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Abstract

This paper examines myopic, populist policies that guarantee short-term financial protection of the people from the elite without regard for long-term fiscal or monetary distortions. Assuming that citizens are financially heterogeneous, this paper shows that inefficient outcomes can arise when the majority of citizens are bank stakeholders. Populist policies promote politically controlled central banks.

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1. Introduction

Some researchers argue that the rise of populism may negatively affect the consensus in favour of central bank independence (CBI) evident from the late 1980s until the 2007-2008 financial crisis (Buiter 2016, de Haan and Eijffinger 2017, Goodhart and Lastra 2017, Rajan 2017, Rodrik 2018). The aim of this paper is to explore the relationships between populism and CBI using a political economy framework that links literature covering the effect of populism on economic policies with literature on the need to reconsider CBI in a systematic and novel way.

After the first wave of populism, which was mostly concentrated in Latin America (Dornbush and Edwards 1991, Acemoglu et al. 2013), a second wave of populism gained ground in many European countries and the United States, leading to both left-wing and right-wing movements. Such movements directly and/or indirectly influence the design and implementation of different kinds of economic policies (Dovis et al. 2016, Aggeborn and Persson 2017, Rodrik 2017).

The populist movements, which share a demand for short-term protection, appear to be characterized by three main properties (Guiso et al. 2017): the claim that they protect the people from the elite, certain demand conditions and a disregard for future consequences. At the core of populist policies is the fact that they present solutions that are welfare enhancing in the short run for a majority of the population but costly in the long run for the overall population. This seems to be a constant in the literature focused on the economic aspects of populism (Sachs 1989, Dornbush and Edwards 1991, Acemoglu et al. 2013, Chersterley and Roberti 2016).

Today, "with their PhDs, exclusive jargon, and secretive meetings in far-flung places like Basel and Jackson Hole, central bankers are the quintessential rootless global elite that populist nationalist love to hate" (Rajan 2017). In other words, the narratives of central bankers seem to sketch them out as a natural target for populist policies. Consequently, a key research question arises: Under which conditions is a populist reform – a reform aimed at guaranteeing short-term protection without regard for longer term consequences – likely to emerge with respect to a vital pillar of central banks' power – their degree of independence.

By the time of the 2007-2008 financial crisis, the independence of central banks had become the benchmark for evaluating the effectiveness of monetary institutions around the world. This institutional design was supported by a broad consensus (Cecchetti 2013, Bayoumi et al. 2014, Goodhart and Lastra 2017, Issing 2018). The theoretical bottom line is well known (Cecchetti 2013, Eijffinger and Masciandaro 2014): incumbent policymakers tend to use monetary tools for short-term purposes and for smoothing out various kinds of macroeconomic shocks, including real (Barro and Gordon, 1983) and fiscal (Sargent and Wallace, 1981) imbalances. However, the more markets are efficient, the greater the risk that the short-sighted monetary policies will produce distortions. Therefore, the rules of the game between policymakers and central bankers came into focus (Barro and Gordon, 1983; Backus and Driffill, 1985; Rogoff, 1985; Lohmann, 1992, Persson and Tabellini 1993), triggering a significant stream of literature on CBI.

The evolution of this research field occurred in two steps. Initially, scholars involved in the field worked on verifying theoretical conjectures through comparative, institutional and empirical analyses. Then, after constructing CBI indices (Grilli et al. 1991, Cukierman et al. 1992; Alesina and Summers, 1993), they used cross-country studies to determine whether and how the different indices could be considered as drivers of the most important macroeconomic phenomena, including inflation (Klomp and De Haan 2010) and fiscal variables (Bodea and Higashijima 2017). In some

cases, researchers evaluated a country at a particular point in time (Acemoglu et al. 2008). However, as CBI is sometimes included as one component of a larger reform package or is viewed as part of a more complex series of events, establishing causality has been challenging (Bayoumi et al. 2014).

The first wave of studies on central bank regimes, including those adopting more critical views (McCallum, 1995), took an important step forward by considering CBI as an endogenous variable that had to be explained (Posen, 1995, Franzese 1999, Hayo and Hefeker 2002, Aghion et al. 2004, Crowe and Meade 2008, Jacome and Vasquez 2008, Fernàndez-Albertos 2015). The aim in this regard was to shed light on the drivers of governments' decisions to maintain or reform their monetary regimes.

The approach of CBI endogeneity is adopted in this paper to explain the second wave of studies devoted to the central bank regime in the last decade. These studies are depicted in Figure 1. CBI has become again a relevant subject in academia, politics and the media. However, in this most recent surge in the topic's popularity, some have noted (Alesina and Stella 2010, Cecchetti 2013, Bayoumi et al. 2014, Issing 2018) that the critical voices seem to dominate (Stiglitz 2013, Ball et. Al 2016, Rodrik 2018).

Figure 1: Articles with "central bank independence" in the title (1991-2015)

Notes: Figure 1 presents the evolution of the number of academic papers published with a title containing the words "central bank independence" between 1991 and 2015. Data obtained from SSRN and JSTOR. Source: Masciandaro and Romelli 2018.

This increased interest mainly reflects the fact that the economic and political importance of the central banks in the advanced economies has grown since the beginning of the 2007-2008 crisis (Buiter 2014). Supervisory and regulatory responsibilities have been piled onto the central banks, thereby intensifying the relationships among banking, fiscal and monetary policies (Bayoumi et al. 2014, de Haan and Eijffinger 2017). The boundaries between the central bank's role as liquidity manager and the government's solvency support for banking and financial institutions have been blurred, inevitably triggering a debate on the shape of central bank settings (Nier 2009, Bean 2011,

Cecchetti et al. 2011, Ingves 2011, Reis 2013), especially with regard to the features of CBI (Cukierman 2008 and 2013, Cecchetti 2013, Taylor 2013, Buiter 2014, Sims 2016, Blinder et al. 2017). These aspects have also been in focus from a historical perspective (Bordo and Siklos 2017). In this vein, an important question is whether the policy-blurring effect has made the pendulum swing in the other direction. Thus far, comparative analyses have not offered homogenous results (Bodea and Hicks 2015, de Haan et al. 2018, Masciandaro and Romelli 2018). Our paper zooms in this policy-blurring effect and sheds light on the impact in terms of CBI.

The remainder of the paper is organised as follows. Section 2 and 3 present the economics and the political economy of the theoretical model, respectively. Section 4 offers a discussion of the results regarding the relationships between populism and CBI. Our conclusions are found in Section 5.

2. The Economy: Citizens, Banking Crises, Policy Options and the Role of CBI

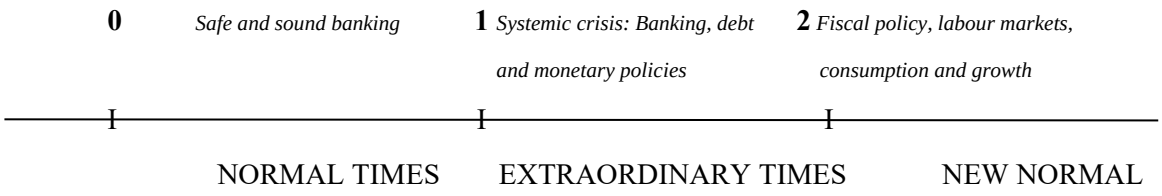
Our model mimics an economy in which a systemic banking shock can occur. The policymakers can design a policy involving banking, fiscal and monetary aspects aimed at minimizing the spillovers of a shock into the real sector. This policy takes the institutional design of the central bank regime into account.

The economy consists of a population of citizens, a government, a central bank and a banking system.[1] For the sake of simplicity, we assume that the population size is normalized to one, such that total and per capita amounts are the same for all variables.

The sequence of events is as follows (see Figure 2). At $t = 0$, banks engage in business with some level of risk (*normal times*). The outcome of these activities determines the extent to which the bank's risk profile (i.e. its capacity to meet its obligations) is safe and sound. Without a bank crisis, the government does not need to issue debt and, consequently, there is no need to introduce distortionary taxation to service such debt. At $t = 1$, bank failures that trigger public externalities can occur and, consequently, the government has to design its strategy (*extraordinary times*). This public policy involves two decisions, one regarding the banking policy (i.e. the bailout amount) and another regarding the fiscal policy (i.e. how to finance such a bailout). The fiscal monetization will depend on the extent to which the central bank is independent. Given that the government issues public debt for the amount of the bailout and that government bonds can be purchased by either citizens or the central bank, the degree of CBI tell us the amount of public debt to which the central bank is forced to subscribe. In general, the level of CBI serves as a proxy for the central bank's power as a veto player given the political pressure to use monetary policy tools to address banking and/or fiscal emergencies.

[1] Alternatively, as in Gertler et al. (2017), we can assume that each household (family) consists of a continuum of members who can be either workers or bankers. Workers supply labour and earn wages for the household, while bankers manage a financially risky business and transfer the relative earnings back to the household. The number of bankers in each household is heterogeneous.

Figure 2: The business cycle: Normal times, extraordinary times and the new normal



At $t = 2$, the government introduces an income tax to repay debt and interest. The citizens make decisions about labour, consumption and income given the tax, and the central bank transfers payments for interest received on its bond purchases back to the government (*"new normal" times*).

The governmental policies that adopt a long-term perspective, including the definition of CBI, will be socially optimal policies. In other words, the equilibrium in the new normal times will reflect the intertemporal trade-off between minimizing tax distortions and smoothing out banking externalities. This leads to the following challenge: if the policies trigger heterogeneous effects on the country's citizens, different individuals will have different views regarding those policies. This is crucial as long as the citizens' preferences are relevant in the political process. Therefore, the final policy is not automatically or mechanically equal to the socially optimal one.

Our model focuses on heterogeneity among citizens in terms of financial inequality given that the mix between banking and monetary policies can produce the "three D" effects (Goodhart and Lastra 2017). The distributional effect results from changes in interest rates. The directional effect captures the impact of public policy on a certain sector and/or constituency of the economy, such as the banking industry (Brunnermeir and Sannikov 2013). The duration effect measures the monetary policy's effect on overall public-sector liabilities, including the central bank's balance sheet within the public sector. In this regard, more fiscal monetization reduces the duration and is likely to be associated with monetary instability. The duration effect can move the spotlight to the fiscal implications of the central bank's balance sheet (Cavallo et al. 2017). The directional effect depends on banking policy choices, while the distributional effect and the duration effect are associated with the corresponding fiscal and monetary policies.

The duration effect is associated with the dimensions and risk profile of the central bank's balance sheet (CBBS). The emerging role of the CBBS in the monetary policy perimeter (Curdia 2011, Bindsell 2016, Reis 2016a and 2016b) highlights how an abnormal CBBS can trigger instability in the longer term for at least two reasons (Rajan 2017), notwithstanding the gains that the provision of a public safe asset can produce (Greenwood et al 2016). First, an excess supply of publicly provided external money may crowd out private internal funds. Notably, privately provisioned liquidity has additional benefits (Diamond and Rajan 2001). Second, large CBBSs can increase the risk of moral-hazard behaviour among politicians (Plosser 2013 and 2017, Sims 2016).

Given that the first ring in the overall chain of events is the likelihood of a banking crisis, we start with banking activities.

2.1 Normal Times: How a Banking Crisis Can Emerge

For the sake of simplicity, we assume that there is only one bank in the economy. In other words, we assume that all banks are homogeneous and that the macro banking outcome is simply the sum of micro-level optimizing behaviour.

The systemic risk that a banking crisis can produce depends on the behaviour of the banking sector. Banking activity is measured using the variable *r*, which parameterizes the amount of risk that the banks bear while doing business. The bank's profits increase as a function of risk as does the bank's overall equity value. Let this value be $\pi(r)$, with $\pi'(r) > 0$ and $\pi''(r) < 0$. Without losing generality, we normalize the number of bank shares to one, such that π also represents the market price of the bank shares. Let $\lambda\pi$ be the total amount of bank liabilities, where λ is the liability to capital ratio, which parameterizes the bank's financial leverage.

In normal times, a banking crisis occurs if the bank is unable to meet its obligations. In such an event, the value of the bank's liabilities, $\pi(1+\lambda)$, falls to zero, and the bank's shareholders bear the full cost, π, of the crisis (bail-in). We assume that the bank's failure probability, *p*, is associated with its risk assumption. Therefore, we assume that the crisis probability, $p(r)$, is increasing and convex in risk, such that $p'(r) > 0$ and $p''(r) > 0$.

When a crisis occurs, a bailout policy can be designed that injects fresh public capital in a proportion β of the bank's value $\pi(1+\lambda)$. Thus, β is the policy variable that parameterizes a bailout, $\beta \in [0,1]$, with $\beta\pi$ representing the bank's equity value after the bailout and $(1-\beta)\pi$ representing the cost for shareholders.

The bank chooses the risk profile that maximizes its own expected equity value, while taking both the crisis event and the bailout into account:

$$Max_r \pi(r)(1-p(r)) + \beta^* \pi(r)\, p(r), \tag{1}$$

where the first term in the maximand is the expected value when business continues as usual (i.e. without turmoil) and the second term represents the outcome if a bailout policy β^* is implemented when a crisis occurs. The optimality condition that pins down the optimal level of risk, *r**, undertaken by the bank is the following:

$$(\pi'(1-p) - p'\pi) + S(\pi' p + p'\pi) + S_\pi \pi' \pi p \le 0, \tag{2}$$

where strict inequality implies $r^* = 0$. The first bracketed term in equation (2) represents the marginal effect of the risk assumption on the equity value. If the bailout option does not exist, only this term will appear in the LHS of equation (2). The second and third terms represent the moral hazard arising from the bailout option. The bank's behaviour in normal times discounts the possibility and the features of government intervention in extraordinary times, which depend on the CBI, all else equal. The possibility of a direction effect in favour of the banking system matters.

2.2 Extraordinary Times: Policy Options in a Banking Crisis

The second ring in our narrative is the government's behaviour. When a bank fails, the government enters an environment of extraordinary times and faces a trade-off: let the bank fail or rescue it by injecting new capital. In the latter case, the government issues public debt for the amount of the bailout. Public bonds can be purchased by either citizens or the central bank. The central

bank's purchases represent fiscal monetization, which is inversely associated with the CBI (fiscal dominance). A higher degree of independence means a lower level of forced fiscal monetization.

The government defines the optimal bailout policy, β^*, recalling that $\beta \in [0,1]$. If a bailout policy, $\beta\pi(1+\lambda)$, is implemented, the government supports both the bank's shareholders and its depositors. It finances this policy by issuing new debt at time 1, which becomes an asset in the portfolios of citizens and the central bank. It then charges a linear income tax, τ, for servicing the debt at time 2. The overall government budget constraint is:

$$\beta(1+\lambda)\pi(1+i(1-\delta)) = \tau y, \tag{3}$$

where τ is the tax rate, *y* is the income of the citizens before the taxes, i is the interest paid on the government bond and δ is the share of the debt purchased by the central bank, where $\delta \in [0,1]$. The debt monetization is negatively associated with the CBI. The level of CBI will influence both the distributional effect (i.e. the consequences for interest rates) and the duration effect (i.e. monetization consequences) of the bailout policy.

The interest rate on public bonds is determined according to a no-arbitrage condition with respect to a perfect, long-term, risk-free interest rate, which we normalize to zero for simplicity. For any unit of debt issued in time 1, the government repays $1+i(1-\delta)$ in time 2. The cost of debt, $i(1-\delta)$, is negatively associated with fiscal monetization, which depends on the CBI. When a central bank is more independent (i.e. low δ), a larger portion of the debt is likely to be sold to citizens. The government fully internalizes the economic consequences of the central bank regime, which shapes the likelihood of distributional and duration effects from the monetary policy stance. Therefore, when defining the institutional rules (i.e. the degree, δ, of CBI), the government can determine its degree of freedom in defining the fiscal monetization of the bailout policy, β, and consequently the tax policy, τ. Therefore, the overall policy design is $\tau = T(\beta, \delta)$.

The government's policy will influence the economy through the behaviour of the citizens, which is the third and final ring in our chain of events.

2.3 New Normal Times: Real Economy Spillovers of the Policy's Implementation

The citizens are risk neutral, and they draw utility from consumption and disutility from labour. They use their net labour income and their financial assets to buy consumption goods. We assume heterogeneity in the composition of their portfolios, while labour income is assumed to be the same for all the individuals. These assumptions enable us to zoom in on the macroeconomic consequences of financial inequality, all else equal.

Starting with labour income, let individual utility from labour be:

$$l(1-\tau) - U(l). \tag{4}$$

Labour productivity is normalized to one. Then $l(1-\tau)$ is the after-tax (net) labour income. $U(l)$ is an increasing and convex effort function. After observing τ, each citizen chooses how much to work in order to maximize (1). The optimality condition yields his or her labour-supply function:

$$L(\tau) = U_l^{-1}(1-\tau). \tag{5}$$

$L(\tau)$ is decreasing in the tax rate: $L_T < 0$. Labour supply is the same for all citizens. Given the above-mentioned productivity and that the population size is one, the labour supply represents the total income: $y = L(\tau)$. Therefore, income and labour supply in equilibrium will depend on the tax policy, which can be influenced by the government's decision regarding the bailout option.

However, the government's decisions also influence the financial assets held in the individual portfolios. In our economy, four asset types are present: bank shares; bank deposits, which can be used as medium of exchange (no outside money is present); government bonds; and other financial assets.

If the banking policy, β, is implemented at time 1, the *average* value of a citizen's portfolio will be influenced. Its shape at time 2 will be the following:

$$\beta\pi + \beta\lambda\pi + \beta(1+\lambda)(1-\delta)\pi(1+i) + \left[w - \beta(1+\lambda)(1-\delta)\pi\right]. \quad (6)$$

The first term is the value of the bank share, and the second term is the value of the bank deposits. The third term is the value of the government bonds inclusive of interest payments, while the fourth term represents the difference between the initial wealth, *w*, and the value of the bonds purchased by citizens. Notably, the bailout option can influence the average portfolio value through two channels: the value of the bank's liabilities (direction effect) and the interest payments on public bonds (distributional effect).

Disposable income and the portfolio assets finance consumption. Citizens draw utility from consumption, *c,* at time 2. The budget constraint of a citizen who owns an average portfolio is then:

$$c = l^*(1 - T(\beta,\delta)) + w + \beta(1+\lambda)\pi(1+i(1-\delta) \equiv C(\beta,\delta), \quad (7)$$

where *l** is the optimal labour supply, which depends on the selected tax policy, such that $l^* \equiv L(\tau)$.

Finally, we have to consider the existence of financial and monetary externalities that a banking crisis can trigger. We assume that the decline in the values of both bank shares and deposits to zero can trigger financial externalities. Let the externality function be:

$$\frac{\varepsilon}{2}\left[(1-\beta)(1+\lambda)\pi\right]^2 \equiv E(\beta). \quad (8)$$

The externalities are increasing and convex in the amount of bank liabilities that evaporate, and they depend on the bailout option, β, that the government can implement. The smaller the bailout policy is, the lower the direction effect and the greater the externalities.

However, the bailout option also triggers monetary policy consequences. We assume that fiscal monetization is associated with increasing monetary stability costs – the fiscal dominance regime is not cost free. For the sake of simplicity, we assume that the costs of monetary instability, $I = I(\beta,\delta)$ (i.e. the duration effect), are quadratic in the degree of CBI δ:

$$\frac{\phi}{2}\delta^2\beta(1+\lambda)\pi \equiv I(\beta,\delta). \quad (9)$$

In summary, citizens draw utility from consumption and disutility from labour. In addition, financial and monetary externalities must be taken into account. If we assume that these costs are

homogenous among citizens – still to be focused on the role of financial portfolio heterogeneity – the indirect utility function $V(\beta,\delta)$ of the average citizen at time 2 is:

$$V(\beta,\delta) = C(\beta,\delta) - U(l^*) - E(\beta) - I(\beta,\delta). \quad (10)$$

As the population size is one, $V(\beta,\delta)$ also represents the social-welfare function.

3. Optimal Level of CBI

The normative benchmark for evaluating actual public policies, which includes the definition of the optimal level of CBI, can be identified as follows. Assume that a social planner takes the relationship between the tax policy, τ, and the labour supply into account, and simultaneously sets the policy strategy regarding the banking policy, β^*, and the monetary policy, δ^*, at time 1 in order to maximize the social-welfare function, $V(\beta,\delta)$.

Given the public budget constraint (3) and the labour supply (5), the budget constraint becomes:

$$\beta(1+\lambda)\pi(1+i(1-\delta)) = \tau L(\tau). \quad (11)$$

This gives, in implicit form, the relationships between the tax policy on the one side and the banking and monetary policies on the other side. In fact, by differentiating (11) and introducing the labour supply elasticity $\eta(\tau) \equiv -\tau L_T / L$ to highlight the tax-distortion effect, we obtain:

$$T_\beta = \frac{(1+\lambda)\pi(1+i(1-\delta)}{l^*(1-\eta(\tau))} > 0 \text{ and} \quad (12)$$

$$T_\delta = \frac{\beta(1+\lambda)\pi i}{l^*(1-\eta(\tau))} < 0, \quad (13)$$

where tax policy and CBI are inversely associated, given that monetization lowers the debt-servicing costs and, consequently, the tax distortions. Here, monetization is still cost free because the social planner has to take the costs of monetary instability into account. Then, using the overall social-welfare function (10), the two optimality conditions are:

$$V_\beta = C_\beta(\beta,\delta) - E_\beta(\beta) - I_\beta(\beta,\delta) \le 0 \text{ and} \quad (14)$$

$$V_\delta = C_\delta(\beta,\delta) - I_\delta(\beta,\delta) \le 0, \quad (15)$$

where strict inequality implies the corner solution (i.e. $\beta^* = 0$ or $\delta^* = 0$). In other words, if the social planner only considers "yes-no" decisions, the decisions are simple: the bank will be saved if social benefits are greater than social costs, and the same will be true for fiscal monetization (i.e. designing a completely dependent central bank).

When setting the banking policy, the social planner accepts a trade-off between two public goals: externality smoothing and tax-distortion minimization. This trade-off can be mitigated using monetary policy, but it also introduces the dilemma of monetary instability. By solving the FOC system (14-15) and using (7-9), we obtain the socially optimal choices:

$$\beta^* = 1 - \frac{1}{\varepsilon(1+\lambda)\pi}\left[\frac{\eta}{1-\eta}(1+i(1-\delta^*)) + \frac{\phi}{2}\delta^{*2}\right] \text{ and} \tag{16}$$

$$\delta^* = \frac{\eta}{1-\eta}\frac{i}{\phi}. \tag{17}$$

If we focus our attention on the central bank regime decisions, the optimal level of CBI δ^* has certain properties. It increases: a) if the labour supply is relatively inelastic, given that the corresponding tax-distortion risk is low, b) if the cost of debt servicing is low and c) if the monetary-instability costs are high. In other words, if both the distributional effect and the duration effect are likely to be low, the CBI is likely to be high. In addition, recall that higher levels of the optimal bailout policy, β^*, will increase the overall amount of debt monetization (direction effect), notwithstanding the monetization parameter δ^* is held constant.

4. Populism and Central Bank (In)Dependence

Economic policies have relevant redistributive effects, but the social planner described in the previous section is only concerned about economic efficiency. When it comes to the effects of such policies for individual citizens, the situation is completely different, as the net transfers implied by efficient policies can be largely positive for some and largely negative for others. The redistributive effects are a relevant issue as long as the policies are chosen through the political process (i.e. when the citizens are voters). In this paper, we consider majority voting with voter preferences that are associated with the financial wealth distribution.

4.1 The Demand for Central Bank (In)Dependence

In our economy, voter heterogeneity depends on financial inequality and has three possible sources: bank shares, bank deposits and bond holdings.

Given a voter *j*, let $\pi + \pi^j$ be the amount of banking shares in *j*'s portfolio at time 0. Specifically, depending on $\pi^j > 0$ or < 0, voter *j* will be a *bank owner* relative to the average. Let $F(\pi^j)$ be the distribution of the bank's ownership across the population. The ownership of the median voter will represent the extent to which the bank's ownership is concentrated.

Voters can be big or small depositors. Let $\lambda + \lambda^j$ be the amount of bank deposits in *j*'s portfolio at time 0. Depending on $\lambda\pi^j > 0$ or < 0, voter *j* will be a *bank depositor* relative to the average. Let $L(\lambda^j)$ be the distribution of the bank's liabilities across the population. The deposits of the median voter will tell us whether the depositors represent the majority or a minority of the population.

Finally, voters can be heterogeneous as bond holders. Let $(\beta + b^j)(1+\lambda)(1-\delta)\pi$ be the amount of bonds in *j*'s portfolio at time 0. Depending on $b^j > 0$ or < 0, voter *j* will be a *bond holder* relative to the average. Let $G(b^j)$ be the distribution of bond holdings across the population. The

average of $G(b^j)$ is zero. The bond holding of the median voter signals whether the depositors represent the majority or a minority of the population.

Given the general individual utility function (10) and the above definitions of π^j, λ^j, b^j, the voter *j*'s utility $V^j(\beta,\delta)$ is:

$$V^j(\beta,\delta) = V(\beta,\delta) + \beta\pi^j + \beta\lambda\pi^j + b^j(1+\lambda)\pi i(1-\delta), \qquad (18)$$

where the last three terms in RHS account for the three forms of financial heterogeneity of voter *j* relative to the average. Each voter's preferences can differ from those of the social planner because of these three terms. We assume that the financial preferences reflect the policy preferences of the voters and are expressed using majority rule through sequential voting on the monetary and banking regimes. As usual, the two voting stages are solved backwards.

Given $V^j(\beta,\delta)$, the corresponding FOC and the social optimality condition V_δ, the optimal CBI for the voter *j* is:

$$V_\delta^j = V_\delta - b^j(1+\lambda)\pi i \le 0. \qquad (19)$$

Assuming equation (19) holds as an equality, solving it yields:

$$\delta^j = \left(\frac{\eta}{1-\eta} - \frac{b^j}{\beta}\right)\frac{i}{\phi}. \qquad (20)$$

By comparing equation (20) with the socially optimal degree of CBI (17), it is immediately evident that, given a banking regime $\beta \neq 0$, voters who hold relatively more bonds would prefer CBI to be above the socially optimal level. By solving the voting game[2] and calling $m\delta$ the median voter (i.e. the voter who owns the median amount of bonds), where $b^{m\delta}$ is the median of $G(b^j)$, the CBI level $\hat{\delta}$ chosen by the majority of voters would be:

$$\hat{\delta} = \delta^* - \frac{b^{m\delta}}{\beta}\frac{i}{\phi} \equiv D(\beta). \qquad (21)$$

It is evident that the political distortion (i.e. $\left|\delta - \hat{\delta}^*\right|$) will reflect four features of our economy. More specifically, the preferred CBI level will be higher if: a) the majority of voters are bond holders, b) the interest rate is higher, c) the monetary stability costs are higher and d) the banking policy is more conservative (i.e. lower β).

The political distortions related to the central bank regime are intertwined with the banking policy choices. With regard to the latter, following the same steps as above and given the social optimality condition, V_β, the condition that pins down the banking policy, $\hat{\beta}$, chosen by the majority of voters is:

[2] See Masciandaro and Passarelli 2017.

$$V_\beta + \bar{x} + x^{m\beta} \leq 0\,, \tag{22}$$

where the parameter x^j summarizes the features of any financial portfolio, *j*, given the monetization preferences, and highlights the role of bank stakeholders (i.e. shareholders and depositors):

$$x^j \equiv \pi^j + \lambda\pi^j - b^j(1+\lambda)\pi i D_\beta\,. \tag{23}$$

The average portfolio is:

$$\bar{x} \equiv V_\delta D_\beta\,. \tag{24}$$

In general, the median voter's preferences and, consequently, the features of his or her financial portfolio will determine the actual overall equilibrium.[3] The more the politicians in charge accommodate the demand for a level of CBI that differs from the socially optimal level, the more likely a politically dependent central bank will be (Barro and Gordon 1983) owing to financial stability issues (Ueda and Valencia 2012). At the same time, if the CBI is sufficiently robust to avoid the political incentives to manipulate the both the fiscal and monetary policies in order to ensure financial stability, such incentives can be channelled using financial regulation. In other words, a politically captured regulation could be a by-product of CBI (Aklin and Kern 2016).

Under which conditions can a populist policy occur? Given the above-mentioned definition (Guiso et al. 2017), we define as populist any policy that guarantees short-term protection for bank stakeholders without regard for long-term fiscal or monetary distortions. This definition encompasses other definitions, such as those that define as populist a politician who seeks to remove the checks and balances generally applied in a democratic state (e.g. CBI) in order to fulfil promises made during the election campaign. In other words, it encompasses politicians acting as autocratic policymakers (Goodhart and Lastra 2017). In this respect, we compare the social planner solution with the autocratic planner solution.

How does the standard link between myopic policies and CBI differ from the relationship that characterizes a populist policy? In Section 1, we discussed the four key elements of the standard view, which can be summarized as follows (Fischer 2015): the CBI is an institutional device used to avoid distortionary inflation tax given the political pressure to boost real output, and this device is implemented using time-inconsistent policies (Kydland and Prescott 1977). Here, the trigger is financial inequality – not the unemployment rate – and the policy tool is the interaction among banking, fiscal and monetary policies, rather than monetary policy per se. Moreover, the inefficient macro outcome is the overall taxation design, not just the inflation tax, which is produced without any particular assumptions about the players' expectations or information sets.

Table 1, which presents all of the possible equilibria. sheds light on when and how a populist policy is likely to be designed and implemented. The columns show what happens when the median voter is a smaller/equal/larger bank stakeholder than the average voter (i.e. $x^{m\beta} \leq\geq \bar{x}$), while the rows show what happens when the median voter is a larger/equal/smaller bond holder than the average voter (i.e. $b^{m\beta} \leq\geq 0$). In every combination, the policy outcome is compared with the

[3] See Masciandaro and Passarelli 2017.

socially optimal policy. The outcome can be characterized as *efficient* if it is equal to the benchmark, *conservative* if it is more restrictive and *lax* if it more expansive. A lax banking policy can be defined as a situation of financial dominance (Smets 2013), while a lax CBI regime represents a case of fiscal dominance (Sargent and Wallace 1981).

Table 1: Median voter preferences and policy outcomes

	$x^{m\beta} < \bar{x}$	$x^{m\beta} = \bar{x}$	$x^{m\beta} > \bar{x}$
$b^{m\beta} > 0$	Conservative banking policy Conservative CBI	Efficient banking policy Conservative CBI	Financial dominance Either conservative CBI or fiscal dominance
$b^{m\beta} = 0$	Conservative banking policy Conservative CBI	Efficient banking policy Efficient CBI	**Financial dominance** **Fiscal dominance**
$b^{m\beta} < 0$	Conservative banking policy Either conservative CBI or fiscal dominance	Efficient banking policy Fiscal dominance	**Financial dominance** **Fiscal dominance**

Two relevant facts emerge. In general, voters' preferences are consistent with the socially optimal policies if and only if the financial portfolios are homogeneous. The greater the financial heterogeneity (financial inequality), the more the equilibria differ from efficient levels. More specifically, an inefficient populist policy arises when the majority of citizens are bank stakeholders who are indifferent with respect to the risk of monetary instability and/or uninterested in the nominal yields. The populist policy will promote a politically controlled central bank. When ownership of the bank and deposits are spread across the population, the majority is more interested in saving the bank than the social planner. The banks internalize this as a political incentive, which increases the risk of moral hazard. Consequently, voters are more likely to prefer more fiscal dominance (i.e. a lower CBI) in order to increase the fiscal monetization.

4.2 The Supply of Central Bank (In)Dependence

In the previous section, we showed that financial inequality can feed popular discontent with the institutional monetary establishment (Buiter 2016, de Haan and Eijffinger 2017, Goodhart and Lastra 2017, Rajan 2017). In such an environment, populist politicians who champion short-term protection policies in favour of bank stakeholders can find consensus for a monetary regime with a more politically controlled central bank. Therefore, if the existing CBI is inconsistent with such a populist orientation, it may be at risk.

The supply of central bank dependence can be easily designed. We assume that the majority of citizens are bank stakeholders, and that these voters are indifferent with respect to the risk of monetary instability and uninterested in the nominal yields. Therefore, they favour the dominance policy: financial dominance in the banking policy and fiscal dominance in the monetary policy.

Assume that the median voter, j, has a choice between a populist party, P, which offers the dominance policy, e, and a non-populist status-quo party, S, which is the incumbent party and offers the social planner policy. The periods 0 and 2 are the normal and the new normal, respectively. The median voter's expected indirect utility $V^j(\beta,\delta)$ from the two policies, P and SQ, in the new normal period are as shown in Table 2:

Table 2: Median voter utility and policy supply

	New normal
Status quo policy	$\sigma V_{SQ}^J(\beta,\delta)$
Dominance policy	$\theta V_P^J(\beta,\delta)$

σ and θ represent the voter's beliefs that the status-quo policy and the dominance policy, respectively, will be sustainable (improve/worsen) in the longer term. In other words, they indicate the likelihood of improving (σ,θ>1) or worsening (σ,θ<1) the current utility (Guiso et al. 2017). The different perceptions of the median voter can also be captured in the simplest way how he/she discount the future in a different way depending on which politician supplies the policy. A relatively impatient voter cares more about the present than the future and will prefer the populist option (Chersterley and Roberti 2016). The median voter will prefer the populist proposal if the corresponding utility is greater than the status-quo utility:

$$\theta V_P^J(\beta,\delta) > \sigma V_{SQ}^J(\beta,\delta).$$

All else equal (i.e. the greater the utility for the median voter with the dominance policy), the populist proposal with its lower level of CBI will be preferred when trust in the sustainability of the status-quo policy is lower and perceptions of the populist party's credibility are higher.

4.3 The Discipline Effect of a Resolution (Bail-in) Regime

Finally, it is worth noting that a populist policy in favour of a more dependent central bank is less likely if the banking policy is institutionally more constrained, such that it is a resolution policy in which only depositors are refunded. In this situation, the government's budget constraint is:

$$\beta\lambda\pi^{BI}(1+i(1-\delta)) = \tau y, \tag{3a}$$

where BI stands for "bail-in" solution.

For any banking policy, β, the government needs to issue a lower amount of debt and, consequently, the impact of β and δ on the tax policy is lower. In other words, both T_β and T_δ are lower in absolute value (see equations (13) and (14)). Both the direction effect and the distributional effect are lower. As the bank's shareholders lose the entire value of their shares, the consumption utility becomes:

$$l^*(1-T(\beta,\delta)) + w + \beta\lambda\pi^{BI}(1+i(1-\delta) \equiv C^{BI}(\beta,\delta). \tag{7a}$$

The externality is larger, as it does not include the benefits of partially rescuing shareholders:

$$\frac{\varepsilon}{2}\left[(1-\beta)\lambda\pi^{BI}+\pi^{BI}\right]^2 \equiv E^{BI}(\beta). \tag{8a}$$

At the same time, the monetary instability costs are lower, given that for any values of β and δ, the amount of the monetized debt is lower. This reduces the duration effect:

$$\frac{\phi}{2}\delta^2\beta\lambda\pi^{BI} \equiv I^{BI}(\beta,\delta). \tag{9a}$$

The socially optimal policies become:

$$\beta^{*BI} = 1-\frac{1}{\varepsilon\lambda\pi^{BI}}\left[\frac{\eta}{1-\eta}(1+i(1-\delta^*))+\frac{\phi}{2}\delta^{*2}\right] < \beta^* \text{ and} \tag{16a}$$

$$\delta^{*BI} = \frac{\eta}{1-\eta}\frac{i}{\phi} = \delta^*. \tag{17a}$$

The optimal banking policy is now more conservative. The optimal CBI is the same but the overall monetization is lower, as the state's intervention is smaller. At the same time, the majority's decision is now independent of the distribution of bank shares, $F(\pi^j)$. Therefore, the bank's shareholders are not influential. The policy decisions, including those related to the CBI level, will be less distorted, if they are distorted at all.

5. Conclusion

In this paper, we have presented a model of the relationships between populism and CBI. We defined populist policies as myopic policies that guarantee short-term protection for bank stakeholders without regard to long-term distortions arising from financial and fiscal dominance. Assuming financial heterogeneity (inequality) among citizens, we show that this inefficient outcome can arise when the majority of citizens are bank stakeholders, and when these voters are indifferent to the risk of monetary instability and/or uninterested in the nominal yields. Moreover, the populist policy will promote a politically controlled central bank. This result is less likely if a banking resolution scheme ties the hands of the incumbent government.

The model can be extended in many fruitful directions:

a) Financial wealth and monetary instability. This model assumes that monetary instability is a social cost that is borne equally by all individuals. Earnings on assets other than public bonds are fixed and normalized to zero. If we were to associate monetary instability with specific inflation risks, we would assume that portfolios are heterogeneous in size and in terms of the yield's ability to match monetary instability. Individuals bear a higher cost due to monetary instability when their portfolios are bigger or when they hold assets with relatively rigid nominal yields. Allowing for this kind of heterogeneity in our framework would lead to a straightforward prediction: the smaller the mass of individuals with these characteristics, the stronger the political pressure to monetize.

b) Income. In general, income distribution (Aggeborn and Persson 2017) or labour distribution (Algan et al. 2017) can explain the demand for populist policies. In our framework, if the banks are saved, the rich have a higher tax burden to bear than other citizens. Thus, all else equal, we expect richer people to desire smaller bailouts. In a society with highly concentrated income, we expect large bailouts – the poor, who are the majority, want large bailouts because the minority (i.e. the rich) will bear most of the cost. Of course, income can be correlated with other forms of heterogeneity, such as portfolio size or the size of a bank stake in an individual's portfolio. This leads to interesting trade-offs. Consider a rich individual. On the one hand, she wants a small bailout in order to save on taxes. On the other hand, she wants a large bailout because, as a large stakeholder, she is highly interested in saving the bank. The framework in this paper helps the reader solve this kind of trade-off. It is worth noting that by putting the roles of monetary instability and income together, we can address more complex heterogeneity, as the channel from unequal income gains, a Fisher channel for unexpected inflation, an interest rate exposure from real interest rate changes (Auclert 2017).

c) Initial public debt and tax pressure. As we discussed above, the model assumes that government debt is only issued to save the banks, while taxes are raised only to service that debt. These are two simplifying assumptions. Another initial setting can be imagined: in normal times: the level of taxation and the stock of public debt can be large and vary substantially by country and over time. The insertion of initial taxation and initial debt into the framework would increase its complexity but without any substantial consequence for the overall rationale.

Specifically, the interest rate, I, should be an endogenous variable that depends on the stock of debt. However, the tax policy should depend on the initial level of taxation. Consequently, we would expect more indebted countries or countries with higher levels of taxation to have less incentive to save troubled banks and more incentive to monetize debt. If the tax pressure is already high, a new tax to finance the bailout can be highly distortionary with negative consequences for the entire economy. If the debt stock is large, the market will anticipate a higher risk of a sovereign debt crisis with the consequence of an increased cost of servicing new debt. As a result, the central bank will be forced to monetize a large part of the debt to help lower the cost. We would also expect policy choices to be subject to more political distortion – as the tax burden and payments for interest increase, the majority's policy preferences diverge from those of the minority, leading to more tax distortion.

d) Foreign debt and foreign ownership of the bank. The model can be extended to account for the existence of foreign investors, and to investigate the association between external debt and populism (Dovis et al. 2016). Foreign individuals and entities do not have the right to vote. When solving the voting game, they should not be included in the distributions of bank stakes or public bonds. As a result, the political decision is highly distorted in favour of domestic citizens. If the majority is composed of small domestic investors, the policy outcome is straightforward: too small a bailout with too much monetization. The reason is that the majority of domestic voters are in the position of "tyrannizing" foreign stakeholders. A small bailout followed by high monetization is a way to make foreign investors foot a larger part of the bill. The risk of this kind of tyranny is relevant if the bank is in a small country and has many foreign customers. The "Icesave Dispute" is consistent with this theoretical prediction. In 2008, the Icelandic bank Landsbanki went bankrupt. The UK and Dutch governments covered the losses of the banks' foreign customers in full (mainly customers of the UK and Dutch branches). In a referendum on March 2010, Icelanders rejected a proposal to guarantee repayments to the UK and the Netherlands.

e) Central bank activism. Our model does not explicitly consider the central bank's behaviour. It is natural to wonder whether populist demand for CBI reform could be weakened or strengthened by the concrete monetary stance that central bankers implement. From 2008 to 2017, the ultra-expansionary monetary policies produced (and are likely to continue producing) distributional, directional and duration effects (Goodhart and Lastra 2017). Thus far, we know little about the spillovers between the demand for CBI and the supply of monetary policy. For example, some have argued that the central banks themselves are undermining the case for independence with their overly expansionary policies (Issing 2018). In the same vein, the re-normalization of monetary policy would most likely trigger a populist outcry related to the duration effect (Goodhart and Lastra 2017).

f) Financial inequality and populism. In our model, we associated financial heterogeneity with populist policies that could promote reforms of the established degree of CBI. We might wonder how such specific "monetary" populist policies are associated with specific populist movements. We might also examine how they can be considered a policy demand that can be captured by politicians looking for consensus, irrespective of their ideology, taking into account the possibility of self-fulfilling prophecies, which might explain politicians' incentives to conform to a populist view (Frisell 2006).

In other words, we believe empirical and/or institutional analyses designed to shed light on the associations among financial wealth distribution, voters' geographical locations (Inglehart and Norris 2016, Algan et al. 2017) and economic policy preferences would be interesting. At the same time, such explorations could be fruitfully correlated with the empirical results on the concrete distributional implications of recent monetary policy actions (Casiraghi et al. 2016, Furceri et al. 2016, Amaral 2017).

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