Fighting Inflation without Massive Transfers to Banks*

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The major central banks now operate in a regime of abundant bank reserves. As a result, they can only raise the money market rate by increasing the rate of remuneration of bank reserves. This, in turn, leads to large transfers of central banks' profits to commercial banks that will become unsustainable and renders the transmission of monetary policies less effective. We propose a two-tier system of reserve requirements that would only remunerate the reserves in excess of the minimum required. This would drastically reduce the giveaways to banks, allow the central banks to maintain their current operating procedures and make monetary policies more effective in fighting inflation.

Journal of Economic Literature (JEL) codes: E42, E52, E58

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1. Introduction

The major central banks pay interest on commercial banks' holdings of bank reserves held at the central bank (see *Table 1*). In order to fight inflation, these central banks have started to raise interest rates since late 2021. Taking the example of the Eurosystem: bank reserves held by credit institutions at the national central banks and the ECB amounted to EUR 3.5 trillion in March 2024, while the remuneration rate on these bank reserves held by commercial banks was 4 per cent. This means that the Eurosystem was paying out EUR 141 billion in interest to credit institutions as of March 2024, on a yearly basis.

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Other central banks, in particular the Federal Reserve and the Bank of England, follow the same procedure of raising the interest rate by increasing the rate of remuneration on bank reserves. In *Table 1*, we compare the interest transfers for these three central banks. We find that these transfers to commercial banks have become substantial. The last column of the table shows these interest payments as a percentage of GDP. One observes that, in relative terms, the transfers made by the Bank of England are the highest, followed by the ECB and the US Fed.

Table 1 Bank reserves and interest payments to banks (end-March 2024)									
	Bank reserves (billions)	Interest rate (%)	Interest payments						
			(billions)	Per cent of GDP					
ECB	EUR 3,524	4.00	EUR 141	1.10					
Fed	USD 3,472	5.4	USD 187	0.75					
BoE	GBP 792	5.25	GBP 42	1.75					

Source: Bank of England: Central Bank reserve balances liabilities, Board of Governors of the Federal Reserve System (Federal Reserve Balance Sheet) and European Central Bank (Consolidated financial statement of the Eurosystem. ECB Data Portal.)

To give an idea of the size of these transfers in the Eurozone, consider the following: With a yearly transfer of EUR 141 billion by the Eurosystem to the Eurozone banks, we are approaching the total annual spending of the EU, which amounted to EUR 168 billion in 2022. Although these transfers will decline as a result of falling interest rates and declining levels of bank reserves due to 'quantitative tightening,' they will remain substantial for years to come. This is a remarkable situation, which is even more remarkable when one considers that these transfers by a European institution to the banks are decided without any political discussion and are granted without attaching any conditions. This contrasts with EU spending, which is the result of an elaborate political decision-making process and is usually accompanied by tight conditions.

In this paper, we address a number of issues that arise from these large transfers. In *Section 2*, we review the theoretical idea of the need to remunerate bank reserves. In *Section 3*, we discuss the major problems with the remuneration of bank reserves. Although the interest transfers by central banks occur in most advanced countries (including Hungary, the Czech Republic and other countries in the CEE region) and create similar problems such as large losses for central banks in all of these countries as well, we focus on the Eurozone in this paper and use it as a good example. This allows us to study some of the special problems that arise from these transfers in a monetary union. In *Section 4*, we look at the alternative operating procedures of central banks in their fight against inflation that do not imply massive transfers of central banks' profits to banks. We propose a two-tier system of minimum reserve

requirements as an alternative operating procedure. In *Section 5*, we argue that there is a need to rethink the role of minimum reserves to ensure financial stability. We conclude in *Section 6*.

2. Is the remuneration of bank reserves necessary for monetary policy?

Is the remuneration of bank reserves necessary to conduct monetary policy? The standard answer of many economists and central bankers is positive (see *De Grauwe and Ji 2024b*). Today, there is an oversupply of bank reserves thanks to the large-scale QE operations of the past. There is, in other words, no scarcity of liquidity, but rather an abundance (see, for example, *Bailey 2024*). This creates a problem for the central banks when they want to raise the interest rate. We illustrate this in *Figure 1*. This represents the demand for reserves (by banks) and the supply (by the central bank). The demand is negatively related to the money market interest rate (interbank rate). The supply is determined by the central bank. The latter increases (reduces) the supply by buying (selling) government bonds. *Figure 1* presents the regime of reserve abundance: the central bank has bought large amounts of government bonds in the past and thus created an excess supply of reserves. As a result, without the remuneration of bank reserves, the interest rate.





To raise the interest rate in this reserve abundance regime, the central bank can remunerate bank reserves, which are essentially deposits at the central bank held by commercial banks. In doing so, the demand curve becomes horizontal at the level of the deposit rate, i.e. the deposit rate, r_D , acts as a floor for the interbank interest rate. The reason is that banks will not lend in the interbank market at an interest rate below the (risk-free) deposit rate. Given the abundance of bank reserves, this is the only way to raise the money market interest rate.

An increase in the interest rate on bank reserves (deposit rate) is then transmitted into an increase in the money market interest rate and to the whole structure of interest rates (*Ihrig – Wolla 2020; Baker – Rafter 2022*). Such an increase in the interest rate is necessary to fight inflation. Therefore, in the present regime of reserve abundance, the only way to raise the interest rate is to remunerate banks' reserves and increase this remuneration rate.

Many economists and central bankers today take it for granted that bank reserves are remunerated so as to conduct anti-inflation policy. Yet this remuneration is a recent phenomenon. Prior to the start of the Eurozone in 1999, most European central banks did not remunerate banks' reserve balances. During the 1970s and 1980s, for example, the Bundesbank used very high unremunerated minimum reserve requirements to siphon off large inflows of money into the country (*Schobert – Yu 2014*). The ECB started the practice of remunerating bank reserves in 1999. The Federal Reserve introduced the remuneration of banks' reserve balances only in 2008. Thus, before 2000 the general practice was *not* to remunerate banks' reserve balances. This made good sense: commercial banks themselves do not remunerate demand deposits held by their customers. These demand deposits have the same function as bank reserves at the central bank: they provide liquidity for the non-bank sector. These are not remunerated. It is not easy to justify why bankers should be paid when they hold liquidity, while everybody else should accept not being remunerated.

3. Problems with the remuneration of bank reserves in the current operating regime¹

The large remuneration of bank reserves creates several problems that we discuss in this section. Some of these problems may have political economy implications in the Eurozone.

¹ This section is based on *De Grauwe and Ji* (2024b)

3.1. Large transfers and fiscal implications

First, when the central bank makes interest payments to commercial banks it transfers part of its profits to the banking sector. Central banks make profit (seigniorage) because they have obtained a monopoly from the state to create money. The practice of paying interest to commercial banks thus amounts to transferring this monopoly profit to private institutions. This monopoly profit should be returned to the government that has granted the monopoly rights. It should not be appropriated by the private sector, which has done nothing to earn this profit. The present situation of paying out interest on banks' reserve balances amounts to a subsidy to banks paid out by the central banks at the expense of taxpayers. In *Table 2*, we show the size of the potential annual interest payments of central banks of the Eurosystem. We observe large differences in these transfers by these central banks, varying from 0.43 per cent to 9.15 per cent of GDP. These different levels may reflect different sizes of banking systems and asset structures across different Eurozone countries.

Country	Remuneration (million EUR)	Percentage of GDP
Luxembourg	7,095	9.15
Cyprus	920	3.31
Finland	5,285	1.97
Belgium	10,326	1.88
Netherlands	13,918	1.45
Malta	241	1.40
France	35,925	1.36
Germany	49,107	1.27
Austria	4,108	0.92
Croatia	593	0.87
Estonia	302	0.84
Slovenia	426	0.75
Spain	9,170	0.68
Ireland	3,277	0.65
Portugal	1,434	0.59
Greece	1,201	0.58
Latvia	215	0.55
Lithuania	360	0.53
Slovakia	484	0.44
Italy	8,347	0.43

The payment of interest on banks' reserve accounts has an unfortunate fiscal consequence. It transforms long-term government debt into short-term debt. Most of the government bonds held by the central banks were issued at very low interest rates, often even zero or negative. This implies that governments are immune for some time to interest rate rises. By paying an interest rate of 4 per cent in the Eurozone on bank reserves and thus reducing government revenues by the same amount, the central banks transform this long-term debt into highly liquid debt, forcing an immediate increase in interest payments on the consolidated debt of the government and the central bank. This may contribute to higher budget deficits and increasing government debt, leading to fiscal austerity in some countries. Paradoxically, central banks contribute to a worsening budgetary outlook for the government.

3.2. Large losses of central banks

The large central bank transfers to banks have important implications for the profit and losses of central banks. These transfers are so high that not only do they wipe out central banks' profits, but they also push many of them into loss-making territory (see *Wellink 2003*). This is well-illustrated by the study *Belhocine et al. (2023*), which analyses the profit and loss accounts of five major Eurozone central banks. The authors show that the Bundesbank incurs the largest losses. It is estimated that it will take until 2027 for the Bundesbank to make profits again. The Banque de France is ranked second in the list of central banks with losses. Profitmaking is estimated to start again in 2025. Surprisingly, the Banca d'Italia is the only one of the larger central banks not to suffer losses (although its profits declined in 2022–2023), while the Bank of Spain incurred some small losses in 2023–2024.

The cause of this divergence is the following. The Bundesbank, and to a lesser degree the Banque de France, hold a portfolio of low-yielding long-term government bonds. As a result, interest revenues are very low, and given the long duration of these bonds, it will take time before they start earning interest. This is not the case for the Banca d'Italia and to a lesser degree the Bank of Spain, which hold relatively high-yielding government bonds. It follows that the Bundesbank and the Banque de France have transformed low-yielding long-term government bonds into short-term liabilities (bank reserves) on which they pay high interest rates. This transformation is much less costly in the case of the Banca d'Italia and the Bank of Spain. It is also interesting to note that not only the national central banks within the Eurozone face the issue of large losses, but countries outside the Eurozone as well, such as the National Bank of Hungary and the Czech National Bank, encounter similar challenges.

Belhocine et al. (2023) also show that the cumulative losses can lead to a point where the equity of the central banks turns negative. This is likely to occur in the case of the Bundesbank and possibly the Banque de France. Should one worry about the negative equity of central banks? Not really. Central banks, in contrast to commercial banks, do not need to have positive equity to conduct credible monetary policies. In addition, a more relevant concept of the net worth of central banks is the net present value of future seigniorage gains and losses (see *Buiter* 2008). The cumulative profit and loss profiles shown in *Belhocine et al.* (2023) indicate that the losses are likely to be temporary. As a result, the net present value of future gains and losses is most likely to be positive.

While negative equity does not technically pose problems for a central bank, the political economy of this issue is very different (see *Wellink and Marsh 2023*). The negative equity of the central banks expresses the fact that these are transferring large amounts of money to private agents and incurring large losses in doing so. These losses must be borne by governments and taxpayers. Negative equity (when it may take many years to get equity back to positive) reveals this underlying problem. When this appears in the open, citizens – especially in countries where the central bank incurs larger losses – will ask the question of why it was necessary to enrich the bankers to fight inflation. They will also insist on knowing why the central banks did not look for other operating procedures that were equally effective to combat inflation and that avoided making transfers to banks at the expense of taxpayers.

The ECB has announced that it will gradually reduce its holdings of government bonds by not reinvesting in new bonds when old bonds come to maturity. This will lead to a gradual decline in the amount of government bonds on its balance sheet. It will take many years, however, to reach the point where the excess supply of reserves has been eliminated. Thus, it appears that the Eurozone will remain in a reserve abundance regime for many years to come. This implies that the operating procedure of the ECB (and the other central banks of advanced countries) will continue to be based on manipulating the rate of remuneration of banks' reserves as their central policy tool, which in turn also implies that these central banks intend to continue to make large transfers of their profits to commercial banks for many years to come.

3.3. Central banks have solved the biggest risk of banks

Related to commercial banks, the problematic nature of remunerating bank reserves appears from the following. Banks are 'borrowing short and lending long'. In other words, banks have long assets (with fixed interest rates) and short liabilities. As a result, an interest rate increase may lead to losses and reduces banks' profits because the interest cost of their liabilities may increase quickly in cases of strong competition for liquidity, while interest revenues are slow to pick up. Banks are supposed to hedge this interest rate risk. But this is costly, and as a result, they are often reluctant to buy such insurance. By remunerating bank reserves, the central banks are providing free interest hedging to banks. The latter obtain immediate compensation from the central banks when interest rates rise. The profit and loss profile of the central banks mimics the profit and loss profile of commercial banks during periods of interest increases. Paradoxically, this time banks are escaping the burdensome loss profile as they made large profits during the period of interest rate increases in 2022–2023. This appears to be possible because central banks have taken over this burden from the commercial banks. It is difficult to see the economic rationale of a system where public authorities provide free insurance of the banks' interest rate risks at the expense of taxpayers. It is also worth mentioning that during the 1970s and 1980s when central banks raised interest rates to fight inflation, they did not make losses (*Humann et al. 2023*). They increased their profits. One of the main reasons was that they did not remunerate bank reserves.

This free provision of interest hedging to banks is likely to intensify moral hazard risks. First, the remuneration of reserves reduces banks' incentives to hedge their interest rate risk. The ECB as the single supervisor in the Eurozone requires that banks manage their interest rate risk appropriately. However, when at the same time the ECB remunerates commercial banks' reserves, it undermines its own microand macroprudential supervision objectives. In addition, because the remuneration of reserves will lead to a lower degree of interest rate risk hedging by banks, the central bank will find it increasingly difficult to stop remunerating reserves, as it might fear that the interest rate risk of some banks could materialise, triggering banking crises. Second, as will be shown in *Section 4*, the remuneration of bank reserves to increase the loan supply and weakening the transmission of monetary policy.

3.4. Transmission of monetary policies in the current regime

One important issue is how the existence of remunerated bank reserves affects the transmission of monetary policies. Does remuneration make the transmission of monetary policies effective? In the context of central banks' anti-inflationary policies this question can be reformulated as follows: Does the remuneration of bank reserves enhance or reduce the effectiveness of interest rate hikes to fight inflation?

There is a large economic literature on the equity channel of bank lending which is relevant here. This channel can be described as follows. When a bank's capital (equity) declines, it has an incentive to reduce lending. There are essentially two reasons for this. One is a balance sheet effect. Lower equity means that the bank may not satisfy the capital requirements imposed by regulators. The bank will then have to reduce the supply of loans. The second reason is that with lower equity, the cost of funding bank loans will tend to increase, thereby leading to fewer incentives for banks to lend. Thus, declines in the value of banks' equity lead to less bank lending. Conversely, an increase in the value of equity stimulates banks to lend more (see Shin 2015; Gambacorta and Shin 2016; Van den Heuvel 2002; Diamond – Rajan 2000). This theory has been subjected to many empirical tests confirming its importance (see Boucinha et al. 2017; Girotti – Horny 2020).

This equity channel of bank lending is important in terms of understanding how the remuneration of reserves may affect bank lending. By increasing the profit margins of banks, the use of remunerated minimum reserve requirements tends to increase the net worth (equity) of banks. With a higher equity ratio, banks will be more willing to supply loans to households and firms. Thus, when the central banks raise the interest rate to fight inflation and as a result increase the remuneration of reserves, they give incentives to banks to extend more loans (*ceteris paribus*). Put differently, the expected negative effect of a rate hike on loans is (partly) offset by the positive equity effect on bank loans when bank reserves are remunerated. The transmission mechanism is made less effective, i.e. increases in the policy rate have a smaller effect on the loan supply and ultimately on inflation.²

In *De Grauwe and Ji* (2024b), this equity effect was tested empirically using econometric techniques and it was confirmed that this effect is significant. These results are in line with the recent findings of *Fricke et al.* (2023), who employ a methodology with very detailed bank-level data for the Eurozone. They conclude from their empirical analysis of these micro-data that "banks with larger excess reserves display a relative increase in their credit supply to non-financial companies following the rate hike", thereby confirming that the remuneration of bank reserves tends to weaken the transmission mechanism of monetary policies aimed at reducing inflation.

4. A two-tier system of minimum reserve requirements

The major central banks are now embracing their new operating procedure (arising from the abundant reserve regime), which consists of raising the rate of remuneration on bank reserves as an instrument to increase market interest rates in their fight against inflation. Despite the problems discussed in *Section 3*, there is still a surprising and widespread conviction among central bankers and economists that this is the only reasonable operating procedure.

² The equity channel can also reduce the effectiveness of the transmission mechanism when interest rates are cut during a recession, such as in 2007–2008.

Can one design a system that would avoid the need to make substantial transfers to banks, while maintaining the current operating procedure used by central banks, and in doing so (hopefully) gaining their backing? We believe it is possible to design such a system. It is a two-tier system.

4.1. The proposal of two-tier system³

The two-tier system involves imposing non-interest-bearing minimum reserve requirements on *part* of the bank reserves. Bank reserves exceeding the minimum requirement (excess reserves) would then be remunerated as they are today (for similar proposals for a two-tier system, see *Whelan 2021; Buetzer 2022; van Lerven – Caddick 2022; Tucker 2022*); see also *Angeloni (2023)* for a proposal not to remunerate bank reserves).

Imposing minimum reserve requirements leads to a horizontal displacement of the demand curve for bank reserves to the right (see *Figure 2*). The minimum reserve requirement would apply only to part of the total bank reserves. As a result of this partial displacement of the demand curve, we remain in the abundant reserve regime. The central bank then remunerates the excess reserves at the rate r_D (the horizontal green line). As before, this rate of remuneration acts as a floor for the market rate, and the central bank can raise the market rate by increasing the interest rate on (excess) bank reserves.



³ This subsection is based on *De Grauwe and Ji* (2024b).

A combination of sustained sales of government bonds and minimum reserve requirements would probably be the best policy option. Thus, the central bank would raise minimum reserve requirements as in *Figure 2*. It would then gradually start reducing its bond holdings allowing the supply curve to shift to the left. This also would make it possible for the minimum reserve requirements to be relaxed gradually. In such a strategy, both the supply and the demand curves in *Figure 2* would then shift to the left, maintaining a regime of reserve abundance and allowing the central bank to use its monetary policy tools while reducing subsidies to banks.

The advantage of this two-tier system is that the operating procedure so cherished by central bankers can be left unchanged. The central bank continues to use the interest rate on bank reserves as its monetary policy instrument. The banks continue to have the same incentive to hold excess reserves, as these continue to be remunerated as today. However, the transfer of central banks' profits to commercial banks can be reduced significantly. We show this in *Table 3*, where we assume that the central banks would block 50 per cent of the existing bank reserves in the form of non-remunerated minimum reserves. The remuneration would then be on the excess reserves using the same interest rates as shown in *Table 1*. We observe that in our proposed system there would be a significant reduction of interest transfers to banks. In our two-tier system, the banks would continue to profit. They would continue to receive relatively large transfers on what is essentially a risk-free asset. However, this would be much less than today in 2024 and surely less 'exorbitant'.

Table 3							
Interest transfers in March 2024							
	Present system (billions)	Two-tier system (billions)					
ECB	EUR 141	EUR 70					
Fed	USD 187	USD 93					
BoE	GBP 42	GBP 21					

Sources: Own calculations based on data from Bank of England, Board of Governors Federal Reserve and European Central Bank

There is a window of opportunity today as the ECB decided in July 2023 to stop remunerating required reserves (1 per cent). This implies that the ECB could increase required reserves and reduce its losses, without having to change its operating procedures. We performed some calculations that illustrate the range of choices available to the ECB. In *Table 4*, we show the total reserves as of March 2024 (column 1). We then apply different minimum reserve requirements (column 2). Column 3 then shows the size of the minimum required reserves on which no remuneration is paid. This leads to column 4 showing the reduction of transfers to

banks resulting from these different minimum reserve requirements. Finally, the last column presents the level of excess reserves that are remunerated. At the end of 2023, with a minimum (unremunerated) reserve requirement of 1 per cent, the transfers of the Eurozone's central banks to the banks were reduced by EUR 6 billion. Clearly, the ECB could gradually increase minimum reserve requirements and it would achieve a number of things. Profit transfers to banks could be reduced and hence less money base could be created, the ECB could maintain its operating procedure consisting of changing the deposit rate and, as we showed in the previous section, the fight against inflation could be made more effective with a lower interest rate.

Table 4 Total reserves (March 2024), minimum reserves and transfers								
Total reserves (billion EUR)	Minimum reserve (%)	Minimum reserves (billion EUR)	Reduction of transfer (billion EUR)	Excess reserves (billion EUR)				
3,675	1	151	6	3,524				
3,675	5	755	30	2,920				
3,675	10	1,510	60	2,165				
3,675	15	2,265	91	1,410				
			,					

Note: total reserves = deposit facility + current accounts (min. reserves)

4.2. Answers to critics⁴

Our proposal has been subject to criticism by several observers, which we believe reflects popular views in the financial sector and may concern policymakers. Two points of criticism have been raised: (1) this system will lead to large displacements of bank activities; (2) due to the heterogeneity of banking sectors, our proposal will be felt very differently in different countries. In this subsection, we respond to these criticisms.

4.2.1. Minimum reserve requirements and footloose banks

Bofinger (2023) and *McCauley* – *Pinter* (2024) argue that the imposition of unremunerated MRRs would lead to large-scale displacements of banking activities. In particular, Eurozone banks that would face larger unremunerated MRRs would move the deposits held by their customers to countries with no, or lower, MRRs and perform their lending activities from these countries. This would have dramatic effects on the banking sectors in the Eurozone.

⁴ This part is based on *De Grauwe and Ji* (2024a).

First, some empirical perspectives. Our question is whether large-scale displacement is a credible threat. Banks usually offer worse conditions for EUR holdings outside the Eurozone compared to within the Eurozone. As a result, deposits are less likely to move outside the Eurozone. There is a long tradition of the use of MRRs in Europe. Prior to the creation of the Eurozone, several countries such as Germany, France and Italy used MRRs, sometimes exceeding 10 per cent of deposits. No such major displacements of banking activities took place. Today, Switzerland uses a 2.5 per cent MRR (in contrast to the 1 per cent used in the Eurozone) and one is still waiting for large displacement effects.

Second, every regulation leads to attempts to evade it. Is this a reason not to impose the regulation? Take the example of minimum capital ratios. Most economists agree that minimum capital ratios are essential for maintaining a stable banking system. But bankers dislike minimum capital ratios, and therefore they also try to circumvent this regulation. This does not mean that we should abstain from imposing minimum capital ratios. What we should do instead is to design a regulatory system that minimises the evasion. Here is how to do this.

If these displacement effects following the imposition of a two-tier system of reserve requirements were to occur, the ECB could easily counter these by using an asset-based system of reserve requirements (*Schobert – Yu 2014*). This would consist in defining two tiers in the bank reserves held by banks. Thus, if bank A has total bank reserves of 100 and bank B of 200, the ECB could tell these banks that, say, 20 per cent of these bank reserves are unremunerated and 80 per cent would be remunerated. For bank A this would mean that 20 of their 100 of bank reserves would be unremunerated, and for bank B this would be 40. No amount of displacement of deposits to London, or elsewhere, would help these banks to reduce their unremunerated MRRs. Note that in this tiered system banks would not be required to hold a particular amount of bank reserves.

4.2.2. Heterogeneity of the banking sector

It has been noted by some observers (*Deuber – Zobl 2023; Kwapil 2023; S&P Global 2023*) that the use of a two-tier system of reserve requirements in an environment of heterogeneity of the banking sector could create liquidity problems for some banks that have relatively low bank reserves. These would be forced to borrow funds in the interbank market to satisfy the minimum reserves. In this connection, these observers have pointed at Italian banks that could face liquidity difficulties.

We do not think there would be a systemic problem under reasonable MRRs. We show the evidence in *Figure 3*. This presents the minimum required reserves (that today are 1 per cent of outstanding deposits) as a per cent of the total reserves of the banks. We do indeed observe heterogeneity in the distribution of bank reserves

across countries in the Eurozone. If the MRR is raised from 1 per cent to 9 per cent all Eurozone countries should have enough reserves to satisfy the MRR while maintaining some excess reserves.

Take the case of Italy. In 2023, these minimum reserves represented 10 per cent of total bank reserves of Italian banks. If the MRRs of outstanding deposits were raised to, say 5 per cent, this would imply that these minimum reserves would represent 50.2 per cent of the total reserves of Italian banks. The Italian banks would still have 49.8 per cent of their bank reserves as excess reserves. Hence, we can conclude that as long as the MRRs remain below 9 per cent of outstanding deposits Italian banks would have enough reserves to satisfy these minimum requirements. As long as there are excess reserves in the system as a whole, borrowing liquidity by a few banks to satisfy MRRs does not create a systemic issue.





Source: ECB, Disaggregated financial statement of the Eurosystem. We use the reserve level of each national banking system in 2023 August as the total reserve base.

But if it turned out that significant numbers of banks (in Italy or elsewhere) were to experience serious liquidity problems to satisfy MRRs, the ECB could define these MRRs on an asset base as defined in the previous section. In such a tiered asset-based system, banks would be told to keep a given per cent of their total bank reserves in the form of unremunerated minimum reserves. All banks would be able to satisfy such a requirement without encountering liquidity problems. A tiered asset-based system would solve both the foot-loose and the heterogeneity problems.

5. Rethinking the role of minimum reserves⁵

As argued earlier, minimum reserve requirements were a standard tool of monetary policy in the past in many industrialised countries. This monetary policy tool is still being used in many emerging countries. Its use as an active tool of monetary policy has been discontinued, however, in most industrialised countries.

5.1. A tradeoff between liquidity and profitability

One would have expected that after the banking crisis of 2008 monetary authorities would have taken recourse to minimum reserve requirements as an instrument to stabilise the banking system. They did not. Instead under Basle III they introduced a new instrument of liquidity control. Banks of a certain size were subjected to a 'Liquidity Coverage Ratio' (LCR) (see *BIS 2013*). The Basel III agreement defines the assets that qualify as liquid assets to be included in the LCR and calls them 'High Quality Liquid Assets' (HQLA). The problem is that there are just too many HQLAs eligible for liquidity purposes. Not only do bank reserves at the central bank qualify,⁶ but also government bonds and even certain types of corporate bonds.

It is difficult to understand how regulators designed such a system of liquidity management. Common sense dictated that they would reactivate the only sound instrument of liquidity control, i.e. reserve requirements at the central bank. They did not do so. This seems to be an example of capturing the regulators by banks that want to have their cake and eat it, i.e. they want to have liquidity and make profits. In fact, there is a tradeoff between liquidity and profitability. Assets that are very liquid are not profitable; assets that generate profits are not very liquid.

By remunerating bank reserves the central banks have made it possible for banks to have their cake and eat it: banks can hold highly liquid assets and make a lot of profit. Central banks have eliminated the tradeoff between liquidity and profitability for the banks. In the Eurozone (October 2023), banks could earn more on their bank reserves (4 per cent) than on 10-year German government bonds (2.75 per

⁵ This section is based on *De Grauwe and Ji* (2024b)

⁶ There is some discussion about whether required reserves qualify for inclusion in the LCR. The BIS qualifies central bank reserves (including required reserves) as belonging to the level 1 assets in the stock of HQLAs "to the extent that the central bank policies allow them to be drawn down in times of stress", *BIS (2013)*. The experience of the post-financial crisis shows that central banks typically allow these reserves to be drawn down. Required reserves should be included in the LCR calculations.

cent). This is an extraordinary act of generosity towards bankers, at the expense of taxpayers.

5.2. Tradeoff between efficiency and stability

The decline in the use of minimum reserve requirements by central bankers was very much the result of a paradigm shift from the 1980s on; a shift that stressed the use of market forces and that frowned on policy-induced distortions. Minimum reserve requirements were seen as introducing important inefficiencies in the financial markets that had negative effects on the optimal allocation of capital. It was often seen as a form of financial repression that led to wasteful investment with a negative effect on economic growth (see *McKinnon (1970)* for an early and influential analysis of this view). The corollary of this view was that in truly free markets (provided the monetary authorities maintained price stability) the risk of financial crises would be minimal.

The size of the cost of the inefficiencies induced by minimum reserve requirements is an empirical matter.⁷ The jury is still out on this.⁸ But clearly there is a tradeoff between efficiency and stability of financial markets. The existence of such a tradeoff has now been firmly established both theoretically and empirically. On the one hand, there is a large literature documenting how financial liberalisation spurs efficiency and growth (see *Levine 1997; Beck – Levine 2004; Bekaert et al. 2005* for both theory and empirical validation). On the other hand, there is an equally large literature showing that financial liberalisations tend to lead to excessive risk-taking activities in financial markets increasing the risk of crises (*Stiglitz 2000*). As a result, most banking crises in the postwar period have occurred after financial liberalisations (see *Demirgüç-Kunt – Detragiache 1998; Kroszner et al. 2007* and *Arregui et al. 2013*). The fact that financial liberalisation leads to more efficiency and more instability leads to the conclusion that financial liberalisation leads to a tradeoff between efficiency and stability.

By abandoning the use of minimum reserve requirements, central banks also abandoned the use of an instrument of monetary policy whose primary aim is stabilisation of the banking sector and, more generally, the business cycle. Thus, one can also conclude that in the choice between efficiency and stability, central banks chose efficiency, to the detriment of stability.

⁷ We also have to evaluate whether the cost of these distortions of minimum reserve requirements is offset by gains. These gains are that the authorities can eliminate another distortion which is the subsidy that is granted to the banks today.

⁸ See, for example, *Cuaresma et al.* (2019) who find medium levels of reserve requirements may be optimal for medium- to long-run growth.

In an important paper, *Kashyap and Stein (2012)* show that the use of minimum reserve requirements together with the interest rate makes it possible for the central bank to pursue the two objectives of price stability and financial stability. The interest rate can be geared towards achieving the goal of price stability, while the minimum reserve requirement can be used to achieve financial stability. When banks engage in maturity transformation (borrowing short and lending long) they take risks on their own balance sheets. There is also an externality involved in that bankruptcies of individual banks can lead to bank runs and systemic risks. Individual banks typically do not take these externalities into account. By using reserve requirements, the central bank can force the banks to internalise these externalities.

This also leads to the view that there may not really be a tradeoff between efficiency and stability. If we enlarge the concept of efficiency to include risk externalities, dealing with these externalities and thereby reducing instability can also be interpreted as policies that increase the efficiency of the financial system.

6. Conclusion

Government bond purchase programmes in the framework of QE have led to a fundamental change in the operating procedure of the major central banks, which now operate in a regime of abundance of bank reserves. This requires raising the money market interest rate by increasing the rate of remuneration of bank reserves. This, in turn, leads to a large transfer of central banks' profits (and more) to commercial banks. We argue that this is unsustainable, not only because of the sheer size of these transfers, but also because central banks' profits belong to the governments that have granted the monopoly power to create money base, and the accompanying profits, to central banks. We also argue that there is no serious economic argument to justify why banks should receive an interest rate that now varies between 3.5 per cent (Eurozone) and 5.4 per cent (US) on liquid deposits that carry no risk.

We showed that the present system of remunerated bank reserves strengthens banks' equity position, thereby giving them incentives to increase the supply of bank loans. This has the effect of reducing the effectiveness of the transmission of monetary policies which today is focused on reducing inflation.

We argue that the remuneration of bank reserves is not inevitable and that there is an alternative to central banks' current operating procedure. This alternative reduces profit transfers to private agents and makes monetary policies more effective in fighting inflation. We propose using a system of two-tier minimum reserve requirements. This consists of freezing part of the existing bank reserves in non-interest-bearing deposits, while remunerating reserves in excess of these minimum requirements. This achieves two things. It allows for a drastic reduction in the transfer of central banks' profits to private agents, and it makes it possible for the central banks to maintain their current operating procedure.

We find that there are arguments of fairness to reject the present operating procedure that transfers the profits of central banks (and more) to commercial banks. There is also an argument based on the effectiveness of monetary policies. We argued that the present operating procedures reduce the effectiveness of monetary policy in combatting inflation and that the use of minimum (unremunerated) reserves enhances this effectiveness.

The current problems faced by major central banks are also being experienced by other central banks across Europe. We believe that a two-tier minimum reserve requirement system provides an alternative to address the many challenges discussed in this paper. For policymakers interested in our proposal, it is crucial to carefully evaluate the current regime of abundance of bank reserves, which includes not only political economy issues but also the transmission mechanisms of monetary policy. More empirical evidence is needed to understand how interest rate increases may have varying effects in different markets in an environment of abundant reserves. Additionally, we believe there are valuable lessons to be learned from the 1970s and 1980s. More empirical studies should be drawn from that period, focusing on minimum reserve requirements policy and its impact on central banks, liquidity levels, bank profits and losses and the stability of the financial sector.

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