

Fighting Inflation More Effectively without Transferring Central Banks' Profits to Banks

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Introduction

- To fight inflation, central banks started raising interest rates since early 2022
- Their operating procedure: raising interest rate by increasing rate of remuneration on bank reserves
- Bank reserves are now massive due to past QE
- Massive transfers of central banks' profits to commercial banks

<i>Bank reserves and interest payments to banks (Aug 2023), billions</i>				
	<i>Bank reserves</i>	<i>Interest rate</i>	<i>Interest payments</i>	<i>percent GDP</i>
<i>ECB</i>	€ 3.650	4,00%	€ 146	1.10%
<i>Fed</i>	\$3.136	5,15%	\$162	0.64%
<i>BoE</i>	£909	4,25%	£39	1.75%

Sources: Bank of England, Board of Governors Federal Reserve and European Central Bank

- To give some perspective:
 - these interest payments exceed annual seigniorage gains (profits) of modern central banks.
 - For the US, annual seigniorage gains are typically less than 0.5% of GDP.
 - Total yearly spending of EU is 165 billion; banks obtain almost as much without any condition.
- As a result of their anti-inflationary policies, central banks transfer more than the total seigniorage gains to private banks, and now make significant losses.
- An extraordinary outcome of the fight against inflation.
- This was not the case during 1970s and 1980s when central banks fought inflation: they did not remunerate bank reserves.

Table 2. Remuneration of bank reserves in the Eurosystem (Aug 2023)

Country	Remuneration (million Euro)	% of GDP
Luxembourg	7095	9.15
Cyprus	920	3.31
Finland	5285	1.97
Belgium	10326	1.88
Netherlands	13918	1.45
Malta	241	1.40
France	35925	1.36
Germany	49107	1.27
Austria	4108	0.92
Croatia	593	0.87
Estonia	302	0.84
Slovenia	426	0.75
Spain	9170	0.68
Ireland	3277	0.65
Portugal	1434	0.59
Greece	1201	0.58
Latvia	215	0.55
Lithuania	360	0.53
Slovakia	484	0.44
Italy	8347	0.43

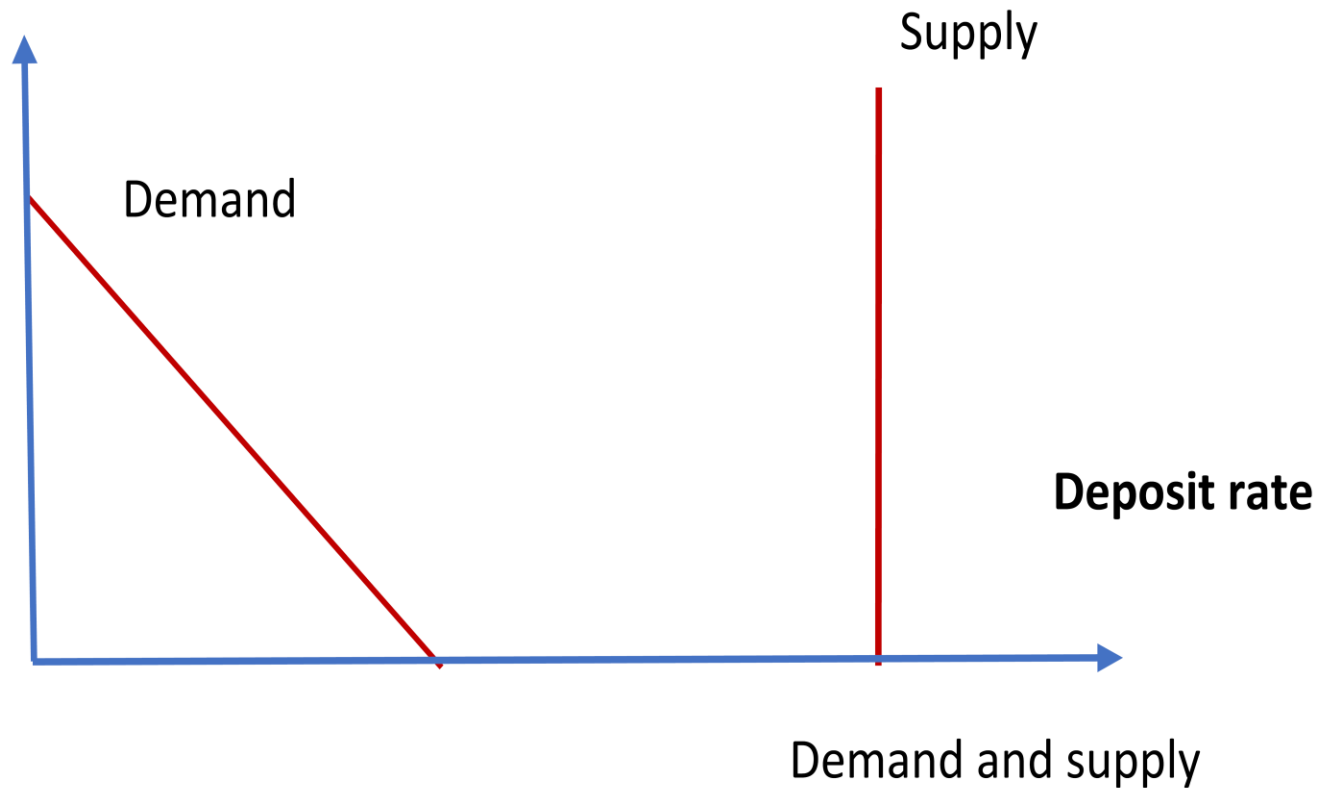
Source: European Central Bank

- Issues that we want to analyze
 - Is the transmission of monetary policy in the current remuneration regime effective?
 - Problems with remuneration of bank reserves
 - Can one design an alternative operating procedure that does not transfer large amounts of money to banks?
 - Rethinking of minimum reserve requirements in the Eurozone

Is remuneration of bank reserves necessary to conduct monetary policy?

Figure 1: Demand and supply of reserves in reserve abundance regime

interest rate

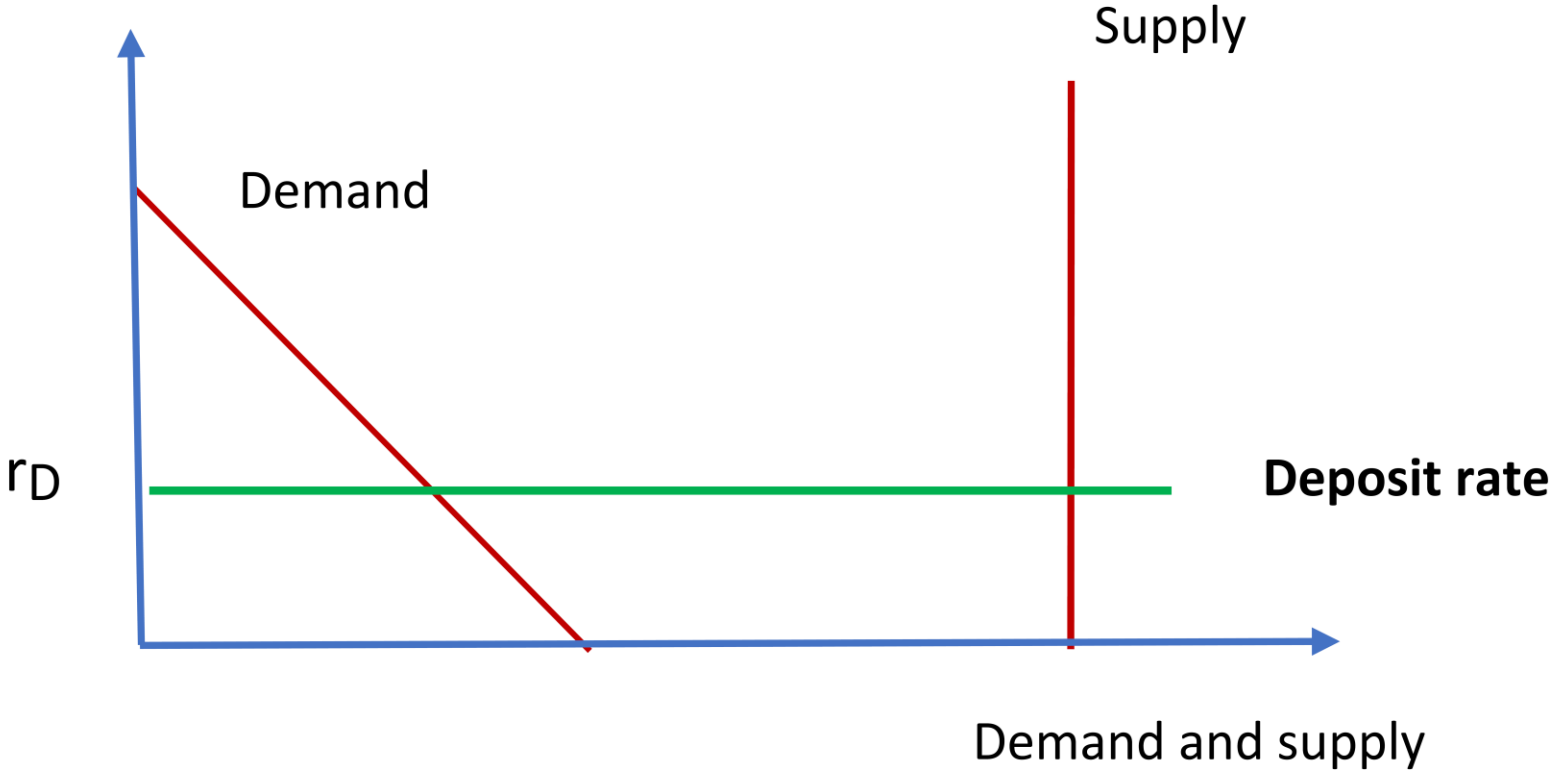


Excess supply in market
for bank reserves
Interest rate is stuck at
ZLB

Is remuneration of bank reserves necessary to conduct monetary policy?

Figure 1: Demand and supply of reserves in reserve abundance regime

interest rate



Yes, by remunerating bank reserves, the lower bound is raised

Note: this is a stylised representation of the market for bank reserves. It does not show the marginal lending rate which acts as a ceiling and is raised together with the deposit rate.

Transmission of monetary policy in the current remuneration regime: is it effective?

- First the theory: **Equity channel of bank lending**
- When the bank's capital (equity) declines banks will have an incentive to reduce lending.
- There are essentially two reasons for this.
 - balance sheet effect: A lower equity means that the bank may not satisfy the minimum capital requirements imposed by regulators. The bank will then have to reduce the supply of loans.
 - with lower equity, the cost of funding bank loans tends to increase, thereby leading to fewer incentives for banks to lend.
- Thus, a decline in the value of banks' equity leads to less bank lending.
- Conversely, an increase in the value of equity stimulates banks to lend more.

Transmission of monetary policy in the current remuneration regime: is it effective?

- The use of remunerating bank reserves is likely to weaken the transmission process of interest rate increases due to equity effect
 - Massive transfers of subsidies by central banks improves banks' equity position thereby leading to this **equity effect**
 - Thus, the effect of interest rate increase on real economy is weakened
 - Transmission of monetary policy of ECB is less effective
 - We tested this hypothesis empirically

- We test this hypothesis by estimating the following fixed effects model, using monthly country-level data of the 20 Eurozone countries from September 2022 to August 2023:

$$y_{it} = \alpha + b1 * Reserve_{it-1} + b2 * r_t + b3 * \Delta Rm_{it} + b4 * Con_{it} + \alpha_i + \varepsilon_{it}$$

- y_{it} : percentage change in the aggregate credit institutions' loans to households and non-financial corporations in country i in month t .
- $Reserve_{it-1}$: aggregate level of reserves in country i in previous month as a percent of GDP of country i .
- r_t : policy rate in month t .
- ΔRm_{it} : (annualized) change in the remuneration of bank reserves in month t as a percent of GDP of country i .
- $Con_{it}, \alpha_i, \varepsilon_{it}$: control variables, countries' fixed effects and error term, respectively.

$$y_{it} = \alpha + b1 * Reserve_{it-1} + b2 * r_t + b3 * \Delta Rm_{it} + b4 * Con_{it} + \alpha_i + \varepsilon_{it}$$

- We use ΔRm_{it} , to measure the equity effect,
 - i.e., how changes in the policy rate changes the net worth of the banks in country i in month t relative to month $t-1$.
 - An increase in the policy rate raises the cashflow from the central bank to the banks and in doing so increases the net worth of the banks, ceteris paribus.
 - We expect a positive sign of this variable, i.e., as the cashflow to banks increases as a result of an increase in the policy rate, banks have an incentive to increase the supply of loans.
 - In doing so, the transmission of an increase in the policy rate is made less effective in reducing inflation by lowering growth of aggregate loans.

**The transmission of monetary policies:
Loans to non-financial corporations (growth rate, in yearly percent changes)**

	(1)	(2)	(3)	(4)	(5)
	All sample	Top 50%	Top 50% exclude	Top 50% exclude	Bottom 50%
Lag reserve	7.05***	12.42***	16.29***	13.92***	-7.23
	[2.43]	[1.58]	[4.28]	[3.57]	[20.24]
Policy rate	-3.00***	-1.46**	-1.64**	-1.42***	-3.75***
	[0.54]	[0.54]	[0.59]	[0.18]	[0.65]
Ln (oil price)	-8.11***	-1.59	-3.57*	1.13	-10.26**
	[2.03]	[2.13]	[1.80]	[1.71]	[3.42]
Change in remuneration	2.13***	1.98***	2.71***	1.16**	7.84
	[0.24]	[0.09]	[0.37]	[0.51]	[4.66]
Business confidence				1.32***	0.35
				[0.41]	[0.59]
Constant term	Yes	Yes	Yes	Yes	Yes
Fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	216	106	84	72	97
R ²	0.627	0.711	0.583	0.882	0.746

Clustered at the country level, the results display robust standard errors in brackets. * p < 0.1, ** p < 0.05, *** p < 0.01. Note: we use adjusted loans to non-financial corporations which measures lending to the real economy (non-financial corporations). "Exclude" means that Cyprus and Luxembourg are excluded from the sample

**The transmission of monetary policies:
Loans to households (growth rate, in yearly percent changes)**

	(1)	(2)	(3)	(4)	(5)
	All sample	Top 50%	Top 50% exclude	Top 50% exclude	Bottom 50%
Lag reserve	6.11***	7.45***	2.92	1.79	-0.82
	[1.51]	[0.81]	[2.32]	[1.97]	[4.66]
Policy rate	-1.05***	-0.98***	-1.10***	-1.30***	-1.90***
	[0.21]	[0.22]	[0.22]	[0.39]	[0.12]
Ln (oil price)	-2.44***	-3.04***	-3.19***	-3.67***	-3.02**
	[0.84]	[0.76]	[0.68]	[0.44]	[1.06]
Change in remuneration	1.08***	1.00***	1.38***	1.44***	2.76**
	[0.24]	[0.22]	[0.24]	[0.31]	[0.88]
Consumer confidence				0.04	0.29**
				[0.32]	[0.11]
Constant term	Yes	Yes	Yes	Yes	Yes
Fixed effect	Yes	Yes	Yes	Yes	Yes
Observations	216	106	84	72	97
R ²	0.658	0.778	0.749	0.828	0.866

Interpretation

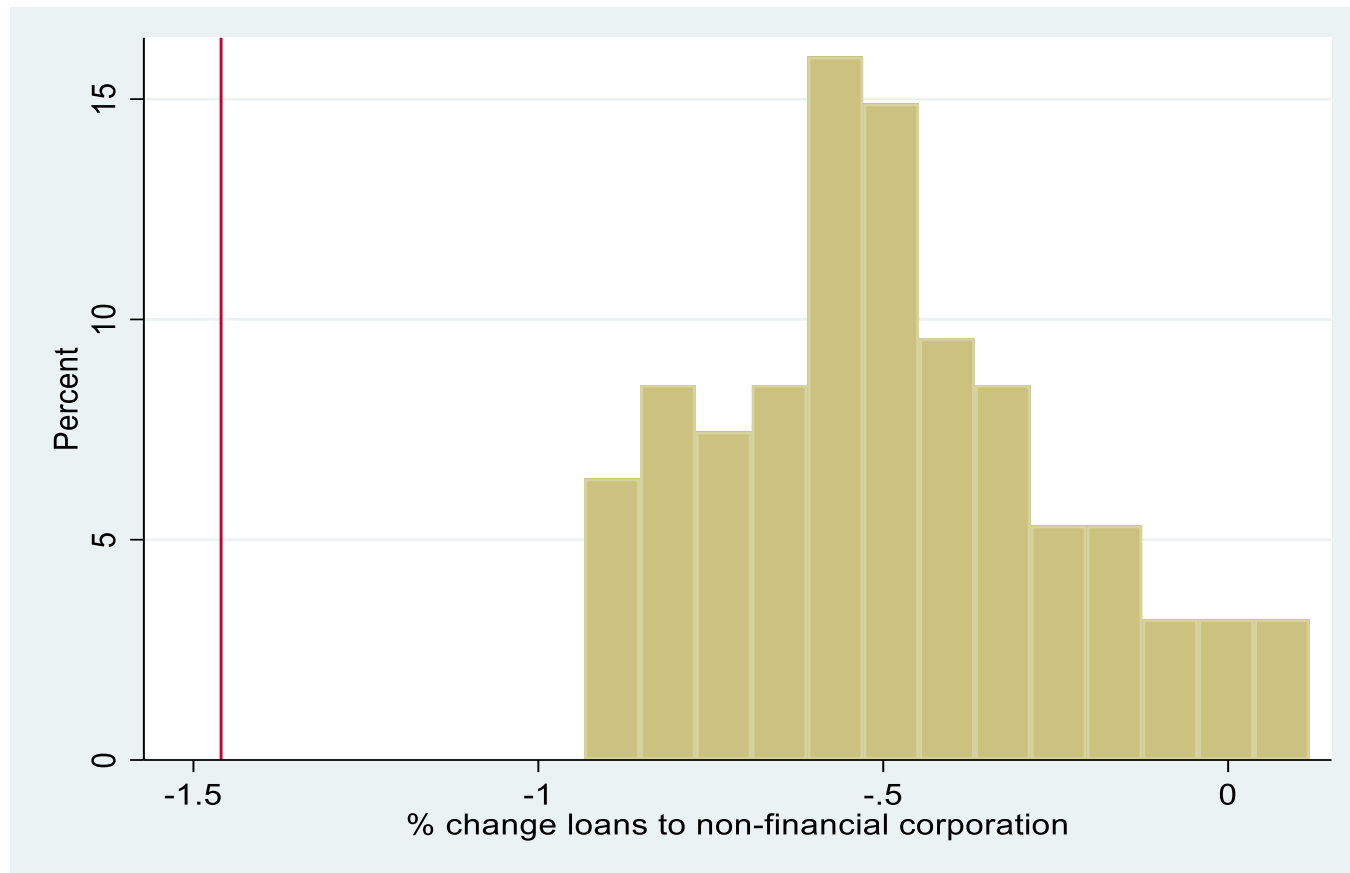
- We observe that an increase in the policy rate of one percentage point is associated with a decline in loans to non-financial corporations and households.
- However, this association is counteracted by the fact that the same increase in the policy rate increases transfers to banks
- leading these to partially offset the negative association of the policy rate hike on bank loans.
- Thus, transmission of a rate hike on loan rate is considerably reduced
- Monetary policy effectiveness is reduced when bank reserves are remunerated.

Interpretation

- We find that the equity effect measured by “change in remuneration” is significant in all cases, except in the case of the bottom-50% for the bank loans to non-financial corporations.
 - Thus, equity effect is important for the countries with high levels of bank reserves. They are mostly countries from the Northern Eurozone.
 - This is less the case in the subsample of countries with relatively low levels of reserves (except in case of loans to households (not shown here)).
- This is in a way not surprising:
 - In countries with low levels of reserves, the equity effect on loans is weak as bank reserves (and their remuneration changes) have a weak impact on the net worth of the banks.
 - In the subsample of countries with high levels of reserves, the link between these reserves and the banks’ net worth is strong.

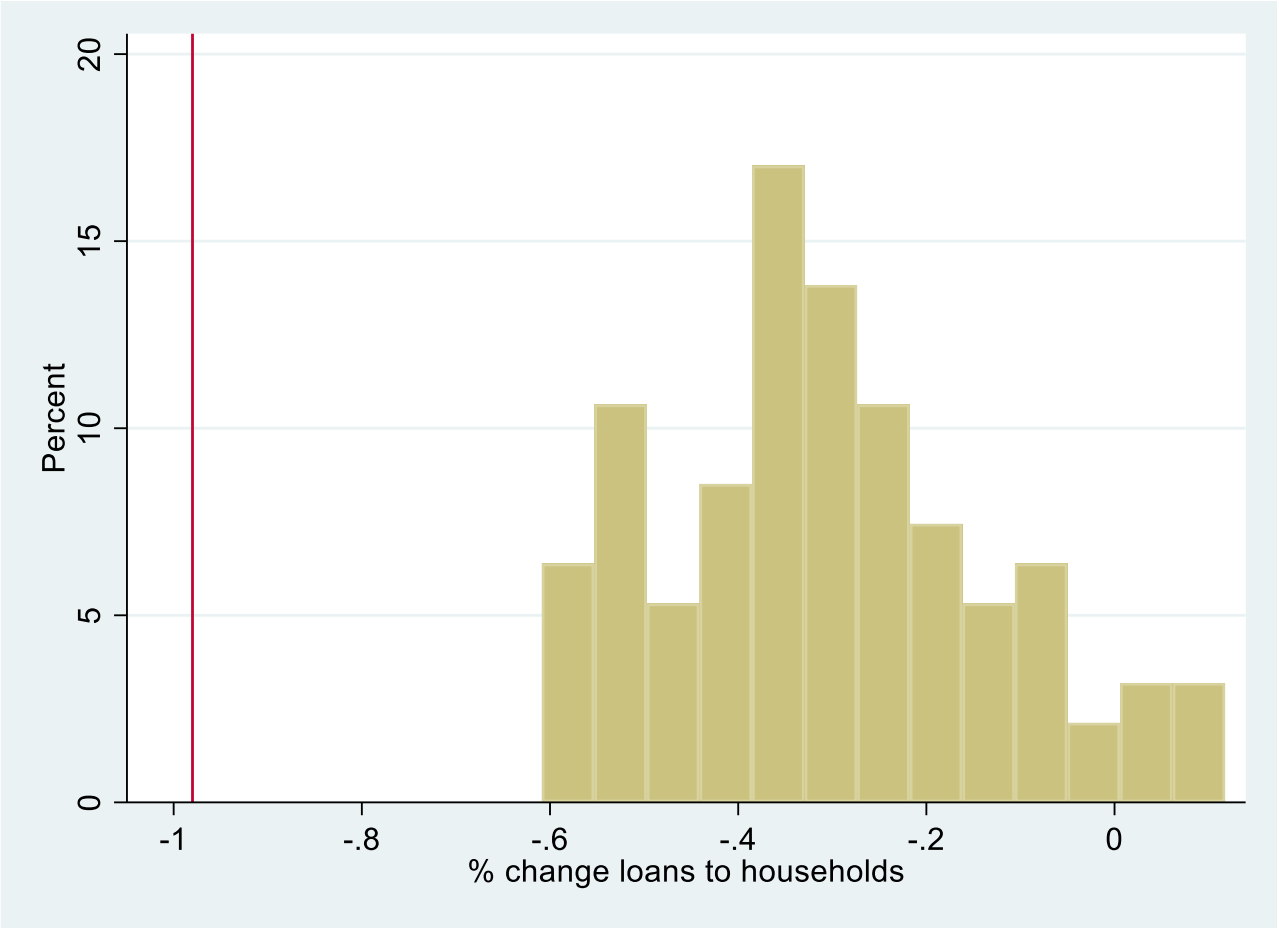
Quantitative effects depend on size of bank reserves

Total effect of a one percent rate hike on % change loans to non-financial corporations (Top 50% sample)



- Total effect is sum of direct effect and equity effect
- Since equity effect depends on size of bankreserves, the total also depends on size bank reserves

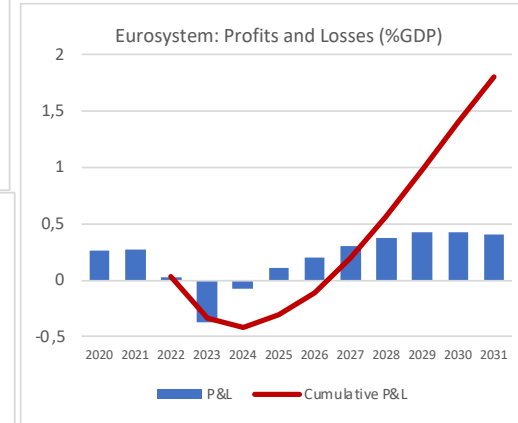
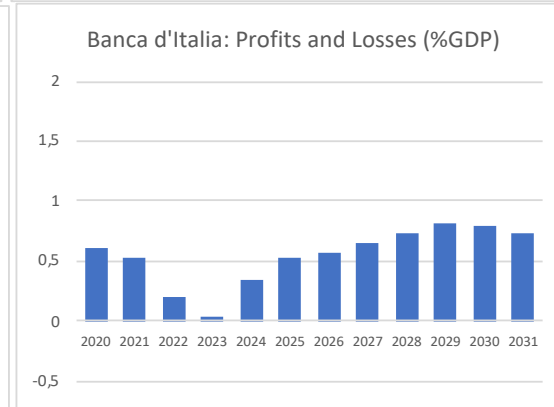
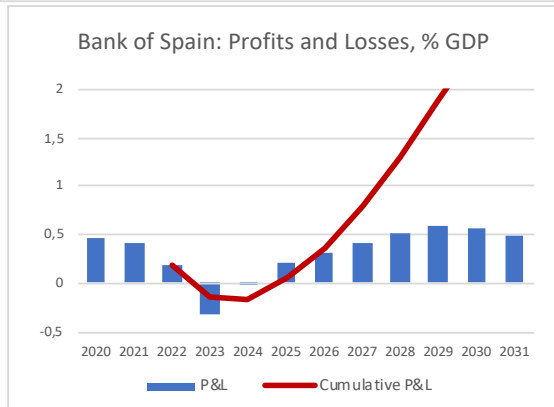
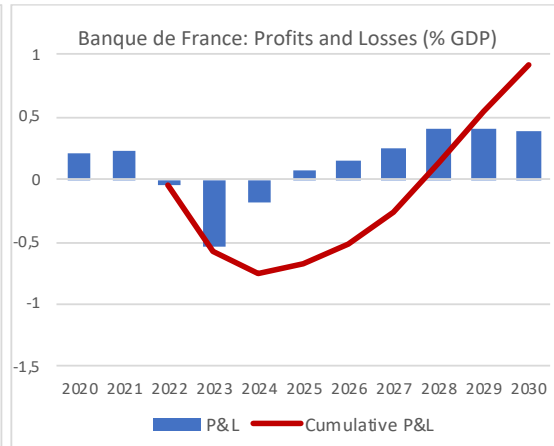
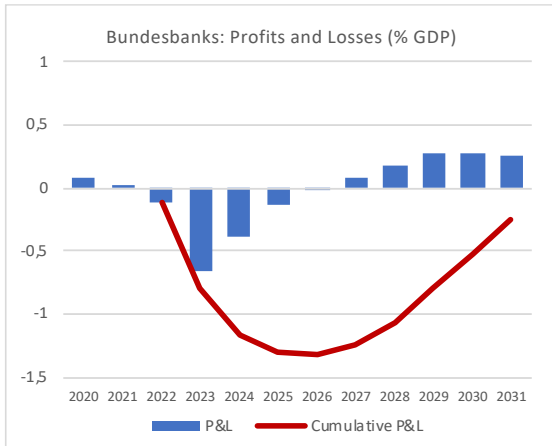
**Total effects of a one percent rate hike on the % change loans to households
(Top 50% sample)**



Political economy problem 1 with these transfers

- Seigniorage gains of central banks find origin in monopoly power granted by governments to central bankers to create money base.
- One would expect that these monopoly profits would then be returned to the government.
- Instead, they are returned more than fully to private agents,
- And lead to large losses of central banks

large losses of central banks



Source: Belhocine, et al. (2023), IMF

Underlying assumptions:

- DR will peak in 2024 and then decline to 2.3%
- Yields on QE-portfolios will increase until 2024-25 and then gradually decline to 2%
- APP is brought down gradually
- PEPP is maintained at same level

Observations

- The Bundesbank makes the largest losses.
 - It will take until 2027 for the Bank to make profits again.
- The Banque de France is the second in the row of central banks with losses.
 - Profit making is estimated to start again in 2025.
- Surprisingly, the Banca d'Italia does not make losses (although its profits decline during 2022-23).
- The Bank of Spain makes some small losses during 2023-24.

The cause of this divergence

- 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) that 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 weaker in the case of the Banca d'Italia and the Bank of Spain.

Political economy problem 2 with these transfers

- The paying of interest on banks' reserve accounts transforms long-term government debt into a short-term debt.
- Most government bonds held by the central banks were issued at very low interest rates
- This implies that governments are immune for some time from the interest rate rises.
- By paying an interest rate of 3.75% (Eurozone) to 4.9% (US) on bank reserves 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.

Central banks have solved the biggest risk of banks

- The profit and loss profile of the central banks mimicks the profit and loss profile of commercial banks during periods of interest increases.
 - the latter “borrow short and lend long”, banks tend to make losses during periods of interest rate increases.
- Banks are escaping this burdensome loss profile as they are making large profits during the current spell of interest rate increases.
- This appears to be possible because central banks have taken over this burden from the commercial banks.
- During the 1970s and 1980s when central banks raised the interest rates to fight inflation they did not make losses (Humann, et al. (2023)).
- Actually, they increased their profits.
- One of the main reasons was that they did not remunerate bank reserves.

Problem 3 with these transfers

- When interest rates increase banks tend to make losses
- Because they “borrow short and lend long”
- Central banks now provide free interest hedging for banks
- Reducing their need to buy costly interest hedging
- Creating potential **moral hazard** issues
- There is no reason why central banks should provide such a free service to private agents

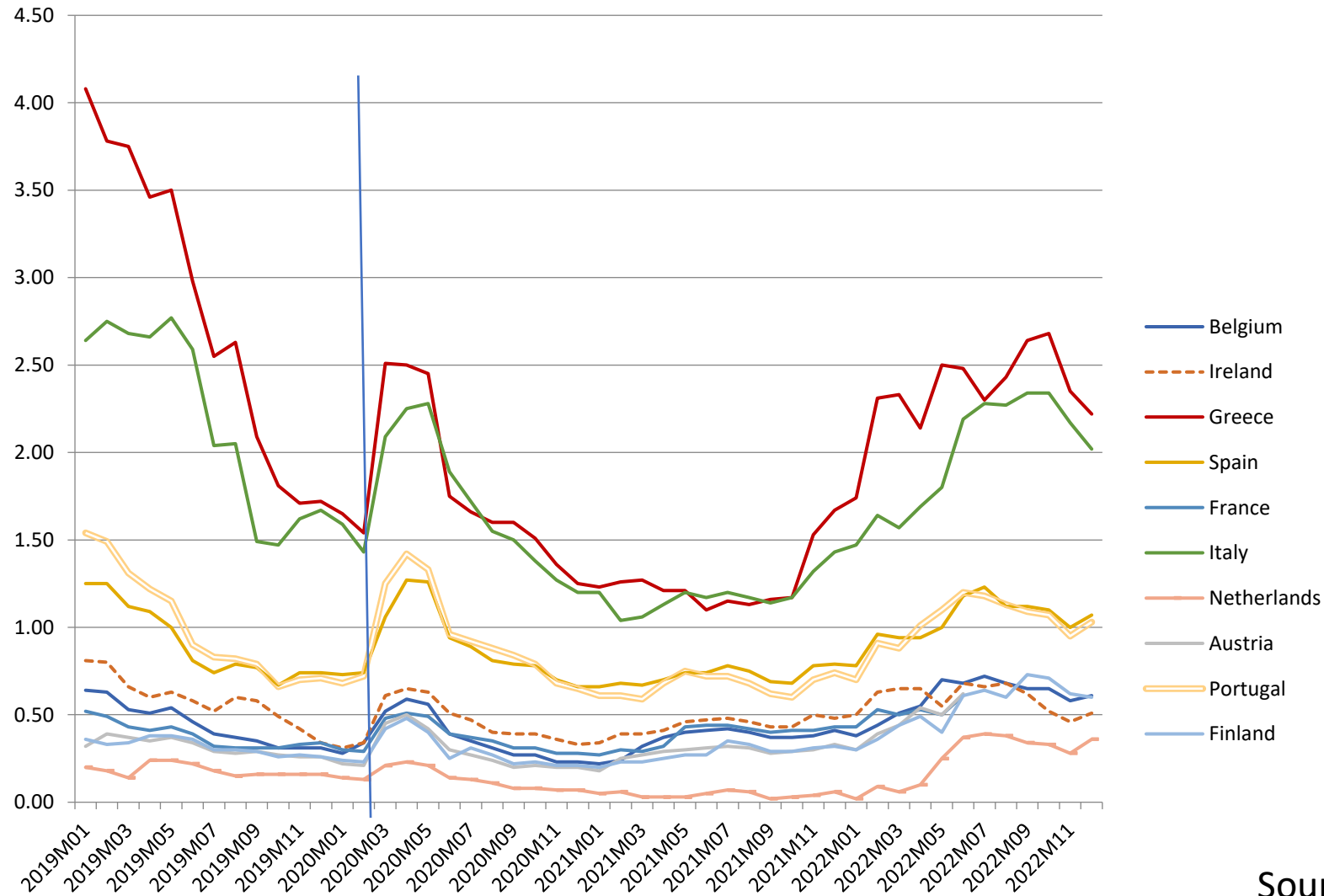
Alternative operating procedures: a return to scarce reserve regime

- Central banks can sell the government bonds again (QT)
- A return to scarce reserve regime will take a long time
- Central banks like Fed and BoE have announced they want to remain in reserve abundance regime for the indefinite future
- That is, they will not sell all the government bonds so as to maintain excess supply in market of bank reserves
- Transfers of profits to commercial banks will continue for quite some time
- There must better way to conduct monetary policies

Special problem in eurozone

- Quick sale of government bonds not only leads to increase in yields that can destabilize bond markets
- In the Eurozone it can also lead to increase in spreads,
- e.g. the yields on Italian government bonds are likely to increase more than yields on German government bonds.
- This happened during pandemic
- And let ECB to launch TIP

Spreads 10-year government bonds in eurozone after pandemic

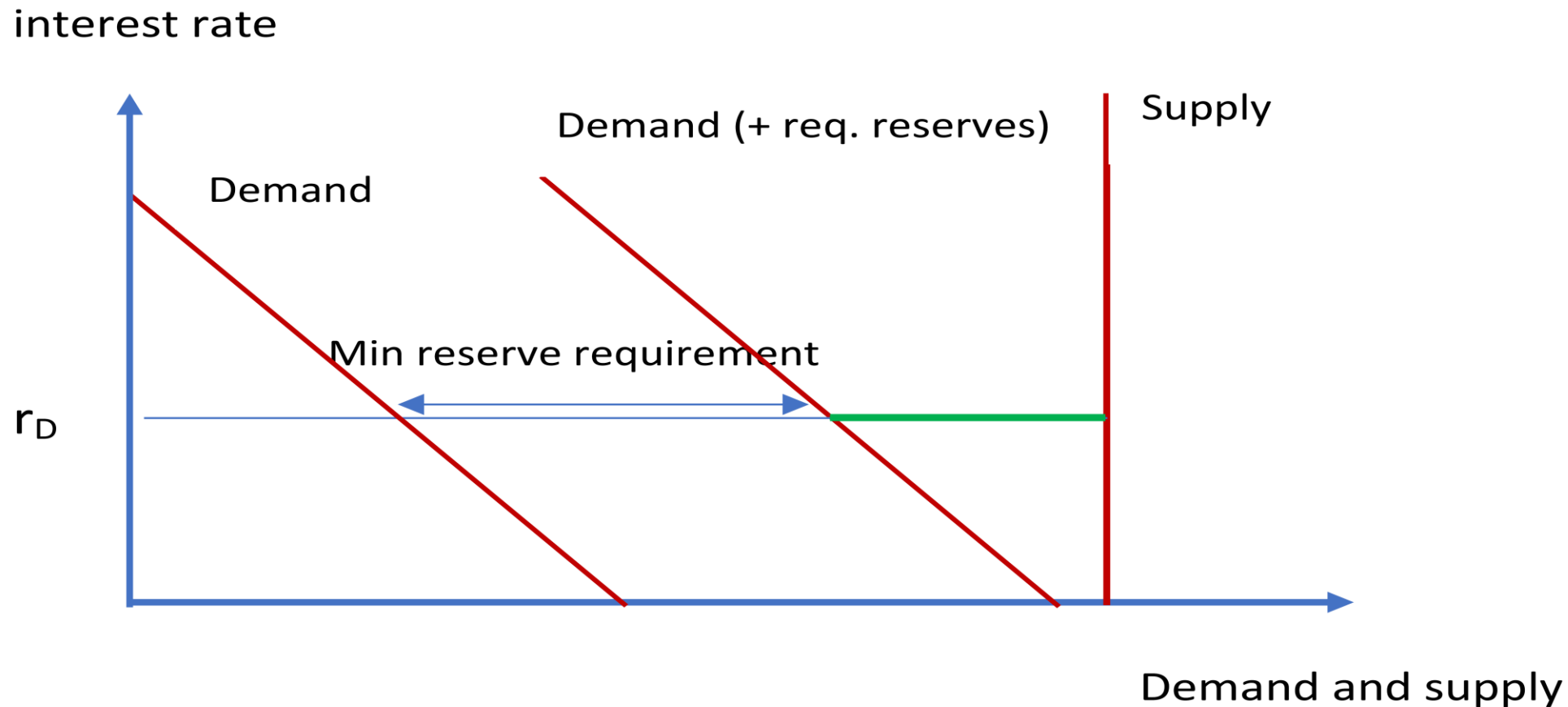


Source: Eurostat

Alternative operating procedures: a two-tier system

- Required minimum reserves are not remunerated
- Excess reserves are remunerated
- Demand curve shifts to the right

Figure 6. Demand and supply of reserves: two-tier system



Advantages of two-tier system

total reserves	percent min res	min reserves	reduction transfer	excess reserves
€ 3.818	1%	€ 168	€ 7	€ 3.650
€ 3.818	5%	€ 840	€ 34	€ 2.978
€ 3.818	10%	€ 1.680	€ 67	€ 2.138
€ 3.818	15%	€ 2.520	€ 101	€ 1.298

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

- ECB could reduce transfers profits to banks applying reasonable minimum reserve requirements
- Reasonable: min reserve requirements that have been used in the past
- Thereby reducing transfers significantly
- Maintaining operating procedure
- and making banking system more stable

Problems of MRR in Eurozone: heterogeneity

- The distribution on bank reserves is uneven in Eurozone
- And so is the share of minimum reserves in total reserves

Minimum reserves as percent of total reserves

Austria	5,6%
Belgium	3,3%
Cyprus	2,9%
Germany	5,6%
Estonia	6,6%
Spain	7,5%
Finland	3,4%
France	4,7%
Greece	5,7%
Ireland	5,5%
Italy	9,2%
Lithuania	8,8%
Luxembourg	6,1%
Latvia	6,6%
Malta	14,9%
Netherlands	5,0%
Portugal	7,4%
Slovenia	5,3%
Slovakia	4,8%

Heterogeneity of distribution of reserves

Example Italy:

- Has a high proportion of minimum reserves in total reserves
- A minimum reserve ratio of more than 10% would lead Italian banks into scarcity of excess reserves to satisfy MRR
- They would have to borrow reserves in interbank market
- Thus, MRR should not exceed 10%

Rethinking the role of minimum reserves

- Since the 1980s minimum reserve requirements are increasingly seen as introducing important inefficiencies in the financial markets
- that have negative effects on the optimal allocation of capital
- This coincided with paradigm shift:
 - a shift that stressed the use of market forces
 - and that frowned upon policy induced distortions.
 - In this view: if minimum reserve requirements are used, they should be remunerated (Friedman(1960))
 - Remuneration minimizes distortions
- Central banks abandoned minimum reserve requirements based on efficiency grounds, setting aside stabilization concerns

- literature showing that financial liberalizations tend to lead to excessive risk taking in financial markets increasing the risk of crises (Stiglitz(2000), (see Demirgüç-Kunt and Detragiache (1999), Kroszner et al. (2007) and Arregui et al. (2013)).
- Today, in the reserve abundance regime, the use of minimum reserve requirements can stabilize the banking sector and, and hence the business cycle.
- 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 both price stability and financial stability.
 - One interesting idea: not remunerating the reserve below the threshold does not distort the incentive of banks to hold more reserve as banks are still attracted by the remuneration above the required level

- Common sense dictated that central banks reactivated the only sound instrument of liquidity control, i.e. reserve requirements at the central bank.
- However, they did not do so, because they did not want to damage the “profits” of the banking sector.
- By remunerating bank reserves the central banks eliminated the tradeoff between liquidity and profitability for the banks.
 - assets that are very liquid are not profitable;
 - assets that generate profits are not very liquid.
- In doing so, they created a land of plenty for the banks.
- They made it possible for banks to hold highly liquid risk-free assets and make a lot of profits.
 - In the Eurozone, banks can earn more on their bank reserves (4%) than on 10-year German government bonds (2.5%).
 - An extraordinary act of generosity towards bankers, at the expense of taxpayers

Conclusion

- The large transfers of central banks' profits are without economic foundations
- They also appear extremely unfair
- They reduce the effectiveness of monetary policy to fight inflation
- These transfers can be reduced significantly without affecting the central banks' operating procedures
- By using a two-tier system of reserve requirements
- This will also lead to a significant decline in the losses of the central banks and increase effectiveness of monetary policy.
- There is a window of opportunities to introduce such a system today