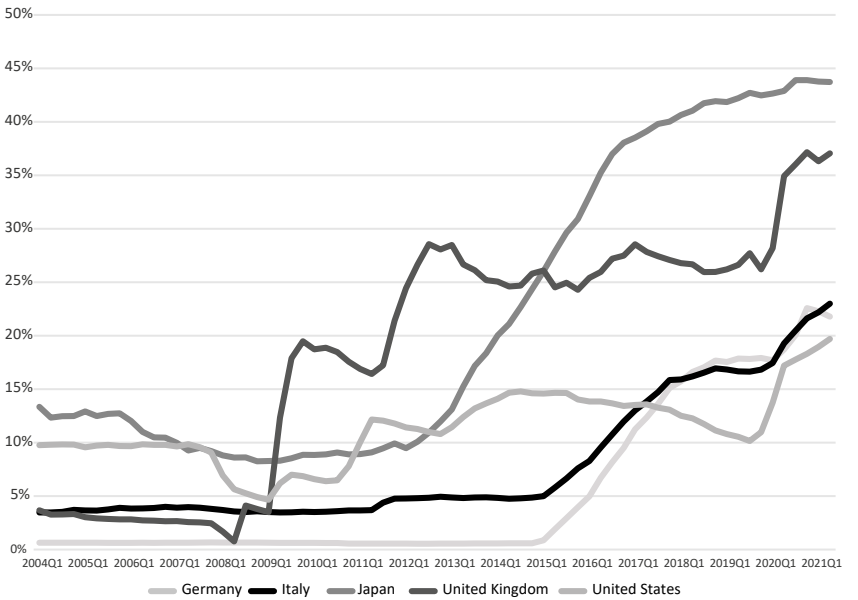
V. The ECB, Public Debt and QE

According to the institutional setting of the EMU, monetary dominance has been prescribed. The ECB statute determines that it is the main goal of the ECB to stabilize the price level. The ECB's support for general economic policy is restricted to areas where there is no conflict with this primary goal. Until recently, the crucial instrument for stabilizing the price level was the main rate for refinancing operations.

However, at the zero lower bound, i. e., a central bank main rate of zero, no further decreasing of the nominal interest rate is possible. In order to increase inflation expectations in the direction of the target price level, quantitative easing (QE) has been invented and employed by central banks worldwide. QE was launched in the eurozone in March 2015 (*Horst/Neyer* 2019, p. 242). The result of this policy is shown in figure 1 for Germany, Italy, Japan, UK and the U.S.

The national central bank debt holdings for 12 countries of the eurozone as a percentage of the general government gross debt is presented in Table 1. Furthermore, the respective debt holding shares of domestic banks, domestic nonbanks and foreign debt holding shares are shown.

The shares of government debt that have been bought by the central banks of the euro system differ starkly between countries. Obviously, the shares do not match the national equity shares of the ECB's capital (*Havlik/Heinemann* 2021). Moreover, very different shares of government debt are owned by domestic banks and nonbanks (i. e., subtract the foreign debt holdings in Table 1 from 100 %). These shares range from 19 % (Greece) to 70 % (Italy). Table 2 shows how the debt shares of national central banks of the eurozone's crisis states (Greece, Ireland, Italy, Portugal and Spain) developed between 2004 and 2020.



Source: IMF (2021), Table 3.1.

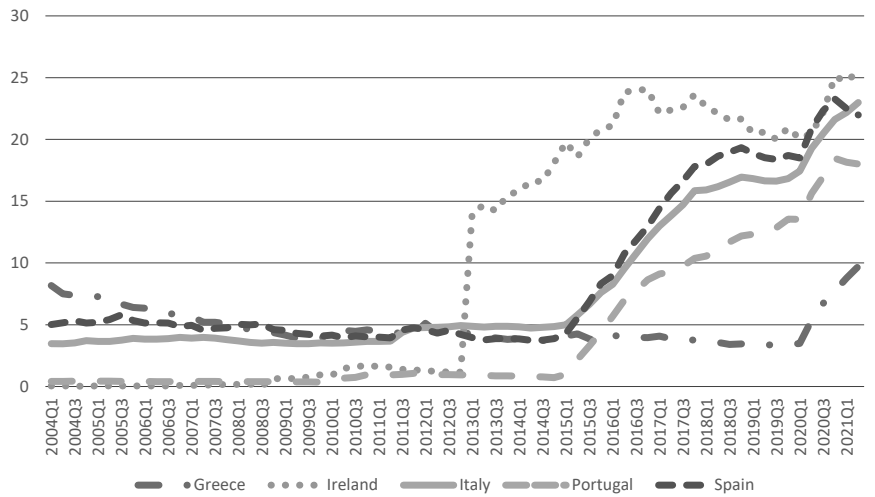
Figure 1: Shares of National Government Debt Held by National Central Banks

Table 1

Shares of General Government Gross Debt Holdings and ECB Capital Shares

Country	Domestic central bank (percent)	Domestic banks (percent)	Domestic nonbanks (percent)	Foreign debt holdings (percent)	ECB capital shares (percent)
Austria	20	11	10	59	2.93
Belgium	15	12	21	52	3.64
Finland	21	14	8	57	1.84
France	17	15	22	46	20.42
Germany	22	21	11	46	26.36
Greece	10	9	0	81	2.47
Ireland	26	8	3	63	1.69
Italy	23	25	22	30	16.99
Netherlands	24	15	26	37	5.86
Portugal	18	14	20	49	2.34
Slovenia	26	11	10	53	0.48
Spain	22	21	15	41	11.92

Source: IMF (2021), Tables (in above order of appearance): 3.1; 3.2; 3.3; 2.2; data for 2021Q2. ECB capital shares (as of 01.02.2020): ECB.



Source: IMF (2021), Table 3.1.

Figure 2: Shares of Eurozone National Government Debt Held by National Central Banks: Greece, Ireland, Italy, Portugal and Spain

The conclusion from this data is that the ECB finances states via its QE monetary policy, at least economically (if not legally). But the ECB also bought a lot of the remaining eurozone states' debt (see Table 1). In this way, it monetized part of the eurozone's public debt. If one considers the public sector purchases programme (PSPP), the ECB's pandemic emergency purchasing programme (PEPP) plus the EU's NextGen-Europe funds, then the way has been paved to euro bonds. The question is, nevertheless, whether these policies indicate fiscal dominance or the complete integration of fiscal and monetary policy, as intended by the MMT policy programme.

VI. Is MMT Relevant in/for Monetary Policy in the Eurozone?

In effect, the crucial question is whether the ECB can still be characterized as an independent central bank (*Neyer* 2019). If it is still independent from politics, it does not meet the criteria of MMT. The latter requires that a central bank is more like a department of the treasury than an autonomous monetary institution. *Neyer* (2019) concludes that it is somehow inconclusive since the PSPP (and more recently PEPP) as well as the Single Supervisory Mechanism (SSM) are critical to the ECB's independence. The review by *de Haan* (2019) did not find clear evidence of a loss of independence of the ECB. Balls et al. (2018, p. 2) found that there are indications that "operational independence" (the selection

of adequate tools for combatting inflation[3]) – even with low "political independence" (no political influence of central bank's policy goals and personnel) – has been the key to low rates of inflation in advanced economies, at least before the financial crisis (ibid., p. 56). However, a caveat is added for the coordination of monetary and fiscal policies: "A coordination mechanism should be established that respects the following three principles. It should be triggered by the central bank, protect democratic control over fiscal policy and be limited to the zero lower bound" (ibid., p. 57). The last of these principles is of crucial importance for the ECB. Since the strong increase in the inflation rate in 2022, there is no longer a zero lower bound for the main ECB interest rate. As a consequence, monetary-fiscal coordination should be halted immediately.

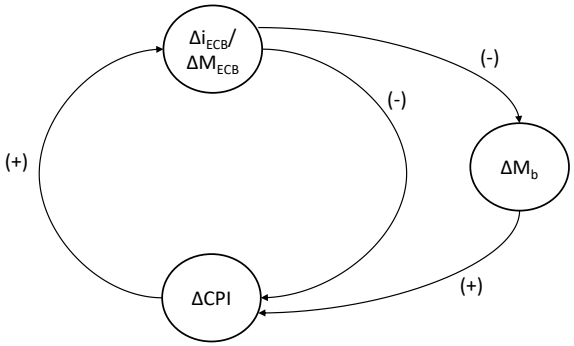
Central banks may have high degrees of political and operational independence on paper and yet de facto no such independence. This can occur when central bank presidents and board members understand themselves more as politicians than as experts in monetary policy. Concerning the ECB, it seems possible that governors of member states' national central banks and ECB board members decide on monetary policy by taking account of the government debt of their home countries. Such a propensity was found by *Heinemann/Kemper* (2021) in connection with the ECB's PEPP.

To consider the crucial question of whether the ECB can effectively combat inflation further, feedback loops are considered next. The intention is firstly to differentiate between four feedback loops in the following. Then the relevance of these loops for MMT is discussed. Since MMT protagonists aim at an integration of fiscal and monetary policy – with fiscal policy as the leader – the feedback loops of monetary policy with fiscal policy as well as financial markets are relevant in this respect.

To start with, it is assumed that inflation is "always and everywhere a monetary phenomenon" (*Friedman* 1970, p. 24). Then the task of the ECB is easy, as shown in figure 3. In order to get inflation – measured by the consumer price index, CPI – under control, the main interest rate, i_{ECB}, or the quantity of money, M_{ECB}, is adjusted accordingly (Δi_{ECB} , ΔM_{ECB}).[4] An increase in the interest rate, $\Delta i_{ECB} > 0$ (a decrease in the quantity of money, $\Delta M_{ECB} < 0$), briefly a contractive monetary policy, has a negative effect on the change in the CPI, i. e., it will decline: $\Delta CPI < 0$. This is indicated by a negative sign (–) in figure 3 beside the arrow from $\Delta i_{ECB}/\Delta M_{ECB}$ to ΔCPI. Moreover, an increase in the CPI, $\Delta CPI > 0$, induces an increase in the interest rate of the ECB or a decrease in the quantity of money, i. e., a contractive policy. A positive sign (+) beside the

[3] See *Balls* et al. (2018), p. 2. Operational independence has also been called "instrument and goal independence" (*Neyer* 2019, pp. 43 f.).

[4] To avoid any misunderstanding, note that according to *Friedman*, the *quantity of money* (and not the interest rate) is the crucial control variable for inflation.



Source: Own depiction.

Figure 3: Anti-Inflationary Monetary Policy in the Simplest Case

arrow from ΔCPI to $\Delta i_{ECB} / \Delta M_{ECB}$ symbolizes this. Furthermore, a contractive (expansive) ECB policy decreases (increases) the possibilities of the banking system to create bank money, ΔM_b. This is indicated in figure 3 by the arrow from the ECB's monetary policy tools (interest rate, quantity of money) to bank money. This mechanism can intensify the effect of ECB policy, but may also attenuate it (a positive sign is attached to the arrow from ΔM_b to ΔCPI in figure 3 nonetheless).

However, nowadays, and particularly in the EMU, it cannot be taken for granted that Friedman's dictum still holds. Figure 4 depicts a scenario that seems more likely in the EMU as well as elsewhere. Note that, for the sake of readability, bank money is not included in this figure; see figure 5 for the role of bank

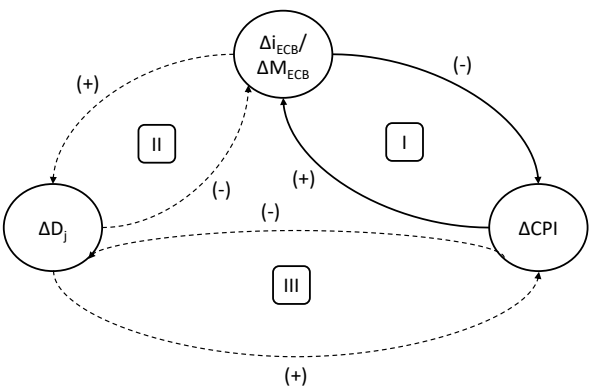


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Figure 4: Anti-Inflationary Monetary Policy with Fiscal Effects

money. Moreover, in this figure and all following figures, primary effects are indicated with solid lines and secondary effects with dashed lines.

The right-hand side of figure 4 shows the feedback loop between CPI changes and ECB's policy responses (interest rate, quantity of money), as in figure 3, identified by a square-framed I. In accordance with EMU reality, a large number of countries are heavily indebted, as measured by their debt-to-GDP ratios. Therefore, two further feedback loops have been added. On the left-hand side of figure 4, a feedback loop between the change to ECB policy and the changes to the debt-to-GDP ratios for countries *j*, denoted by ΔD_j, is included. It is identified by a square-framed II. An increase in the interest rate (or a decrease in the quantity of money) leads *ceteris paribus* to an increase in debt-to-GDP ratios because governments have to pay higher interest rates on bonds when they revolve existing debt or emit new debt. Of course, an increase in financing costs of government debt should incentivize lower debt-to-GDP ratios. Nevertheless, the first effect for highly indebted countries may be to increase the debt-to-GDP ratio. This is indicated by the positive sign (+) on the arrow from $\Delta i_{ECB} \,/\, \Delta M_{ECB}$ to ΔD_j. The response to such a financing costs increase could be that politicians try to force the ECB either to enact a less intensive anti-inflationary policy than required to bring inflation under control. This is indicated by the negative sign (–) on the arrow from ΔD_j to $\Delta i_{ECB} \,/\, \Delta M_{ECB}$.

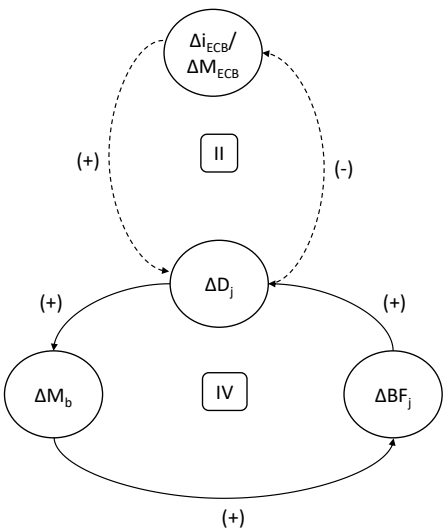
A third feedback loop exists between ΔCPI and ΔD_j, identified in figure 4 by a square-framed III. Increases in the rate of inflation, $\Delta CPI > 0$, decrease the real value of government debt, $\Delta D_j < 0, \forall j$. This is indicated by a negative sign (–) on the arrow between ΔCPI and ΔD_j. Since ECB policymakers are aware of this channel, members from highly indebted countries may try to convince the governing council not to combat inflation or to combat it less intensively, as indicated before by the respective arrow from ΔD_j to $\Delta i_{ECB} \,/\, \Delta M_{ECB}$.

This transmission channel works also in the reverse direction. An increase in the debt-to-GDP ratio in a highly indebted country may trigger a higher rate of inflation, as explained by the Fiscal Theory of the Price Level (FTPL). This theory says that inflation is 'always and everywhere a fiscal phenomenon', to paraphrase Friedman's dictum (see, for instance, *Leeper/Yun* 2006; *Cochrane* 2022).[5] Assuming that the country's available and expected future primary surplus does not increase, deteriorating public finances may make it necessary to reduce the present value of the bonds by a higher rate of inflation. Historical long-term experiences support this (see *Brunnermeier* 2021, 204 f. and figure 12-8, p. 205). At first glance, this does not seem possible in the EMU, since the member coun-

[5] New empirical evidence (*Banerjee* et al. 2022) suggests that an increase in public debt increases the rate of inflation, whereby the size of the effects depends on countries' fiscal and monetary regimes.

tries do not have their own currencies. However, a political transmission channel may make this possible. Central bankers from high-debt countries may vote on the ECB's governing council to combat inflation less aggressively than colleagues from low-debt countries. If the former group has a majority, higher inflation rates may be the consequence. This fits with the dictum that inflation is "always and everywhere a political phenomenon" (*Brunnermeier* 2021, p. 205).

Up to this point, financial markets have not been considered here. Experiences after the financial crisis led to the inclusion of these markets in analyses of monetary policy. In particular, financial stability became a major concern. A crucial risk is that government debt and banking stability create what is known as a "doom loop" (*Fahri/Tirole* 2018, paper title) feedback structure, also dubbed "diabolic loop" (*Cooper/Nikolov* 2018, p. 4). In figure 5, a doom loop feedback slope, identified by a square-framed IV, is depicted (in addition to feedback loop II of figure 4). Note that all signs in frame IV are positive (+); this means that all feedbacks are positive and therefore self-reinforcing.



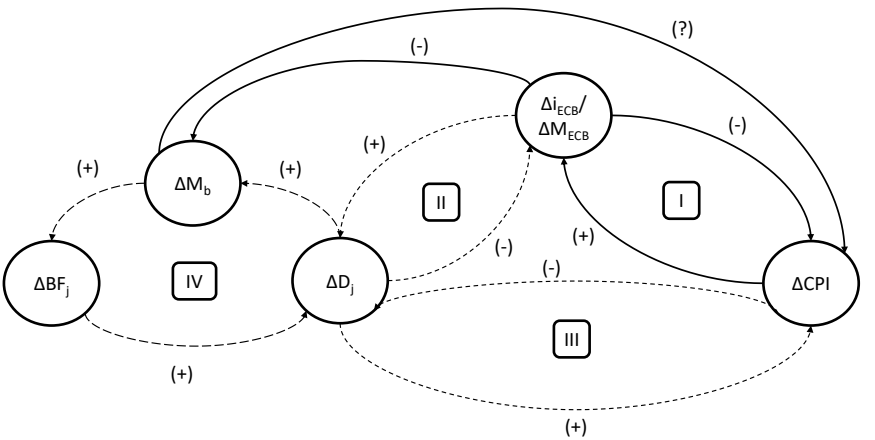
Source: Own depiction.

Figure 5: Anti-Inflationary Monetary Policy and Banking Fragility

Assume that an increase in the ECB's interest rate (a decrease in ECB money), enhances debt-to-GDP ratios, ΔD_j, in highly indebted countries. Banks in the respective countries may be induced to buy the additional government bonds without increasing their equity (since government bonds are considered to be risk-free assets). Bank money is raised in these countries, with government bonds as offsetting entries in bank balance sheets. In this way, the sovereign de-

fault risk is delegated to banks, and this can make banks more fragile (*Cooper/Nikolov* 2018), indicated by ΔBF_j in figure 5.[6] In the case of an impending bank collapse or a banking crisis, the respective governments may need additional credit to bail out banks that are too big to fail or system relevant, as indicated by the arrow from ΔBF_j to ΔD_j. Such credits or money can only be provided by the ECB, which must bear the resulting sovereign default risk (see *Uhlig* 2013 for a formal model). In such a way, the debt-induced increase in bank money in the respective states in retrospect forces a financing with ECB money.

To discuss the above feedback loops in an MMT context, all four feedback loops are depicted together in figure 6.



Source: Own depiction.

Figure 6: Anti-Inflationary Monetary Policy with Fiscal and Banking Effects

The first observation is that MMT only considers feedback loops I and II in figure 6. It criticises that the ECB uses its interest rate to control inflation and that governments are forced to pay interest to get the money they created back, in the form of credits. MMT's radical idea is to combine monetary and fiscal policy by giving up government bonds and replacing them (as well as taxation) with money creation. However, as indicated by the arrows between Δi_{ECB}, ΔM_{ECB}, ΔM_b and ΔCPI, MMT misses the effects of changes in the ECB interest rate and ECB money on bank money as well as the effect of bank money changes on the inflation rate. Bank money can either reinforce the effect of the ECB's policy, attenuate it, or even reverse the ECB's policy effect. In Fig-

[6] Of course, this is not the only mechanism for instability in financial markets, but it is a unique issue in a monetary union with otherwise sovereign member states.

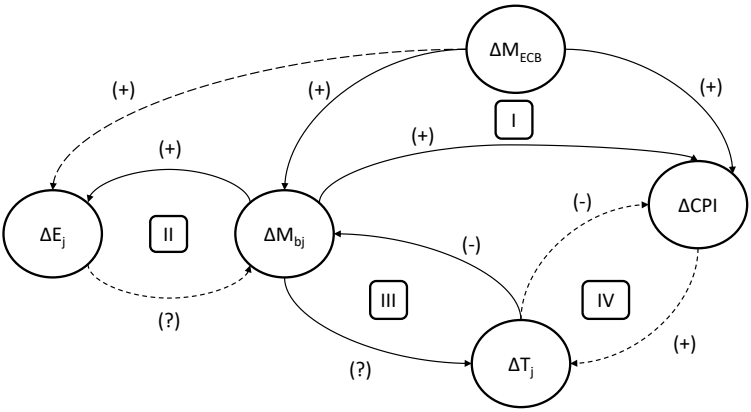
ure 6, this is indicated by a question mark, (?), on the arrow from bank money to the change in the inflation rate.

In contrast to figure 6, figure 7 depicts fiscal and monetary policy from an MMT perspective. In addition to an exclusively MMT diagram, *bank money* is included. In detail, figure 7 can be interpreted as follows. EMU member states obtain money from the ECB, ΔM_{ECB}, for their individual public expenditures whose volumes are approved by a *Joint EMU Treasury*.[7] The latter is a crucial institutional innovation. The reason to implement it nonetheless in figure 7 is that MMT requires such a treasury in order to finance all public expenditures with central bank money. Moreover, the ECB must be integrated into the Joint EMU Treasury, too. If it would not be integrated, the ECB could conduct monetary policy with its own objectives.

In figure 7, an increase in ΔM_{ECB} is assumed to increase the potential for bank money in the respective EMU countries j, ΔM_{bj} (loop I). This is indicated by the respective sign on the arrow between ΔM_{ECB} and ΔM_{bj}. The total increase in money, $\Delta M_{ECB} + \sum_j M_{bj}$, can have positive effects on employment in the respective countries, i. e., $\Delta E_j > 0$, as long as there is no full employment yet (loop II). Whether there is a feedback loop from employment to bank money is unclear and therefore indicated with a question mark, (?). If there is already full employment, $\Delta M_{ECB} + \sum_j M_{Bj}$ will increase the rate of inflation, as shown by the arrows from ΔM_{ECB} and M_{bj} to ΔCPI (loop I).

Nevertheless, the change in ECB money, ΔM_{ECB}, as well as the changes in bank money in the EMU member states, $\sum_j \Delta M_{bj}$, may also change the consumer price index (CPI), though probably only slightly. In contrast to conventional monetary policy, in MMT the ECB loses its function as an independent monetary authority that is responsible for a stable price level. Instead – and this seems to be the weakest point in the MMT architecture applied to the EMU – the member countries are responsible for a stable price level, as indicated by the feedback loops III and IV in figure 7. The need for two feedback loops demonstrates that the control of inflation is the crucial shortcoming of MMT. Feedback loop III shows the connection between changes in bank money in country j and

[7] See *Bibow* (2015, p. 1) who recommends "a Euro Treasury as a vehicle to pool future eurozone public investment spending and to have it funded by proper eurozone treasury securities" and *Hellwig* (2017) for a discussion of the usefulness of a treasury for a European banking union. Even the follow-up communication of the European Commission to the so-called "Five Presidents' Report" of 2015 says: "In addition, a euro-area Treasury could take shape, to access financial markets on behalf of its members to fund part of their regular refinancing needs" (European Commission 2019, p. 12).



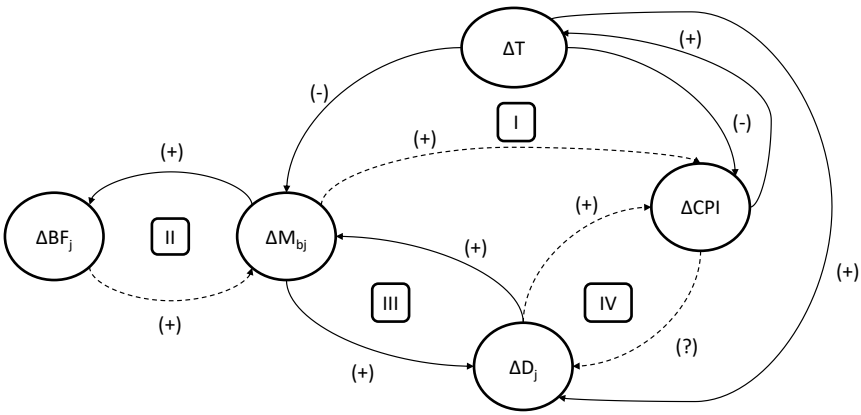
Source: Own depiction.

Figure 7: EMU Fiscal-Monetary Policy in MMT

the according changes in tax revenues, ΔT_j, in this country. However, it is unclear whether the change in bank money has an impact on tax revenues. Therefore, a question mark (?) is attached to the respective arrow. By contrast, an increase in tax revenues in order to reduce inflation reduces bank money (i. e., higher taxes to combat inflation crowds out investments that would be financed by bank money otherwise), as shown by the signs on the arrows in feedback loop III. The use of taxation to reduce inflation is shown in feedback loop IV. A tax increase reduces CPI as well as, according to MMT, a significant increase in CPI must lead to tax increases, to combat inflation. This explains the arrows and their signs in feedback loop IV.

However, as a single country j, it is not possible to control the rate of inflation in the country without an own currency. Therefore, inflation control is a public good in the EMU, as shown in feedback loop IV. For each individual country j, there is no incentive to tax its own population in order to control union-wide inflation. The most likely outcome would be too high rates of inflation, since nobody is responsible for a stable price level. In effect, a complete MMT policy implementation in the EMU must assign at least one tax to the Joint EMU Treasury. The main aim of this tax – for instance, a surcharge on the countries' income taxes or an additional EMU value-added tax – is to control inflation. Of course, such a tax will increase the tax revenues in the individual EMU member states, ΔT_j, but the ultimate receiver is the Joint EMU Treasury.

Note that the individual member states may react to a tax increase of the Joint EMU Treasury by reducing their own taxes. Otherwise, a member state may also increase its public debt in such a situation (if further such debt will be allowed) in order to finance the additional tax, as depicted in figure 8. This figure



Source: Own depiction.

Figure 8: Free Riding in an EMU with MMT Design

is based on elements of figure 6 as it contains a doom loop II, connected with public debt, ΔD_j. Moreover, inflation is combatted by means of an EMU tax increase, ΔT. ECB money is therefore not included in figure 8.

As indicated by the arrows, higher EMU tax, $\Delta T > 0$, reduces firstly the potential to create bank money, ΔM_{bj}. Secondly, it reduces the CPI by lowering aggregate demand. Assume now that the additional EMU tax is paid by credits from banks in the respective country by creating additional bank money. This is possible, although while the EMU tax reduces the potential for creating bank money, it does not eliminate it. Since no equity is required to secure credits to the government, government bonds are the assets with which the credit is secured. This gives doom loop II new impetus and the fragility of banking, ΔBF_j, in this country increases. Moreover, the higher public debt in country j can even increase the CPI somewhat. In effect, this example demonstrates that public debt and combatting inflation remain major issues in the EMU as they are prone to free riding by member states. Moreover, figure 8 shows that the ability of banks to create money is a decisive feature of the monetary economy that is missing in MMT. Bank money renders increases in country-level public debt possible that may enhance bank fragility when the domestic banks finance and hold the corresponding government bonds. Furthermore, it also proves that money is not only a creature of the state, as supposed by MMT.

To summarize, a full application of MMT in the EMU does not seem possible. Even if public expenditures, financed by money creation, were approved by a new Joint EMU Treasury, individual countries may get around policy measures of inflation control. For MMT to become an option for the EMU, individual member states must give up their sovereignty to a large extent.

A further remark is worthwhile. MMT only considers fiscal and monetary dominance. Financial markets, as well as financial fragility, are not considered within MMT. This is another shortcoming of MMT as a foundation of public policy, as indicated by doom loop IV in figure 6 and doom loop II in figure 8.

The remaining question is, however, how far the EMU and the ECB have moved towards MMT in recent times. First of all, even large-extent debt monetization is not an MMT policy. The reason for this is that in the EMU, the ECB decides for itself whether and to what extent debt is monetized (see *Treptow* 2022 for a different view). Furthermore, the ECB must not select the debt of highly indebted countries with priority in the existing QE programmes. Nevertheless, this comes with a caveat. With PSPP, PEPP, OMT and in particular with the new Transmission Protection Instrument (TPI)[8], the ECB seemingly submits to fiscal dominance, which is not so far away from MMT ideas. Put differently, the ECB is in danger of becoming a *political institution* and may lose its operative independence. If this happens, it loses its credibility. The ECB will then assume the tasks of national fiscal policy.

Finally, MMT provides more of an institutional framework for a 'new brave money world' than a blueprint for alternative monetary and fiscal policies.

VII. Conclusion

It is tempting to declare that everything that is politically desirable can also be financed, simply by creating the required money. In addition, neither taxes nor bonds are necessary because they do not finance public expenditures. If this sounds like a fairy tale, then it is because it is a fairy tale. Even in MMT money, created to finance public expenditures, is only a zero bond, emitted as a tax credit (*Ehnts/Paetz* 2019). By contrast, the crucial message of MMT is to change the contemporary responsibilities for monetary and fiscal policy, mainly in the U.S. but also in the EMU. The proposed change is radical as it demands the unification of monetary and fiscal policy, with a dominant position for fiscal policy. Of course, such a change requires a sovereign and economically strong country with its own currency. Only such countries are immune to sovereign default because they can always inflate away any public finance problem.

MMT gained momentum, at least in the U.S., in the aftermath of the financial crisis in the years since 2008 as the world's most relevant central banks enacted a new era in monetary policy with QE. When the interest rate as the price of

[8] "Subject to fulfilling established criteria, the Eurosystem will be able to make secondary market purchases of securities issued in jurisdictions experiencing a deterioration in financing conditions not warranted by country-specific fundamentals, to counter risks to the transmission mechanism to the extent necessary" (*ECB* 2022).

money became zero, money became priceless though not worthless. QE looked like a scaled-down version of MMT. With a supply of money to a price of zero, every environmental, social, etc. political project seemed fundable. Whether full employment guarantees or green new deals, anything was attainable.

The applicability of MMT in the EMU is studied in this paper. The institutional setting of the EMU is considerably different to the setting in the U.S. The ECB is responsible for monetary policy in order to stabilize the price level, whereas the sovereign EMU member states are responsible for their fiscal policy. As a consequence, all government debt is denominated in a currency that cannot be manipulated by a member state. This setting is incompatible with the division of responsibilities in MMT. MMT requires not only an own currency, but also that inflation is controlled by taxation. However, the member states of the EMU also enjoy sovereignty concerning their tax policy. Since price level stability is an EMU-wide public good, it is impossible for single EMU members to stabilize the price level through their individual taxes.

Nevertheless, QE policies and the additional monetary policy measures introduced by the ECB have changed the nature of EMU monetary policy. Institutionally, the ECB has neither a mandate for fiscal policy nor is it allowed to finance EMU governments. Among the most critical instruments in this respect are PSPP, PEPP, OMT and the new TPI. With these instruments, the ECB has become a fiscally dominant central bank. However, fiscal dominance in monetary policy is not sufficient for the MMT concept.

References

Acharya, V./*Pierette*, D./*Steffen*, S. (2021): Lender of Last Resort, Buyer of Last Resort, and a Fear of Fire Sales in the Sovereign Bond Market. Financial Markets, Institutions & Instruments, 30, 87 – 112.

Åslund, A. (2012): Why a Breakup of the Euro Area Must be Avoided: Lessons from Previous Breakups. Peterson Institute for International Economics, Policy Brief No. PB 12 – 20, August 2018.

Balls, E./*Howat*, J./*Stansbury*, A. (2018): Central Bank Independence Revisited: After the Financial Crisis, What Should a Model Central Bank Look Like? Mossavar-Rahmani Center for Business & Government Associate Working Paper Series No. 87, Harvard Kennedy School of Government.

Beck, H./*Prinz*, A. (2019): Wie revolutionär ist die Modern Monetary Theory? Wirtschaftsdienst, 99(6), 415 – 420.

Beck, H./*Prinz*, A. (2022): Gefahr für unser Geld? Die neuen Propheten des Geldes und die Zukunft unseres Währungssystems, Vahlen, Munich.

Bibow, J. (2015): Making the Euro Viable: The Euro Treasury Plan. Levy Economics Institute of Bard College, Working Paper No. 842.

Bonefeld, W. (2018): Stateless Money and State Power: Europe as Ordoliberal Ordnungsgefüge. History of Economic Thought and Policy, 2018 (1), 5 – 26.

Bordo, M. D./*Jonung,* L./*Markiewicz,* A. (2013): A Fiscal Union for the Euro: Some Lessons from History. CESifo Economic Studies, 59(3), 449 – 488.

Brunnermeier, M. (2021): Die resiliente Gesellschaft, Aufbau Verlag, Berlin.

Chari, V. V./*Kehoe*, P. J. (2007): On the Need for Fiscal Constraints in a Monetary Union. Journal of Monetary Economics, 54, 2399 – 2408.

Chari, V. V./*Kehoe*, P. J. (2008): Time Inconsistency and Free-Riding in a Monetary Union. Journal of Money, Credit and Banking, 40(7), 1329 – 1355.

Cochrane, J. (2022): Inflation Past, Present and Future: Fiscal Shocks, Fed Responses, and Fiscal Limits. NBER Working Paper 30096.

Cooper, R./*Nikolov*, K. (2018): Government Debt and Banking Fragility: The Spreading of Strategic Uncertainty. European Central Bank Working Paper Series 2195.

De Haan, J. (2019): Some Reflections on the Political Economy of Monetary Policy. Review of Economics, 70(3), 213 – 228.

De Jong, J. F. M./*Gilbert*, N. D. (2020): Fiscal Discipline in EMU? Testing the Effectiveness of the Excessive Deficit Procedure. European Journal of Political Economy, 61, 101833.

Draghi, M. (2012): Rede vom 26.07.2012. Available at: www.ecb.europa.eu/press/key/date/2012/html/sp120726.en.html.

Dröge, S. (2022): Der europäische Green Deal. Aus Politik und Zeitgeschichte, 72(3 – 4), 24 – 30.

Ehnts, D. (2022): Modern Monetary Theory. Eine Einführung. Springer, Heidelberg.

Ehnts, D./*Hoefgen*, M. (2022): Was ist Modern Monetary Theory? Perspektiven der Wirtschaftspolitik, 23(2), 108 – 119.

Ehnts, D./*Paetz*, M. (2019): Die Modern Monetary Theory: Staatsschulden als Steuergutschriften. Vierteljahreshefte zur Wirtschaftsforschung, 88, 77 – 90.

Epstein, G. A. (2019): What's Wrong with Modern Money Theory? A Policy Critique. Cham, Switzerland: Palgrave Macmillan.

Epstein, G. A. (2020): The Empirical and Institutional Limits of Modern Money Theory. Review of Radical Political Economics, 52(4), 772 – 780.

European Central Bank (ECB) (2019): What is a Lender of Last Resort? Available at: www.ecb.europa.eu/ecb/educational/explainers/tell-me-more/html/what-is-a-lender-of-last-resort.en.html (Accessed on 22 July 2022).

European Central Bank (ECB) (2021): An Overview on the ECB's Monetary Policy Strategy. European Central Bank, Frankfurt am Main.

European Central Bank (ECB) (2022): The Transmission Protection Instrument. Available at: www.ecb.europa.eu/press/pr/date/2022/html/ecb.pr220721~973e6e7273.en.html (Accessed on 28 July 2022).

European Commission (2019): Deepening the EU's Economic Monetary Union: Taking Stock Four Years After the Five Presidents' Report. Communication from the Commission to the European Parliament, the European Council, the Council and the Euro-

pean Central Bank. Available at: https://commission.europa.eu/documents_en?f%5B0%5D=document_title%3Afive%20presidents%20report (Accessed on 20 December 2022).

Fahri, E./*Tirole*, J. (2018): Deadly Embrace: Sovereign and Financial Balance Sheets Doom Loops. Review of Economic Studies, 85(3), 1781 – 1823.

Forstater, M. (2010): Functional Finance and Full Employment: Lessons from Lerner for Today. In: Nell, E. J./Forstater, M. (eds.), Reinventing Functional Finance. Edward Elgar, 160 – 170.

Freixas, X./*Rochet*, J.-C./*Parigi*, B. M. (2004): The Lender of Last Resort: A Twenty-First Century Approach. Journal of the European Economic Association, 2(6), 1085 – 1115.

Friedman, M. (1970): The Counter-Revolution in Monetary Theory. Wincott Memorial Lecture, Institute of Economic Affairs, Occasional paper 33.

Galvin, R./*Healy*, N. (2020): The Green New Deal in the United States: What it is and How to Pay for it. Energy Research and Social Science, 67, 101529.

Hansen, P. H. (2014): From Finance Capitalism to Financialization: A Cultural and Narrative Perspective on 150 Years of Financial History. Enterprise & Society, 15(4), 605 – 642.

Havlik, A./*Heinemann*, F. (2021): Sliding Down the Slippery Slope? Trends in the Rules and Country Allocations of the Eurosystem's PSPP and PEPP. Credit and Capital Markets, 54(2), 173 – 197.

Heinemann, F./*Kemper*, J. (2021): The ECB Under the Threat of Fiscal Dominance – The Individual Central Banker Dimension. The Economists' Voice, 18(1), 5 – 30.

Heise, A. (2022): Modern Monetary Theory. Der keynesianische Stein der Weisen oder Voodoo-Ökonomik. Berliner Debatte Initial, 33(2), 79 – 92.

Hellwig, M. (2017): A Treasury for the European Banking Union? Slides, MPI for Research on Collective Goods.

Holtz-Eakin, D./*Bosch*, D./*Gitis*, B./*Goldbeck*, D./*Rossetti*, P. (2019): The Green New Deal: Scope, Scale, and Implications. Available at: www.americanactionforum.org/print/?url=https://www.americanactionforum.org/research/the-green-new-deal-scope-scale-and-implications (Accessed on 28 January 2022).

Horst, M./*Neyer*, U. (2019): The Impact of Quantitative Easing on Bank Loan Supply and Monetary Policy Implementation in the Euro Area. Review of Economics, 70(3), 229 – 265.

IMF (2021): Sovereign Debt Investor Base for Advanced Economies. Version dated 1 November 2021.

Juncker, J.-C./*Tusk*, D./*Dijsselbloem*, J./*Draghi*, M/*Schulz*, M. (2015): Completing Europe's Economic and Monetary Union, European Commission, available at: https://ec.europa.eu/info/sites/default/files/5-presidents-report_en.pdf (Accessed on 22 July 2022).

Kelton (née Bell), S. (2000): Do Taxes and Bonds Finance Government Spending? Journal of Economic Issues, 34(3), 603 – 620.

Kelton, S. (2020): The Deficit Myth. Modern Monetary Theory and How to Build a Better Economy, John Murray, London.

Leaman, J. (2022): Einige kritische Reflektionen über die Modern Monetary Theory. Berliner Debatte Initial, 33(2), 93 – 104.

Leeper, E. M./*Yun*, T. (2006): Monetary-Fiscal Policy Interactions and the Price Level: Background and Beyond. International Tax and Public Finance, 13, 373 – 409.

Leiner-Killinger, N./*Nerlich*, C. (2019): Fiscal Rules in the Euro Area and Lessons from Other Monetary Unions. ECB Economic Bulletin, Issue 3/2019.

Lerner, A. P. (1943): Functional Finance and the Federal Debt. Social Research, 10(1), 38 – 51.

Losse, B. (2022): Ökonom Issing warnt vor dem Hype um die „Modern Monetary Theory", Wirtschaftswoche Online, available at: www.wiwo.de/politik/ausland/alternative-geldpolitik-mmt-oekonom-issing-warnt-vor-dem-hype-um-die-modern-monetary-theory/26290998.html (Accessed on 21 November 2022).

Mehring, P. (2010): Functional Finance, Past and Present. In: Nell, E. J./Forstater, M. (eds.), Reinventing Functional Finance. Edward Elgar, 83 – 88.

Mosler, W. (1997): Full Employment and Price Stability. Journal of Post Keynesian Economics, 20(2), 167 – 182.

Negishi, T. (1979): Microeconomic Foundations of Keynesian Macroeconomics. North-Holland, Amsterdam, New York, Oxford.

Neyer, U. (2019): The Independence of the European Central Bank. Credit and Capital Markets, 52(1), 35 – 68.

Palley, T. (2013): Financialization: The Economics of Finance Capital Domination, Macmillan Palgrave, New York.

Papadia, F. (2014): Lending of Last Resort? A European Perspective. In: Bank for International Settlements (BIS) (ed.), Re-thinking the Lender of Last Resort. BIS Papers 79, 93 – 96.

Prinz, A./*Beck*, H. (2021): Modern Monetary Theory: A Solid Theoretical Foundation of Economic Policy? Atlantic Economic Journal, 49 (2), 173 – 186.

Rohwer, G./*Behr*, A. (2021): Financial Capital. Data and Models. UVK Verlag, Munich.

Sawicky, M. (2019): There Are Limits to Government Spending, But We Haven't Reached Them Yet. In These Times. Available at: https://inthesetimes.com/article/paygo-modern-monetary-theory-pelosi-keynes (Accessed on 21 November 2022).

Schlotmann, O. (2021): Is Now Time for Modern Monetary Theory or Permanent Monetary Finance? Credit and Capital Markets, 54(1), 17 – 36.

Uhlig, H. (2013): Sovereign Default Risk and Banks in a Monetary Union. German Economic Review, 15(1), 23 – 41.