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PANDEMIC RECESSION AND HELICOPTER MONEY: VENICE, 1629-1631[^]

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Abstract

This paper analyses the monetary policy of the Most Serene Republic of Venice in the years of calamities using a modern equivalent of helicopter money, namely an extraordinary issue of (base) money, coupled with capital losses for the issuer. We treat the 1629 famine and the 1630-1631 plague as a unique negative macroeconomic shock, which the government addressed using fiscal monetization, with diverse effects on its citizens. Consolidating the balance sheets of the Treasury and of the State Bank of Issue, we show that the Republic implemented what was, in effect, helicopter money, with such policies most likely driven by political reasons, to limit public disturbances and riots.

JEL Classification: N1,N2, E5,E6,D7

Keywords: monetary policy, helicopter money, pandemic, Venice 1629-1631

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1. Introduction

Let us suppose now that one day a helicopter flies over this community and drops an additional \$1,000 in bills from the sky, which is, of course, hastily collected by members of the community. Let us suppose further that everyone is convinced that this is a unique event which will never be repeated. (Milton Friedman, 1968)

COVID-19 led to the adoption of unconventional monetary policies and a revival of interest in radical ideas, once considered taboo, such as *helicopter money* (Benigno and Nisticò 2020a, Cukierman 2021, Galì 2020, Yashiv 2020, Kapoor and Buiter 2020, Velasco et al. 2020). Indeed, whenever economic conditions become really critical, the concept of helicopter money frequently re-emerges (Masciandaro 2020).

The term “helicopter money” originates from Milton Friedman (1968), who famously imagined a situation in which freshly-issued central bank money would be randomly distributed to citizens (“dropped from the sky by a helicopter”: see opening quote above). Following Friedman’s ambiguity, however, economists have used this term with different meanings, according to the different ways the distributed money is actually issued by the central bank. On the one hand, some have defined helicopter money as a permanent increase in the *liabilities* of the central bank, thus *increasing* the value of its seigniorage (“soft helicopter money”) (Buiter 2014, Bernanke 2016, Di Giorgio and Traficante 2018, Masciandaro 2020). As such a situation has actually occurred quite often in history, “soft helicopter money” is a less radical option than it might appear at first sight. On the other hand, others have described helicopter money as a permanent decrease in the *assets* (i.e., in the net worth) of the central bank, thus *decreasing* the value of its seigniorage (“hard helicopter money”) (Galì 2020, Buiter 2014, Masciandaro 2020). With respect to “soft helicopter money”, “hard helicopter money” is a much more radical option which seems to be “unprecedented”.

But so-called unprecedented monetary policies can often have precedents (Ugolini 2020). In this article, we study one rare historical episode in which “hard helicopter money” appears to have actually been implemented. This happened in the Republic of Venice in 1629-1631 – interestingly, precisely in the context of a full-fledged pandemic which bears many resemblances with COVID-19. We describe the historical context in which fiscal monetization took place, explain why it can be considered as an example of “hard helicopter money”, and

analyse its consequences and causes. The remainder of this article is organised as follows. In Section Two we briefly describe Venetian monetary and fiscal systems and the actions of its monetary and fiscal authorities during the first decades of the 17th century. In Section Three we analyse the huge real economic shocks of 1629-1631 as well as the containment policies put in place by the Venetian government. In Section Four we focus on the "hard helicopter money" strategy that was implemented using the Giro bank and the Mint. The same Section offers a political perspective to help explain why the Republic chose this radical option rather than more classical ones. Section Four concludes. Appendix A offers more historical details on the Venetian monetary system, while Appendix B offers a theoretical model that can be used to interpret the historical narrative analytically.

2. Monetary and Fiscal Policy in the Republic of Venice

By the 17th century, Venice had reached a degree of monetization unknown for centuries anywhere else, enabling it to economize on coins – commodity money - as citizens commonly used cheques and bank transfers, even among the lower- middle class (Ugolini 2017, p.37, Mueller 1997, p.24, Fratianni and Spinelli 2006, p.271). The Republic of Venice issued both commodity money (coins) and, starting from 1587, scriptural money (bank deposits), through the establishment of two subsequent and overlapping public banks: the Rialto Bank and the Giro Bank (see Appendix A). As usual, commodity money represented the monetary anchor; for example, the estimates of the state revenues could easily be converted into kilograms of silver (Alfani and Di Tullio 2019, p.32).

Compared with normal late medieval conditions, the relative size of the State, compared to the domestic economy, was extraordinarily high (Ugolini 2017, p.37). In the real sector, the government, via the Grain Office and then the Fodder Office, was active in the grain market, in order to address and to stabilize the volatility of food supply, including its pricing,

which was an extremely sensitive political issue (Ugolini 2017, p.37). In banking activities the financial district of Venice – the Rialto area – was entirely owned by the Republic, which then rented to the private bankers the benches at which they used to operate (Ugolini 2017, p.39), and their books were considered public records, the bank transfers being a legal way to discharge debt under Venetian law (Sissoko 2007, p.7, Ugolini 2017, p.39).

Yet the ideal that inspired the Venetian government was that, as far as possible, [the State should not replace](#) private initiative in markets (Dunbar 1892, p. 308, Ugolini 2017, p.38). The Senate was the body that designed the Republic's economic policy, with its committees responsible for overseeing every aspect of production and distribution (Rapp 1976, p.139). With the Republic being firmly controlled by an oligarchy of merchants, the government's goal was just to provide the services that were on the one hand essential for business, and on the other hand too expensive and/or too risky to be provided by the businessmen themselves (Ugolini 2017, p.38). This feature of the Venetian economy implies that in normal times fiscal monetization was not needed. As a result, in tranquil years the Republic generated substantial fiscal surpluses in order to repay all its debt (a goal which had been fully attained, for instance, in 1600), thus enhancing its reputation and creditworthiness (Sissoko 2002, p.8, Fratianni and Spinelli 2006, p. 263, Alfani and Di Tullio 2019, p.172).

[The Republic's tax system was rather muddled and complicated](#) (Alfani and Di Tullio 2019, p.24), with both "direct" and "indirect" taxation present (Alfani and Di Tullio 2019, p.27). More importantly, the Venetian taxation system had a marked "regressive" nature (Alfani and Di Tullio 2019, p.147). From the second half of the sixteenth century until the 1620s the Republic of Venice increased taxation: data show a moderate increase in per capita taxation from the 1550s to 1620s – between 6.5% and 16.1%, depending on the adopted metrics - and then the per capita burden grew much more markedly in the aftermath of the 1630 plague (Alfani and Di Tullio 2019, p.33).

[The earliest evidence for public debt issue dates back to 1164 for Venice, when the debt of the state was called *Monti* \(Funds\).](#) In Venice both voluntary lenders and forced lenders were present (Fratianni and Spinelli 2006, p.264). Compulsory lending was usually based on the assessments of one's wealth (Pezzolo 2003a, p. 64, Fratianni and Spinelli 2006, p. 262, Pezzolo 2007, p.2). Such compulsory lending was, in effect, a device for taxation, as was the practice of

delaying the interest payments for many years (Fratianni and Spinelli 2006, p. 263). Such compulsion was progressively replaced with a more market-friendly approach to debt management (Fratianni and Spinelli 2006, p. 263), using instalment payments for collecting money from the private sector (Fratianni and Spinelli 2006, p. 263) on a voluntary basis (Pezzolo 2007, p.2). The Republic issued both floating and funded (long-term) debt,¹ though usually the role of floating debt was limited (Pezzolo 2003a, p.61).

So, at the beginning of the 17th century the state of public finance in Venice was good (Pezzolo 2003a, p.103) as well as the reputation and creditworthiness of the Most Serene Republic (da Ponte 1801, p.9, Fratianni and Spinelli 2006, p.263); the government offered 4% bonds just for investment opportunities (Sissoko 2002, p.8), while the long-term return from trade was estimated to be 6.4% per annum (Sissoko 2007, p.6). In 1632, i.e. only one year after the fiscal crisis described here below, the holders of the Venetian funded debt received a return of 5% (Pezzolo 2003a, p.65).

As far as its political system is concerned, the Republic of Venice had an oligarchic government, run by a small élite of aristocrats (“patricians”). Some clarification is needed about the notion of citizenship. In early modern times “to be a citizen took on different meanings and involved different categories according to places and periods” (Pezzolo 2007, p.9). Residing and working in Venice were not sufficient conditions to gain access to public services; only the rights of citizenship gave complete access to local welfare, guaranteeing protection in times of crisis (Alfani and Di Tullio 2019, p.59-60). In fact, only the patricians had political authority, assisted by the citizens, who carried out bureaucratic tasks; ordinary people, neither patrician nor citizen, were excluded from any political or administrative participation (Finlay 1980). Yet, although formally excluded from any involvement in politics and institutions, ordinary Venetians used civil

¹ The turning point for Venetian monetary and fiscal policy was the War of Chioggia (1378-81), the harsh conflict that solved the long-dated rivalry between the Republics of Venice and Genoa for the control of Mediterranean trade routes, ending with Genoa’s definitive defeat (also see Appendix A). Up to that time debt issuance had been relatively limited (Mueller, 1977, p.221). In 1382 the government started to borrow from anyone who had wealth (Mueller, 1977, p.222), but normally the largest holders of government securities came from the élite governing the Republic (Pezzolo 2007, p.15, Alfani and Di Tullio 2019, p.5 and p.172). Borrowing occurred without using intermediaries between lenders and the government, as it was the case for example in Florence (Pezzolo 2007, p.6). In this respect, “in cities run by oligarchies the debt relied on a sort of impersonal market, where as a rule all creditors enjoyed the same rights and suffered the same damages” (Pezzolo 2007, p.7). As far as foreigners were concerned, generally they became debt owners, but with limitations (Pezzolo 2007, p.9). In Venice the share of foreign owners grew during the seventeenth century: in 1641 one seventh of the consolidated debt was owned by foreigners (Alfani and Di Tullio 2019, p.172).

rituals, crowd behaviour, and collective actions to influence patricians' decision making, especially in times of crisis (van Gelder 2018, p.254, de Larivière 2020, p.72).

3. The 1629-1631 Macroeconomic Shocks

In 1630 Venice was hit by a bubonic plague (Lazzari et al., 2020, p.2). Originated in Northern Europe in 1623, this pandemic crossed the Alps in 1629, in the case of the Republic of Venice likely carried by Imperial armies on their way to Mantua (Parrot 2018, Lazzari et al., 2020, p.2). In general, war, famine and epidemics were strictly associated in the preindustrial world (Luzzato 1954, p.174 and 1961, p. 35,310, Alfani, 2013, p.443). In this case, and starting from March 1629, French and Spanish troops crossed the Alps to the west and north to participate in the War of the Mantuan Succession (Alfani and Percoco, 2019, p.1171).² The massive outbreak in the city of Venice took place later, between September and December 1630 – 20,923 deaths – with a peak in October 1630 (Ell, 1989, p.130), and in total 43,088 deaths were recorded over just three years; the population of Venice was 141,625 in 1624 and became 102,243 in 1633, a reduction of nearly 30% (Lazzari et al., 2020, p.3). Such figures are consistent with the 35% estimated mortality in Northern Italy during the same epidemic ³, and should be compared to an estimated average annual mortality of between 3.7% and 2.7% in normal times (Lazzari et al. 2020, p.3).

The consequences of the epidemic on various sub-groups were different. Younger people – the zero to seventeen age group - seemed to be relatively more spared; yet the picture concerning the age effects of the plague remains otherwise rather confused (Weiner 1970, p.46). The upper classes – nobility and civil servants - seemed to be less affected by the epidemic (Weiner 1970, p.47-48). Moreover, the percentage of females became greater than

² The War of the Mantuan Succession (1628-31) was an Italian episode of the Thirty Years' War (1618-1648) fought on a European scale between supporters and opponents of the Habsburg monarchies. After the death of the heirless Duke of Mantua, two claimants to the succession appeared (the Duke of Guastalla and the Duke of Nevers). The Holy Roman Empire, Spain, and Piedmont supported Guastalla's claim, while France and Venice supported Nevers' (Vecchiato 1994, p. 423). The military outcome being unclear, the conflict was resolved by a political accord (Treaty of Cherasco, 1631), confirming Nevers as Duke of Mantua.

³ According to Alfani and Di Tullio, (2019, pp. 114-155), "in the whole of northern Italy the 1629-1630 plague would have killed 30-35% of the overall population"; as far as Venice is concerned, they refer to the "estimate of a 40% overall mortality in the Republic proposed by Beltrami (1961)".

that of males (Weiner 1970, p.49) and the plague seems to have led to a substantial increase in the marriage rate during the following decade (Weiner 1970, p.51), while there was a tendency for families to be smaller - up to four members only - than were those before the plague (Weiner 1970, p.52).

While traditionally this epidemic has been considered a short-run disaster with limited long-run impact (Rapp, 1976, p. 154), (also considering that plague outbreaks recurred frequently from the first half of the sixteenth century (Palmer 1978, p.328-337)), more recently it has been treated as a crucial turning point in the economic and social development of the Republic (Alfani and Percoco 2019, p. 1197). More specifically, the 1630 plague provided a structural break in the way in which some macro-level variables – population density, urbanization and taxation per capita - affected wealth inequality (Alfani et al. 2020); the plague put the Republic of Venice on a lower growth path, favouring the rise of Northern Europe, but also within Italy, allowing for the rise of the Sabaudian State in the northeast of Italy (Alfani 2020).

The year before the pandemic outbreak, the Republic had already coped with a famine.⁴ In the preindustrial world, extreme hunger has often been correlated with war and disease (Bertagni 1889). In the Italian states, the first decades of the seventeenth century were characterized by severe food shortages (Alfani 2018, p. 152). In Venice from 1629 to 1631 there was indeed a combination of war, famine and plague - the so-called “Three Horsemen of the Apocalypse” (Alfani 2013, p.43). In reality, however, the interactions between wars, famines and epidemics are more complicated than generally assumed; in particular, it is difficult to establish a solid causal link between hunger and disease (Alfani 2013, p.44). In general, in the city of Venice famine episodes were not particularly intense, given its capacity to collect grain from its territories and the rest of the Mediterranean (Todesco 1989, p.11), but this came at a sizable cost for the government, which sold the grain at subsidized prices to the population (Ugolini

⁴ On April 24, 1629, the Podestà (governor) of the mainland city of Bergamo, Valier, wrote to the Venetian Senate, complaining about the fact that the famine was severely hitting his territory (Pederzani 1992, p. 258). According to archival evidence, the price of wheat in Bergamo, which had fluctuated between 40 and 60 liras during the year 1627, reached an extreme height of 140 liras in 1629, to come back to a range between 20 and 60 liras in the years 1631-33 (Archival source: Biblioteca Civica Angelo Mai, Bergamo, 1.2.18.10.5 Calmieri dei cereali, 11, class. 1.2.18.10.5-11 (pr. 26781) 1627 gennaio - 1627dicembre;13,class.1.2.18.10.5-13(pr.26783)1629 gennaio - 1629 dicembre, 14, class. 1.2.18.10.5-14 (pr. 26784) 1631 gennaio-1631dicembre;15, class. 1.2.18.10.5-15 (pr. 26785) 1632 gennaio - 1632 dicembre ;16, class. 1.2.18.10.5-16 (pr. 26786) 1633 gennaio - 1633 dicembre).

2017, p.37). From a fiscal viewpoint, the war and famine had already put considerable pressure on public finances before the pandemic struck. From an economic and social viewpoint, however, the structural break for Venice was the 1630 plague (Alfani and Percoco 2019) and not the 1629 famine, as daily life dramatically changed with the outbreak of the plague in September 1630.⁵

One unconventional indicator is that in 1629 the musical life of Venice witnessed a special year, with foreign musicians visiting the city to meet its musicians - the most famous of whom at that time was Claudio Monteverdi – and a rich production of Venetian music. But when the plague reached Venice, the music publishing trade was decimated: whereas in 1629 fifty collections of music were printed, in 1630 production dropped to around thirty, and then no collections are registered in the Venetian presses in 1631 (Gonzaga Band, 2018).

Another similar indicator can be found in the market for paintings in Venice (Etro and Pagani 2012 and 2013). Whereas several artists – such as Tintoretto, Zanchi and Tiepolo – took up the challenge of representing the 1630 plague (Gear 2017), the pandemic caused a drastic reduction in the number of traded artworks. Not only was spending money on art not a priority, but also many painters died during the plague, causing a reduction in average prices (-81%) (Etro and Pagani 2010).

To address the pandemic, the Senate had to decide immediately its policy action. During the previous 1576 pandemic the Venetian government had reacted slowly, both denying the plague and downsizing the number and nature of deaths (Preto 1979, p.123, Palmer 1978, p.50-238-241-275). The first and most urgent issue consisted of protecting public health by designing and implementing a containment policy. In the Republic of Venice, urban mortality rates during 1630-1631 were severe, ranging from 433 per thousand in Chioggia to 615 per thousand in Verona, while in Venice itself the mortality rate was 330 per thousand (Alfani and Di Tullio 2019,

⁵ On August 22, 1630, Venetian authorities convened a commission of 36 physicians in order to evaluate the nature and the diffusion of the disease; the majority of the commission - 28 members on 36 - were opposed to declaring that the disease was of pestilence nature, notwithstanding plague episodes had already been signaled in the Venetian mainland the "*Terraferma*" (Preto 1979, p. 141). On April 4, 1630, the Bergamo authorities had already noted that an outbreak of plague was outbreaking the making (Archival source: Biblioteca Civica Angelo Mai, Bergamo, 60, class. 1.2.3.1-60 1629 dicembre 15 - 1632 maggio 22 "Consiliorum" pag 62-63).

p.115); this plague can be considered a Black Death-like event considering both overall mortality and its ability to spread in the countryside (Alfani and Di Tullio, p.114).

Containment (lock-down) policies save lives, but in parallel they have economic costs, and this was the case also in Venice then (Pullan 1964, p. 407-426, Palmer 1978 p.41, 142-143, 156, 271-275, Biraben 1973, p. 49-61, Mueller 1979, p.71-76). In general, European governments implemented stringent quarantine rules, designed to check plague epidemics, but paralysing also the economy (Pullan 1964, p .409). Venice had implemented its first legislation to address a plague epidemic in 1423 (Palmer 1978, p.51) and a Health Office was established in 1490 (Palmer 1978, p.85). Over the years, Venice developed regulation on plague with three aims: to prevent it originating in Venice, to impede its importation, and to check its spread should it break out in the city (Palmer 1978, p.123). During the 1575 plague episode, the Republic imposed a general blockade on all neighbouring territories suspected of being infected by the plague (Pullan 1964, p .409). “Unemployment, which began among second-hand clothiers and all – from schoolmasters to mountebanks and tavern-keepers - whose living depended on assembling crowds, soon spread by these means to all sections of the people” (Pullan 1964, p .409, Palmer 1978, p.142).⁶

The Health Office used its authority to close shops, as well as to prohibit auctions and weekly markets (Allerston 1996, p.279). These measures hit the majority of Venetians, who became unable to work during pandemics, and were then obliged to find ways to get money, seeking public charity, or remaining engaged in their activities; illicit and irregular trading increased ((Pullan 1960, p.26, Biraben 1973, p. 145, Cipolla 1976, p.42, Allerston 1996, p.292, 295).

The containment measures “were carried into effect on a colossal scale with full resources of the state” (Palmer 1978, p.142). A textile merchant pleaded for the quarantine to be lifted, given that “an incomparable greater number of people has died purely as a result of unemployment than of typhus or any other contagious disease” (Pullan 1964, p.409); Verona was reported to be suffering more from the ban than from the disease itself (Palmer 1978,

⁶ Lockdown measures were also implemented; the workers of the Venetian Arsenal were confined for as long as two months (Preto 1979, p. 144).

p.275). Bribery episodes were registered, merchants being anxious to get their goods into Venice (Palmer 1978, p.231 and p.235). Also the regular activity of the Mint suffered during the plague episodes (Stahl 2001, p. 42-53).

The government was aware of such negative effects on economic activity, so it then tried to alleviate its citizens' losses (Pullan 1964, p.410, Cipolla 1976 , p.41, Biraben 1973, p.57). In normal times, social expenditures were very low in Venice: for example, available data for 1602 and 1633 – i.e. before and after the pandemic – show that social expenditures were negligible, amounting respectively to 0.2% and 0.4% of total expenditures; in the same years the service of debt amounted respectively to 8.2% and 19.9% (Alfani and Di Tullio 2019, p.167). But during a pandemic, things were different.

In practice, during the 1630 pandemic the government bought necessary goods from merchants⁷ (Ugolini 2020) to distribute them in the city, as it had already done during the 1575 plague episode (Pullan 1964, p.409).⁸. Effectively both the merchants (selling goods to the government) and the inhabitants of the affected city districts (receiving goods bought by the government) were subsidised. When districts were put in quarantine their inhabitants were provisioned by the State (Palmer 1978, p.143). Poor laws were promoted to reduce the risk of disease; "poor should be taken from their wretched housing (...) and that camps for the purpose should be maintained until the end of the epidemic." (Palmer 1978, p.144 and p.215). The overall fiscal effort to help citizens included subsidies and other fiscal help given to affected communities, and distributions of free rations of grain (Alfani 2018, p.162). When decisions to

⁷ On December 3, 1630, the civil authorities of the city of Bergamo expressed increasing concern about the growing debt that the municipality was accumulating to address the costs of the pandemic (Archival source: Biblioteca Angelo Mai, -60, class. 1.2.3.1-60 1629 dicembre 15 - 1632 maggio 22 "Consiliorum" pag 108-109).

⁸ Between December 1628 and November 1629 (i.e., during the early times of the famine), the Venetian Fodder Office ("Provveditori della Biave") had already sent to the mainland territories more than 236,000 ducats worth of grain, a sum which roughly corresponded to 10% of the Republic's total expenditures during the "normal" year 1633 (Pezzolo 2006, p. 84). The authorities of Vicenza and Treviso did not obey letters from Venice that ordered them to send grain to other territories (Lombardini 1963, p.27); similar letters were sent to Bergamo (Archival source: Biblioteca Civica Angelo Mai "260, class. 1.2.2.1-260 1629 dicembre 29; Venezia, "in nostro ducali palatio", "1629 29 decembris. Solutio datii traversini per territorium cremense pro bladis", p. 264) and to Verona (Archival source: Archivio di Stato di Verona, 34 ,1625 lug. 8 - 1630 mag. 31, "Registrum Litterarium Ducalium", p.171).

destroy supposedly infected goods were made compensation was paid, though not always in full (Pullan 1964, p.251,319, Allerston 1996, p.278, 287).

Furthermore, the Venetian government influenced employment and nominal wages in the sectors under its total, or partial, control, including all the practical activities strictly related to health policy, including the hiring of body clearers, who got paid huge salaries during pandemics (Allerston 1996, p.296). Regarding for example wages in the Arsenal, the government, “in its anxiety to prevent so vital trades from decaying, was accustomed to pay its workers something, even if there was nothing for them to do” (Pullan 1964,p .420). Earlier during the 1575 pandemic a program of public works had been designed (albeit finally not implemented) in order to give the unemployed people a livelihood in addition to victualling (Palmer 1978, p.275). Such fiscal transfers helped directly, or indirectly, citizens in trouble, with their unstable sources of income, particularly those in the lowest classes, which represented the largest part of the overall population: such citizens were often in debt (Alfani and Di Tullio 2019, p.62), and at greatest risk of crossing the boundary between subsistence and poverty, especially during famines and plagues (Alfani and Di Tullio 2019, p.63).

4. Helicopter Money in Venice: Consequences and Causes

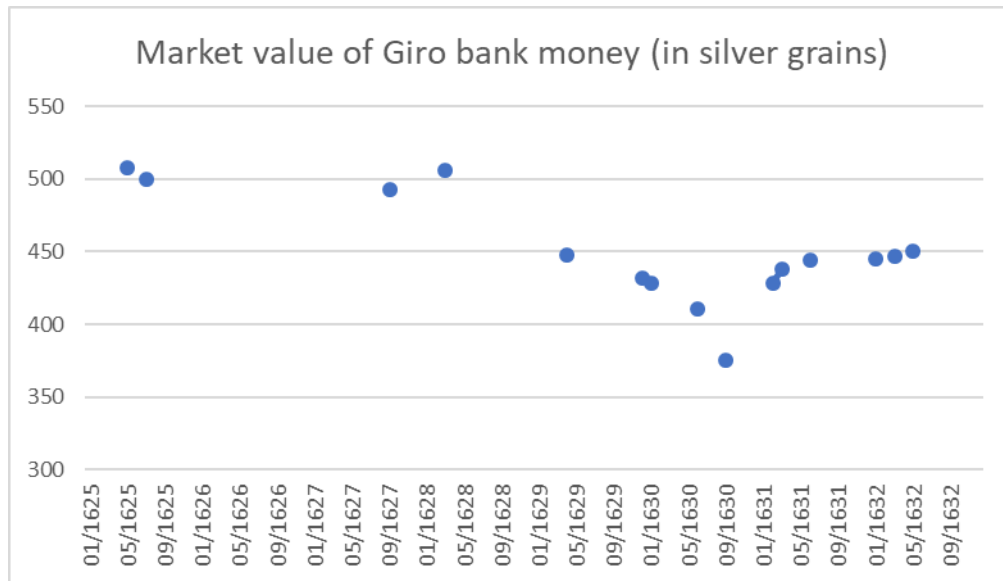
The 1629-1631 famine and plague thus obliged the Venetian government to implement transfers on a colossal scale, but how was such a huge fiscal expansion financed? On the one hand, taxes were raised. The government established a lump-sum wealth-tax to address the increasing public expenditures due to the containment policy needs (Preto 1979, p.144, Pezzolo 2003a, p.69).⁹ However, the plague had made tax collection more difficult, increasing the fiscal pressure (Pezzolo 1994, p.322-323, Alfani and Di Tullio 2019, p.29). To help alleviate such pressures, the government also allowed Jews to lend on collateral outside of the ghetto (Preto 1979, p.144, Allerston 1996, p.293). On October 16, 1630 the Senate itself took a 10,000 ducats loan from the Jewish community (Preto 1979, p.144). But such measures were far from enough for financing the whole fiscal expansion.

⁹ On August 4, 1629 another lump-sum wealth tax had already been levied during the famine episode (Pezzolo 2003b, p.110, and Pezzolo 2021, p.74); moreover, the “duties” – i.e. the set of taxes that affected the transit and consumption of goods (Alfani and Di Tullio 2019, p.24) were increased two times in 1629 and one time in 1630 (Pezzolo 2021, p.71).

To deal with its worsening deficit, the Republic had to resort to fiscal monetization through the scriptural money issued by the Giro bank (Ugolini 2020). In fact, the government paid its creditors by merely crediting their current accounts at the Giro bank (see Appendix A). The size of the Giro bank balance sheet, which had generally been less than 1 million ducats in the 1620s (Soresina 1889 p.19, Roberds and Velde 2014, p.24), rose to 2,071,168 ducats in April 1630 (Soresina 1889, p.23, Siboni 1892, p.290), and surpassed 2,666,926 million ducats in June 1630 (Soresina 1889, p.29, Roberds and Velde 2014, p.24). The Giro bank liabilities kept increasing in concert with the famine and the bubonic plague (Soresina 1889, p.29). While the liabilities of the Giro bank kept rising considerably, the asset side of the bank's balance sheet underwent a serious deterioration: the coin reserve was decreasing, while the amount of floating government debt was spectacularly increasing. In view of the fact that fiscal monetization was actually decreasing the net worth of the bank, we interpret this episode as an historical illustration of the "hard helicopter money" strategy.

The "hard helicopter money" policy put in place by Venetian authorities triggered a number of serious consequences. First, the growth of the Giro bank crowded out the activity of the Rialto bank (Ugolini 2017, p. 44). The balance sheet of the Rialto bank reached its peak of 1.7 million ducats in 1618, i.e. one year before the establishment of the Giro bank; in 1630, the amount of deposits of the Rialto bank dropped to 56,185 ducats (Sissoko 2002, p.8, Pezzolo 2018, p.155). The Rialto bank ended its activity in 1637 (Siboni 1892, p. 290). Second, the monetary expansion caused a depreciation of the value of bank money. Up to 1625 the premium between bank money and coin was positive and substantial (Roberds and Velde 2014, p.24; see Appendix A). Then from 1625 the premium began to fall, slowly at first and then precipitously in 1630 (Roberds and Velde 2014, p.24) becoming negative (Soresina 1889, p.29); the *agio* was 20% in 1624, then it dropped to 19.5% in 1629 and fell into negative territory – 10% - in 1630 (Pezzolo 2018, p. 156). The falling value of Giro money can be confirmed by looking at its market value in terms of silver. As shown in Figure 1, during the 1629 famine Giro bank money had already lost 10% of its silver value, and during the pandemic (in September 1630) it was down as much as 25% with respect to its pre-crisis valuation.

Figure 1: Market value of Giro bank money (in silver grains)



Source: Mandich (1957, p. 1173).

The over-expansion of the money supply thus quickly triggered a substantial monetary depreciation (Soresina 1889, p.29, Roberds and Velde 2014, p.24), forced the government to backtrack on its “hard helicopter money” strategy and reform its monetary policy setting. Already in July 1630, a monetary board (*Inquisitori del Banco Giro*) (Giro bank Inspectors) was established, having three aristocrats as members (Soresina 1889 p.23, Siboni 1892, p.290, Roberds and Velde 2014, p.24). The aim of the monetary action was the reduction of the Giro bank liabilities - i.e. the scriptural money supply – whose parallel effect had been the reduction of the commodity money assets in the hands of the Republic – i.e., the reduction of the net worth of the Giro bank. These reforms were made effective on September 24, 1630 (Soresina 1889, p. 26).

The accounts of a number of separate administrations and public concessionaries – worth 716,652 ducats – were removed from the Giro Bank and transferred to the Mint (Soresina 1889 p.25-26, Roberds and Velde, p.24). Private depositors were moreover invited to convert their Giro bank liabilities into “Mint deposits”, paying 7% interest (Soresina 1889, p.26, Siboni 1892, p.290, Roberds and Velde 2014, p.25). As the so-called “Mint deposits” were not current account deposits but inscribed bonds (Pezzolo 2003a), this amounted to the conversion of

unremunerated sight liabilities into interest-bearing long-term bonds. Furthermore, Mint revenues from sales of life annuities at 14% were applied to the Giro bank (Soresina 1889, p.26; Roberds and Velde 2014, p.25) to strengthen its financial position. These combined operations reduced the Giro balance sheet and then the money supply, thus allowing for a reappreciation of the bank money (see Figure 2). But this came at the price of an increase in the funded public debt. [As the reforms produced a substantial improvement in the quality of the bank's assets \(thus increasing its net worth\), they actually reversed the "hard helicopter money" strategy previously enacted.](#) Because the Giro bank was a State bank with no paid up capital, the operation actually amounted to a bailout of the State bank by the government.

To avoid trading speculation between the different kinds of money, the convertibility promise became available only to non-temporary account holders (no less than three days) (Soresina 1889, p.25, Roberds and Velde, 2014, p.24). As revealed by the collapse of the "agio" and by Figure 1, during the ["hard helicopter money" episode](#) a "flight to quality" phenomenon had occurred – the citizens preferred coins instead of deposits, whether of the Giro or Rialto banks. Ultimately conversion of bank liabilities into coins were suspended in 1630 (Soresina 1889, p.29, Siboni 1892, p.290, Dunbar 1893, p.211, Inclimona 1913, p.155). 100,000 ducats' worth of small change in copper was minted and distributed to members of the silk and wool trade, who needed it to repay their Giro debt (Soresina 1889, p.25, Mandich 1957, p.1169, Roberds and Velde 2014, p.24). Finally, anyone was allowed to pay taxes not only with bank transfers, but also with coins (Soresina 1889, p.25, Roberds and Velde 2014, p.24). In parallel, the obligations for payment settlement in Giro transfers were reduced (Soresina 1889, p.26). Both decisions seem consistent with the aim of reducing the demand for Giro transfers, which in turn could help the deleveraging of the Giro bank. Overall the disorder in the Giro bank, coupled with an exaggerated increase of debt, induced the authorities to consider the possibility of implementing a complete extinction of monetized debt, by closing the bank (Soresina 1889, p.26-27, Siboni, 1892, p.290).

The new monetary policy strategy brought down Giro balances to 1.4 million ducats at the end of 1630 (Soresina 1889, p.29, Roberds and Velde 2014, p.25), but it was not sufficient to restore convertibility on demand of Giro bank liabilities (Dunbar 1892, p.327 and p.330). Moreover the government was not able to stabilize the Giro balance sheet below 900,000

ducats until 1638 (Roberds and Velde 2014, p.25), which from then on can be considered the usual amount of the Giro bank balance sheet (Pezzolo, 2021, p.96).

Summing up, and treating the amount of 800,000 ducats as the issuing target in normal times (Tucci 1973: also see Appendix A), the monetary policy implemented during the pandemic recession years produced an over-expansion of scriptural money coupled with losses in issuer capital – the state bank had to be bailed out by the government – [which corresponds to the definition of “hard helicopter money”](#). Moreover, although the government avoided any debasement policy (Mandich 1957, p.1155), convertibility on demand of scriptural money into coin had to be suspended. This episode was not isolated; in Venice the over-production of money created from time to time currency depreciation and uncertainty, harming trade and commerce (Magatti 1914, p.258-261); in 1627 the Republic had already felt the need to reinforce monetary regulation, strengthening Giro bank accountability (Soresina 1889, p.20-22).

[Ex post, price instability \(Preto 1979, p.114\) – “an unprecedented rise in prices has been the worst blow of all”, as argued by a contemporary observer \(Cohen 1988, p.134-5\) - and currency devaluation \(Ugolini 2020\) were the final macroeconomic outcomes. So, it is unlikely that the “hard helicopter money” strategy that the Giro bank implemented was socially optimal. Moreover, it has been noticed \(Pezzolo 2003a, p.64\) that the relatively severe indebtedness of the Giro bank was not particularly dramatic from the viewpoint of public finance, as at that time the Republic’s budget recorded yearly incomes for around 3.5 million ducats.¹⁰ Meanwhile Fiscal Dominance was in place, with the Venice Senate completely controlling the Giro bank governance \(Anonimo 1847, p.364, Soresina 1889, p.8, Dunbar 1892, p.312,321\). So why did the Venetian authorities choose to implement such a suboptimal strategy – only to quickly backtrack from it? To answer this question, it is natural to examine possible links between fiscal monetization and political pressures.](#)

In the Republic of Venice at that time wealth was extremely polarized (Alfani and Di Tullio 2019, p.105-106), with both the top and the bottom of the wealth distribution socially distancing themselves from one another, as well as from the middle classes (Alfani and Di Tullio 2019, p. 112). Such wealth inequality was a relevant economic and historical issue among

¹⁰ The Republic’s fiscal income was worth 3,861,827 ducats in 1621 and 2,949,888 in 1633 (Besta 1912, pp. 464-475 and 486-493).

Venetian citizens (Alfani and Di Tullio 2019, p.1). Unfortunately it is impossible to produce a similar reconstruction for income inequality, due to the lack of the data needed (Alfani and Di Tullio 2019, p.9).

In Venice the politicians in charge (i.e., the patricians) will have cared about inhabitants' wishes. When calamities occurred, public institutions reflected the expectations of the local population (Alfani 2018, p.162). The population, especially that in the cities, was watchful of the activities of the governments, and was ready to cause major disturbances if they became convinced that the government was not doing all it could, and should have done, to ensure the availability of food, guaranteeing the "right to bread" (Alfani 2018, p.162). Ordinary inhabitants, although formally excluded from any involvement in political affairs, were able to influence patricians; and all public bodies, including the Senate, were completely ruled by patricians (Finlay 1980). Indeed, Venice [had](#) institutional mechanisms (dispersion of power, election rules, term limits) that, at least in principle and particularly in extraordinary times, could have influenced patricians towards general interest policies (de Lara et al. 2008, Puga and Trefler 2014, Smith and Al-Bawwab 2017).

Moreover, the government had much to fear, also in terms of personal safety, from riots motivated by distributional reasons – the "injustice" (Alfani 2018, p.162) – so the incentives to act for the politicians were really strong (Alfani 2018, p.162). Indeed, most popular riots in those years seem to have been caused by "political" claims (Alfani and Di Tullio 2019, p.13). Inhabitants' preferences mattered, although even full citizenship did not guarantee full "political" rights as those were reserved for the patriciate (Alfani and Di Tullio 2019, p.61).

We can draw some insights from our analysis. The extraordinary expansionary monetary policy that was implemented in Venice during 1629-31 can be considered optimal from the perspective of poor inhabitants. In this respect, the government decision can be considered consistent with the aim of pleasing the majority of inhabitants during a big macroeconomic downturn, thus enhancing consensus and avoiding riots. [The theoretical framework behind this interpretation is illustrated in Appendix B.](#)

Therefore, our interpretation of the monetary stance in Venice during the 1629-1631 period is as follow: the government, in order to avoid riots and disturbances, implemented a massive fiscal policy that was financed through [a "hard helicopter money" strategy](#); the money

supply excess quickly triggered monetary instability, and the government was forced to partially sterilize such money creation, suffering losses (the bank of issue had to be bailed out, and losses covered by future tax revenues). Such an extraordinary monetary expansion coupled with losses for the money issuer, fits exactly the modern definition of “net-worth”, “hard helicopter money”. In a sense, a redistributive monetary policy was implemented. However, the policy was financed by earmarking future tax revenues for the payment of debt service. Because taxes were strongly regressive in Venice, this means that short-term redistribution in favour of the poor was offset by a long-term redistribution in favour of the wealthy. Indeed, this policy did not cause a permanent change in the condition of poor citizens, since analysis of income distributions shows that the 1629-31 pandemic did not trigger a phase of sustained inequality decline on the same scale as the Black Death (Alfani and Di Tullio 2019, p.116, Alfani 2020, p.204).

5. Conclusions

Recently, monetary policy theory highlighted the relevance of the way interventions are orchestrated between the central bank’s and the government’s balance sheets (Sims 2003, Reis 2015, Orphanides 2016, Benigno and Nisticò 2020b). In particular, radical options like the so-called “hard helicopter money” (reducing the central bank’s net worth) have been discussed as a possible strategy to cope with extraordinary macroeconomic shocks such as pandemics. However, episodes in which the “hard helicopter money” strategy has been actually implemented appear to be very rare in history. In this article, we have focused on one historical example in which a pandemic recession was actually addressed through the implementation of a “hard helicopter money” strategy.

In the Republic of Venice, the 1629 famine and the 1630-1631 plague caused a unique negative macroeconomic shock, that the oligarchic government addressed using a particularly radical form of fiscal monetization that corresponds to the modern notion of “hard helicopter money”. As a matter of fact, the expansion of the bank of issue’s liabilities was associated with a deterioration in the quality of its assets, thus producing capital losses to the issuer and reducing its net worth. This policy entailed monetary depreciation and instability, so that the

government had to reverse it very quickly – i.e. before the end of the macroeconomic shock. Backtracking on the “hard helicopter money” strategy implied covering the losses suffered by the issuer: this actually took place through a de facto government bailout of the bank of issue, as the bank’s sight liabilities were converted into long-term public debt.

Why did the government choose to implement this suboptimal strategy? We argue that they did so to avoid political disturbances and popular rioting. Thus, in the short term, potential political and social consequences of the macroeconomic shock were minimized by implementing a redistributive policy from the rich to the poor. But in order to keep the monetization mechanism viable and prevent a complete debasement of bank money, the quality of the assets side of its balance sheet had to be restored: losses had to be covered through a bailout. However, it is worth underlining that in the long term, the conversion of sight bank liabilities into long-term debt actually reversed the distributional effects triggered by the “hard helicopter money” strategy: as taxes were strongly regressive in Venice, the ensuing conservative fiscal policy which allowed repaying the debt entailed a redistribution of resources from the poor to the rich.

The history of the Venetian reaction to the 1629-1631 famine and pandemic echoes many aspects of the COVID-19 crisis. For one thing, it proves that nowadays’ extraordinary fiscal expansion to cope with a pandemic were far from unprecedented. Moreover, it suggests that nowadays’ central bankers’ refusal to embark into some “hard helicopter money” experiment may have been a good idea after all. More generally, the Venetian experience with “hard helicopter money” highlights the economic and political importance of the redistributive effects of monetary policy action.

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Appendix A: Money and State Banks of Issue in Venice

The Republic of Venice issued both commodity money (coins) and, starting from 1587, scriptural money (bank deposits) (Dunbar 1892, p. 309 and p. 321), while private bankers were active even before then (Usher 1934, Lane 1937), precisely from 1164 (Fратиanni and Spinelli 2006, p.269).

Regarding commodity money, the mint of Venice was active since 814, issuing coins that progressively came to dominate Mediterranean trade from the thirteenth century (Stahl 2000, Day 2003). Coinage was essential for trade reasons; but at the same time the mint produced relevant revenues for the Republic (Stahl 2001, p.42). Evidently in preindustrial times the economics of minting (Sargent and Velde 1997a and 1997b, Redish and Weber 2011) was essential to address the never-ending trade-off between monetary stability and seigniorage.

The crisis of the War of Chioggia (1378-81) can be considered a turning point, given that this fiscal emergency led the Venetian government to implement a debasement policy, altering the standard of its coins (Stahl 2000). The early fifteenth century saw reforms to both gold and silver mints (Stahl 2000, Day 2003). The debasement strategy was a policy that governments frequently implemented in response to negative macroeconomic shocks (Kindleberger 1991).

Regarding scriptural money, on April 1587 (Roberds and Velde 2014 p.19) the Most Serene Republic of Venice definitively established its first public bank, after a process started on December 1584 (Soresina, 1889, p.7): the Banco di Rialto (Bindseil 2019, pp.207-10). Until then the government provided public money by issuing gold, silver and copper coins through its minting activity (Roberds and Velde 2014 p.19).

The Rialto bank was created by the government to correct a market failure: the private sector *per se* was unable to supply an efficient and safe payment service (Roberds and Velde 2014 p.15), given that the Venetian payment system has been characterized by a series of bank failures (Ugolini 2018, p.5). In 1584 It has been calculated that only seven private banks out of one hundred and three were able to avoid bankruptcy procedures (Lattes 1880, p.40, Dunbar 1892, p.312); in such procedures banks were not considered at all as special firms (Lattes 1880, p.47), i.e. activities needing special bankruptcy procedures. Yet a banking supervision body was

established from 1524, having three aristocrats as members (Anonimo 1847, p. 364). Moreover, it is likely that the establishment of a state issuing bank in Venice has also been motivated by the opportunity to have a temporary source for financing public expenditures in extraordinary times, for example during a war (Ghezzi, 1935, p.366-368).

In Venice both investment credit and consumer credit were available (Mueller 1977, p.294), given that traditionally the private bankers permitted a depositor to overdraw her account (Mueller 1977, p.159) while making the sum immediately available for payments via transfers, whose effects were the same as those of modern cheques (Mueller 1977, p.159, 227).

Overdrafts were recognized as legitimate by the state (Mueller 1977, p.214), and deposit transferability was available; for example a loan between two citizens could be based on a bank deposit, given that bankers accepted deposits, letting their depositors settle credit-debt relationships by transferring deposits between each other (Roberds and Velde 2014, p.15). In Venice private credit-debt relationships were also possible, for example through temporary loans, insurance contracts (Tenenti 1953, p.61), or investment in foreign exchange transactions, that were common also among people of modest wealth (Cecchini 2018, p.58). The association between asset holding and credit availability can be further confirmed from the fact that normally the premium between a bank transfer and the coin was positive (Roberds and Velde 2014, p.24) , i.e. the *ducato di banco* (bank ducat) had a superior value than a *ducato d'argento* (silver ducat) (Anonimo 1847, p.365 used the two denominations).

In theory, the Banco di Rialto was supposed to represent a case of quasi-narrow banking, given that it was obliged by law to accept only deposits in coins, and cash was always to remain available at the request of depositors (Anonimo 1847, p.564; Dunbar 1892, p.321), defining tendentially a policy of 100% reserves (Sissoko 2002, p.7 and p.10); transfers had to be made simultaneously between creditors and debtors (Dunbar 1892, p.321, Roberds and Velde 2014 p.20). In practice, however, because the coins into which the Banco's liabilities were formally convertible had been withdrawn from circulation in 1588, bank liabilities were de facto inconvertible into the new circulating coins (Roberds and Velde 2014, pp.21-2; Ugolini 2017, pp.225-6). Coins were the main item in the asset side of the Rialto bank, notwithstanding – to a certain extent - also private commercial debt was allowed (Ugolini 2017, p.44). Moreover the

Rialto bank eventually centralized the clearing mechanism for payments in Venice (Dunbar 1892, p.323, Fratianni and Spinelli 2006, p.271).

In 1593 Banco liabilities became legal tender (Anonimo 1847, p.366, Roberds and Velde 2014, p.21) and its deposits in 1630 represented 80% of the overall volume of exchange settlements in Venice (Sissoko 2002, p.8, Roberds and Velde 2014, p.21). During these years the two legal tenders – coins and bank transfers – were imperfect substitutes, with a premium (“agio”) for payments in transfers relative to those in coins (Dunbar 1892, p.318, Inclimona 1913 p. 149, Fratianni and Spinelli 2006, p.271, Ugolini 2018, p.7), as well as between large and small coins (Sargent and Velde, 1977b, p.23). The conversion rate between the different types of money was determined on the market, and its setting was even more complicated by the fact that Venice adopted a bimetallic monetary standard (Cessi 1937).

The existence of a positive premium between public banking money (scriptural money) and coins (commodity money) was almost a constant in the Venetian experience (Siboni 1892, p. 291, Magatti, 1914, p. 285-289); only sometimes were they at par (Roberds and Velde 2014, p.17). The premium drivers are likely to have been on the one hand the credit availability attached with public bank money (Dunbar 1892, p.330), and on the other hand the quality of the available commodity money (Dunbar 1892, p.331). Moreover, the scriptural money at the time was safer for obvious security reasons (Dunbar 1892, p.309 and p.321). The premium can be considered a relative price between scriptural money and commodity money, associated with the relative quantity/quality of the two monies.

Regarding the Banco’s governance, the bank manager was a public concessionaire (Ugolini 2017 p.36), who was called “Depositario” (escrow agent) (Anonimo 1847, p.364), or “Governatore”¹¹ (governor) (Soresina, 1889, p.8), chosen and paid by the government, given a list of submitted proposals (Roberds and Velde 2014, p.20). The government was the guarantor of the deposits (Pezzolo 2018, p.153); yet the governor was required to post a bond as guarantee and was considered responsible for the full satisfaction of any bank obligation at the end of his mandate – upon request, in cash - (Ugolini 2017, p. 42), under pain of confiscation

¹¹ Some authors used the name “*Depositario*” to define the governor of the Rialto bank (Sandi 1756, Ferro 1778, Anonimo 1847) while others (Soresina 1889, p.5, Luzzatto 1954, p.231) used “*Governatore*”, claiming that “*Depositario*” has been used for the first time later, when the Giro bank was established.

and banishment (Roberds and Velde 2014 p.20). Moreover, all bank officers were required to post a guarantee (Anonimo 1847, p.364).

The venality of offices was in part a device for public funding: the purchaser of the office paid a given amount (the principal) – or made a temporary loan posting a guarantee – while the government paid him a salary (the interest) (Pezzolo 2007, p. 8). The Bank was to be formally liquidated every three years (Dunbar 1892, p.321), in order to reduce the possibility of losses larger than the governor's personal assets, while the private bankers were required to liquidate every six years (Roberds and Velde 2014, p.21). Moreover, the costs of the bank establishment were to be met by public resources – i.e. import taxes (Dunbar 1892, p.312).

Summing up, the Banco di Rialto was a quasi-narrow bank, acting also as a clearing house, and governed through a public concession managed by a hybrid player, being the governor in charge, a mix between a public manager and a private banker.

In May 1619 the government created a new public bank (Soresina 1889 p.9, Siboni 1892, p. 288, Inclimona 1913 p.152, Bindseil 2019, pp.215-7) – the Banco del Giro – with floating (short-term) public debt and coins on the asset side (Roberds and Velde 2014, p.24) and the Giro transfers in the liability side, which represented convertible money up to 1630. In general the Republic issued both floating and funded (long-term) debt, where the role of floating debt was rather limited (Pezzolo 2003, p.61). In general the state's creditors were likely to become floating debt holders, using the transfer mechanism. This mechanism had been first introduced in the 13th century when the Grain Office and Salt Office had started providing transfers for their creditors, and also the Fodder Office used it from 1608 to 1614 (Pezzolo 2003a, p.63, Roberds and Velde 2014, p.24, Ugolini 2018, p.6).

Regarding the respective business roles of the two public banks, while the Rialto bank was a deposit bank, the Giro bank was a device to make the public debt easily transferable, turning it into a means of payment (Roberds and Velde 2014, p.22), and “paying deposits at the call of the depositor, like the existing Banco di Rialto” (Dunbar 1892, p.325), with the possibility of deposit overdrawn (Dunbar 1892, p.325), i.e. to make loans. The account holders were floating debt holders; the Giro bank was allowed to accept deposits of private individuals only from 1643 (Sissoko 2002, p.11).

In this respect the Giro bank can be defined as a state bank of issue (Sissoko 2002, p. 11, Fratianni and Spinelli 2006, p.272). The core of this mechanism lay in the relationships between the Giro Bank and the State Mint, via the role of floating debt holders, that we will describe below. Briefly the Giro bank establishment in 1619 can be considered the final step in a process aimed at increasing the transferability of floating debt transfers, transforming them into means of payment (Sissoko 2002, p.9, Fratianni and Spinelli 2006, p.272).

The functioning of the Giro bank was both innovative and simple (Ugolini 2017, p.43): the government opened accounts to merchants having credits to the Republic and to public officials as well (Soresina 1889 p.16, Inclimona 1913 p.1146), that could be converted into coins upon authorization (Soresina 1889 p.12 and p.16); merchants and public officials became Republic's debt holders. The credit of one accountholder could always be freely transferred on demand to another accountholder (Soresina 1889 p.16), and the corresponding amount would continue to circulate until the final repayment to the last bearer cancelled it out (Ugolini 2017, p. 43). Banknotes were not issued (Siboni, 1892, p.291). The Giro bank liabilities were legal tender for any payment greater than one hundred ducats, while its clearing activity was possible also for payments lower than one hundred ducats (Soresina 1889 p.12). Moreover from July 1627 the account holders could pay import taxes using Giro bank transfers (Soresina 1889 p.20, Siboni, 1892, p.294).

The convertibility promise on Giro bank deposits was based on the fact that in the State Mint an amount of commodity money served as a fund to back the operations of the Giro (Dunbar 1982, p.326), although the backing was not 100%. In fact on June 1619 the Senate authorized on the one hand the creation of 150,000 ducats' worth of coin reserves earmarked at the Mint for the Giro, and on the other hand 500,000 ducats' worth of Giro balances to pay its creditors (Soresina 1889 p.12-13, Roberds and Velde 2014, p.23) - i.e. the holders of the Giro transfers. Moreover, a flow of the Mint commodity money was earmarked to repay Giro scriptural money using coins: the decree of foundation of the Banco actually ordered monthly transfers of 10,000 ducats from the Mint to the Giro for repayments (Roberds and Velde 2014, p.24) up to the limit of 50,000 ducats (Soresina 1889 p.15).

On January 1620 the overall balance and the monthly transfers became respectively 700,000 ducats and 20,000 ducats; the monthly transfers eventually became 80,000 ducats on

August 1625 (Soresina 1889 p.17, Siboni, 1892, p.288, Roberds and Velde 2014, p.24). The Giro balance was further increased on May 1621 – by 100,000 ducats – and on June 1621 – by 40,000 ducats (Soresina 1889 p.18).

Then, “as long as the monthly flow was sufficient to accommodate depositors’ requests, the bank’s liabilities remained convertible (....); the State (....) adjusted the monthly flows of cash from the Mint to service the redemption requests” (Roberds and Velde 2014, p.24).

The Giro bank seems to have had some flexibility in the choice of coins in which to repay (Roberds and Velde 2014, p.24). Progressively convertibility difficulties arose, with delaying payments going hand in hand with further creation of liabilities (Dunbar 1892, p.327). As we already know, authorizations to convert liabilities into coins were suspended in 1630 (Siboni, 1892, p.290, Dunbar 1893 p.211, Inclimona 1913 p.154-155) during the pandemic, eventually transforming the Giro bank into the first example of a purely fiduciary state-issued legal-tender money (Ugolini, 2018, p.7), acting as a clearinghouse for the community (Sissoko 2002, p.10).

The Giro Bank was based on a public - although temporary - commitment: the floating debt had to be extinguished and the accounts closed within three years (Dunbar 1893, p.327); however the deadline was extended from year to year (Ugolini 2017, p. 42). The Giro transfers remained convertible in coins upon authorization until 1666, when full convertibility on demand was established (Roberds and Velde 2014, p. 26; Ugolini 2017, pp. 225-7). Finally, the Republic defined an issuing target: in fact the government came to the conclusion that the Giro balance sheet should not exceed 800,000 ducats (Roberds and Velde 2014, p. 24). Contemporary monetary theory, indeed, included early statements on the need for quantity limitations in money issuing (Sargent and Velde 1977b, p. 51). The Giro balance sheet reached a level of 813,751 ducats level in 1624 (Soresina 1889 p.19, Roberds and Velde 2014, p.24). However in the same balance sheet coins were just worth 80 ducats, indicating that convertibility requests were likely to be limited (Soresina 1889 p.19, Siboni 1892, p.293) or, alternatively, unlikely to be authorized.

In respect to governance, as in the case of the Rialto bank, the officers in the new public bank were concessionaires (Soresina 1889 p.13, Dunbar 1892 p.325, Inclimona 1913 p.152, Roberds and Velde 2014, p. 23); the main officer was called the Depositario, (Soresina 1889 p.8, Dunbar 1892, p.324 and 335), with a three months mandate (Soresina 1889 p.9).

All in all: from 1619 a duopolistic public banking system was born in Venice, where the liabilities of the two banks were treated as equivalent (Dunbar 1892, p.324, Ugolini 2017, p. 44), including the seizure exemption privilege (Soresina 1889 p.8), meaning that in no case did judicial courts have the power to seize their deposits.

Moreover, in their period of coexistence the two public banks were interconnected in some coin exchange operations (Soresina 1889 p.9); while the reciprocal clearing of their liabilities was forbidden, given the need to maintain separation between the two banks (Soresina 1889 p.13). The duopolistic setting ended in 1637, when the Banco di Rialto was shut down (Soresina 1889 p.8, Dunbar 1892, p.324, Roberds and Velde 2014, p. 25, Fratianni and Spinelli 2006 p.271, Ugolini 2017 p.44), with the Banco del Giro remaining the only public Bank in Venice.

Appendix B: Pandemic Recession, Helicopter Money and Political Pressure

What happened in Venice in the period 1629-1631 can be also described using a model, using and modifying the theoretical settings introduced in Masciandaro and Passarelli (2019), Masciandaro (2020) and Favaretto and Masciandaro (2021).

B.1 The Policymaker

The economy consists of a population of inhabitants, and a policymaker that controls both fiscal and monetary policies. In the case of Venice, the Senate represents the incumbent policymaker. Initially we use the standard assumption that the policymaker is a benevolent player (Acemoglou et al. 2020, Argente et al. 2020, Brotherhood et al. 2020, Glover et al. 2020). This assumption will be modified later. All players are rational and share the same information; they maximize their utility in a simultaneous and one-shot way. Moreover, the population size is one, then total and per-capita amounts are the same for all the variables.

Since the population size is one, maximizing the utility of the average representative citizen amounts to maximizing social welfare. Without macroeconomic shocks, fiscal monetization is not needed. In Venice in normal times the Republic produced systematic fiscal surpluses. If a pandemic and/or a famine occurs, the policymaker sets her economic policies to maximize social welfare. Venice was hit by an adverse macroeconomic shock from April 1629 – when a famine started - to September 1631 – when a bubonic plague ended.

A pandemic shock triggers a special recession, because inhabitants' incomes can be hit in an heterogeneous way for three reasons. First, the effects of both the disease and the corresponding public policies are unequally distributed (Glover 2020, Bloom et al. 2021). Second, the less the policymaker is involved in supporting the economy during the pandemic recession through fiscal transfers, the more likely are negative second-round effects on the well-functioning of the economic and financial system after the pandemic (pandemic externalities) (Acharya and Steffen 2020, Anderson et al. 2020, Deb et al. 2020, Bloom et al. 2021). Third, the fiscal policy financing introduces the possibility of monetary stability risks (monetary externalities). Therefore the policymaker will choose its economy policy design maximizing a welfare function with three terms (Masciandaro and Passarelli 2019, Masciandaro 2020):

$$V(\beta, \delta, \tau) = U(\beta, \delta, \tau) - F(\beta) - M(\beta, \delta) \quad (1)$$

Where $U(\beta, \delta, \tau)$, $F(\beta)$ and $M(\beta, \delta)$ are respectively the citizen utility, the pandemic externalities and the monetary externalities, while τ , β , and δ represent the key economy policy variables: taxation, fiscal spending and fiscal monetization. Then the first step is to explore how citizens behave.

A.2 The Inhabitants

We assume that inhabitants are risk neutral, and they maximize their overall utility from consumption and disutility from effort. In our setting inhabitants' utility is associated with heterogeneous resources (Krishnamurthy and Vissing-Jorgensen 2012, Masciandaro and Passarelli 2019, Glover et al. 2020, Gertler 2020, Masciandaro 2020, Reis 2020), and these sources are combined to consume a single final good (Masciandaro and Passarelli 2019, Glover et al. 2020).

Inhabitants expect that when a pandemic occurs their incomes can be hit. Containment measures save lives, but in parallel impose limitations on several economic activities. People suffer because lockdown measures and quarantines reduce their incomes and expenditures (Baker et al. 2020a, Carvalho et al. 2020, Cox et al. 2020). At the same time, inhabitants expect that the policymaker will help those of them who are suffering with an injection of a lump-sum fiscal transfer to mitigate the pandemic costs (Acemoglu et al. 2020, Argente et al. 2020, Brotherhood et al. 2020, Glover et al. 2020).

As much as citizen losses due to the pandemic can be heterogeneous, the same will be true for the distribution of the fiscal transfers (Bayer et al. 2020, Glover et al. 2020). The pandemic shock and the consequent fiscal transfer policy influence citizen welfare in an unequal way, producing a special case of income heterogeneity (Auerbach et al. 2020, Bayer et al. 2020, Gertler et al. 2020, Glover et al. 2020, Kaplan et al. 2020).

Given the risk that an activity is frozen during a pandemic due to the containment policies – pandemic or “quarantine shock” (Bayer et al. 2020) - we can distinguish between safe activities and risky activities. Occupations that do not suffer losses during a pandemic produce

safe incomes, while risky earnings are associated with activities that are negatively influenced when a pandemic happens (De Vito and Gomez 2020, Elenev et al. 2020). Safe incomes can be taxed. As extreme examples of the two situations during the 1630 pandemic, consider the case of the second-hand clothiers as inhabitants involved in risky activities, being systematically hit by blockades and closures, were the Arsenal workers were individuals with a safe occupation, having their salaries in any case, due to the Senate subsidies.

Therefore the representative inhabitant's utility is:

$$l(1 - \tau) - U(l) + \theta(r) \quad (2)$$

Assuming a normalized productivity to one, the first term is the after-tax income, while the second term is a standard increasing and convex effort function. Given taxation, the inhabitant chooses her optimal effort. The optimal condition yields citizen labour supply, decreasing in the taxation, and this rate represents her elasticity to tax distortion. Since both population size and productivity are equal to one, the labour supply represents the total safe income.

The third term represents the risky earning utility. There is only one risky activity, and it is measured using the variable r , which parameterizes the risk that the inhabitants bear. The return of the risky activity is $\theta(r)$, with $\theta'(r) > 0$ and $\theta''(r) < 0$. We normalize this return to one. If a pandemic occurs, with probability p , lockdown and quarantine are implemented. The citizens know that the value of the risky activity will fall – for simplicity to zero – and they will bear the full cost. At the same time, the citizens expect that the policymaker will design a fiscal transfer policy to address their losses, in a proportion β of such losses, and with a corresponding monetization δ .

Safe incomes and risky earnings finance consumption. The overall budget constraint of the representative average inhabitant will be:

$$c = l(\beta, \delta, \tau) + \theta(\beta, \delta) \quad (3)$$

With risky earnings being the only source of heterogeneity among inhabitants, such a metric allows us to highlight in the clearest and simplest way the redistributive effects of the fiscal transfer and its monetary financing. Given that the economic policy design influences the inhabitants' welfare, now we turn again our attention to the policymaker choices.

B.3 The Economic Policy Design

When a pandemic breaks out, the policymaker designs a containment policy, facing an unpleasant dilemma between two public goals (Baldwin and Weder di Mauro 2020). The policymaker needs to protect public health by implementing a containment policy with the aim of minimizing the expected loss of life. In parallel, containment policies saves lives, but, given the interactions between economic decisions and epidemics (Eichenbaum et al. 2020), any containment policy has short-term economic and financial costs (Deb et al. 2020, Ludvigson et al. 2020). These costs simultaneously affect aggregate supply (Del Rio-Chanona et al. 2020, Koren and Peto 2020) and aggregate demand (Andersen et al. 2020, Del Rio-Chanona et al. 2020).

The policymaker can address the pandemic recession by implementing an extraordinary fiscal transfer policy using a lump-sum distribution (Bloom et al. 2021, Glover et al. 2020), with the aim of mitigating the negative effects of containment measures (Beck 2020, Bénassy-Quéré et al. 2020, Brunnermeier et al. 2020, Deb et al. 2020, Drechsel and Kalemli-Ozcan 2020, Gros 2020a, Kahn and Wagner 2020, Segura and Villacorta 2020). The fiscal transfer can come in many forms, as income subsidies, work insurance, equity injections, loan guarantees (Cèspedes et al. 2020, Didier et al. 2020, Elenev et al. 2020). Transfer payments can be unconditional (Kubota et al. 2020) and/or conditional on the citizen's status (unemployed and/or liquidity or credit constrained individuals) (Bayer et al. 2020). In Venice the Senate systematically implemented fiscal transfer policies during the pandemic recessions. Then two questions arise.

First, how large should this fiscal transfer policy be? Two opposite options arise. At one extreme, the policymaker is completely absent, and citizens suffered income losses. At the other extreme, the fiscal expansion helps the suffering citizens. The policymaker injects resources in the economy, and the metric of this fiscal action is a proportion, $\beta \in (0,1)$ of the citizen's losses, which is the policy variable that parameterizes fiscal policy.

Second, how can such a fiscal policy be financed? The policymaker can raise taxation (Bloom et al. 2021, Eichenbaum et al. 2020), issue debt or money. The policymaker defines the optimal fiscal transfer policy, β^* , and this policy can be financed by issuing new debt, charging

a regressive lump-sum tax τ on the safe income for servicing the issued debt, and through monetization. Assuming no default risk, the policymaker budget constraint is:

$$\beta\theta(1 + i(1 - \delta)) = \tau l \quad (4)$$

where τ is the lump-sum tax, l is the safe income of the inhabitants before taxes, i is the interest paid on the public bond and δ is the fiscal monetization where $\delta \in [0,1]$. For any unit of debt issued, the policymaker repays $1 + i(1 - \delta)$. The cost of debt, $i(1 - \delta)$, is negatively associated with the degree of fiscal monetization. When a higher monetization is implemented (i.e. higher δ), a lower portion of funded debt will be sold to inhabitants.

Therefore fiscal transfer and its monetization influence inhabitants' consumption. But the pandemic policy can produce long standing effects on inhabitants' welfare. So we introduce the possibility of monetary and pandemic externalities, internalizing future negative spillovers due to the economic policy action that can affect the economy when the pandemic ends.

First, fiscal monetization is not a free lunch: it may create monetary externalities. Monetary externalities can depend on the association between central bank seigniorage and monetary stability risks. The more traditional channel is the relationship between seigniorage and inflation tax (Buiter 2007), that increases both national inflation (Friedman 1969, Aizenman 1992) and, via exchange rate devaluation, international inflation (Hamada 1976). Moreover, monetary externalities can also include banking (Bianchi, 2010) and financial (Stein 2012, Cesa Bianchi and Rebucci 2017) imbalances, or more generally it is a device to take into account the risk of monetary policy multiple equilibria and their costs (Gliksberg 2009, Airaudo and Bossi 2017).

Fiscal monetization threatens the monetary stability goal in the post pandemic period, as it has been the case during the 1630 pandemic recession. The costs of monetary instability, $M = M(\beta, \delta)$, are quadratic in the degree of monetary accommodation δ :

$$\frac{\Phi}{2} \delta^2 \beta \theta \equiv M(\beta, \delta) \quad (5)$$

The monetary externality aversion – i.e. the parameter Φ - is homogenous among citizens. With this assumption it will be evident that it is sufficient to have just two sources of

heterogeneity among citizens – fiscal transfer and its bond financing – to have a multiple equilibria setting in terms of political consensus. With further heterogeneity sources the results should be even stronger.

Second, the less the policymaker is involved in supporting the economy, the more likely are negative second-round effects on the well-functioning of the economic and financial system after the pandemic (Acharya and Steffen 2020, Anderson et al. 2020, Deb et al. 2020). The absence of active public policies can have adverse economic effects that spread out over time and into the longer term, as a reduction in return to human capital or negative structural changes in terms of trading patterns and stalling development (Bloom et al. 2021). On this respect, and notwithstanding the public action, the 1630 pandemic recession was a crucial negative turning point in the history of the Most Serene Republic.

To capture in the simplest way this channel, let the pandemic externality function be:

$$\frac{\varepsilon}{2} [(1 - \beta)\theta]^2 \equiv F(\beta) \quad (6)$$

The pandemic externalities are increasing and convex in the amount of losses, and they are lower the higher are the fiscal transfers, β . Also the pandemic externality aversion – the parameter ε – is homogenous among inhabitants, for the same motivations above expressed.

B.4 The Optimal Helicopter Money

Inhabitants and policymaker simultaneously optimize their choices. The average representative citizen, optimizing the goal function (2), and given her elasticity to tax distortion, η , identifies the optimal effort, l^* and the optimal risk assumption, ϑ^* . The corresponding safe incomes and risky earnings finance consumption. This assumption is particularly relevant during a pandemic: shutdowns and quarantines lockdowns produce material deprivation and households can draw on all their net available resources to address the shock (Baker et al. 2020a, Carvalho et al. 2020, Cox et al. 2020). Moreover the available resources depend on the design of taxation, fiscal transfer and income from bond financing. Equation (3) becomes:

$$c = l^*(1 - \tau(\beta, \delta)) + \beta\vartheta^*(1 + i(1 - \delta)) \equiv C(\beta, \delta) \quad (3')$$

The policymaker maximizes the social-welfare function (1), setting her strategy on taxation, τ , fiscal transfer, β^* , and fiscal monetization policy, δ^* . Being a social planner in action, fiscal and monetary policy are optimally coordinated (among others, from Abel 1987 to Bianchi et al. 2020), including the degree of fiscal monetization (among others, Chari and Kehoe 1999, Punzo and Rossi 2019). Regarding the institutional setting, we have here a fiscal dominance regime (Sargent and Wallace 1981): monetary policy is not independent. Focusing on the optimal level of fiscal monetization, δ^* , its social optimal value is:

$$\delta^* = \frac{\eta}{1-\eta} \frac{i}{\phi}. \quad (7)$$

The optimal level of monetization, δ^* , will increase: a) the more taxation is distortionary; b) the more the cost of debt servicing is high; c) the more monetary externality aversion is low.

Given the decision in terms of fiscal monetization, the final step is its implementation. Here a central bank - or a state bank issuer, the Venice Giro Bank, in the case of Venice – comes in as a public institution with its goal, which comes from somewhere or someone (Reis 2013) – the Venice Senate. The central bank, taking into account its resource constraint, ξ , technically implements the policy choice, using case by case the more effective tool (Castillo Martinez and Reis 2021). Focusing on helicopter money policies, two options are available (Galí 2020a, Benigno and Nisticò 2020): changes in central bank liabilities (soft helicopter money) and/or changes in the central bank net-worth (hard helicopter money). The overall macroeconomic effects of these policies are disputed (Bernanke 2003 and 2016, Woodford 2012, Turner 2013, Perotti 2014, Muellbauer 2014, Borio et al. 2016, Di Giorgio and Traficante 2018, Bartsh et al. 2019, Galí 2020a, Benigno and Nisticò 2020, Bartsh et al. 2020). For our purposes it is sufficient to assume that the central bank defines its optimal helicopter money action, discounting its effects on monetary externalities:

$$\xi = f(\delta^*) \quad (8)$$

B.5 Political Pressure and Helicopter Money

Now, we can see what happens if the policymaker is not the benevolent policymaker. If politicians are in charge and at the same time inhabitants are heterogenous, different

monetization policies have associated redistributive effects, and at the same time such policies can have political effects if the political consensus depends on inhabitants' economic preferences (Masciandaro and Passarelli 2019, Masciandaro 2020, Favaretto and Masciandaro 2021).

The net transfers implied by socially optimal policies can be positive for some and negative for others. Moreover, if a policy task has distributional effects, politicians would like to control those effects (Alesina and Tabellini 2007): the redistributive effects are relevant as long as the politicians care about the inhabitants' preferences. For example, one way to build consensus in favour of containment policies is to use fiscal retributive policies to reduce the costs to those whose resources are threatened by shutdowns and quarantines (Glover 2020). Therefore, we need to explore the inhabitants' preferences regarding the policy mix designed by the policymaker. Two different dimensions are relevant: inhabitants can be or not subsidy recipient individuals, and/or they can be or not monetization prone agents.

Which are the subsidized inhabitants? Let us consider any inhabitant j , being $\theta + \theta^j$ the amount of risky earnings in her balance sheet. With $\theta^j > 0$ inhabitant j will be a subsidized inhabitant relative to the average inhabitant (subsidization gain). Let $L(\theta^j)$ be the distribution of the subsidized citizens across the population. With risky earnings being a proxy for the fiscal transfer, these resources in the balance sheet of the median inhabitant tell us whether the subsidized inhabitants represent the majority or a minority of the population.

What about monetization propension? Inhabitants can be heterogeneous also as funded debt holders. In this case, the more a inhabitant j is a debt holder, the more she will be monetization adverse, given that more monetization implies lower interest rates. Let $(\beta + b^j)(1 - \delta)\theta$ be the amount of bonds in inhabitant j 's balance sheet. With $b^j < 0$ inhabitant j will be a monetization prone individual relative to the average inhabitant (monetization gain). The bond holding of the median inhabitant signals whether the monetization prone inhabitants represent the majority or a minority of the population. Therefore, given the general individual utility function (1) and the above definitions of θ^j and b^j , the inhabitant j 's utility $V^j(\beta, \delta)$ is:

$$V^j(\beta, \delta) = V(\beta, \delta) + \beta \theta^j + b^j \theta i (1 - \delta) \quad (9)$$

where the last two terms on the right-hand side account for the two forms of heterogeneity of individual j relative to the average inhabitant. Each inhabitant's preferences can differ from those of the benevolent policymaker because of these two terms. Focusing on monetization preferences, the optimal fiscal monetization for inhabitant j is:

$$V_{\delta}^j = V_{\delta} - b^j \theta i \leq 0 \quad (10)$$

Assuming equation (10) holds as an equality, solving it yields:

$$\delta^j = \left(\frac{\eta}{1-\eta} - \frac{b^j}{\beta} \right) \frac{i}{\phi}. \quad (11)$$

By comparing equation (7) with the social optimal monetization (11), it is evident that, given a fiscal policy $\beta \neq 0$, a political distortion can arise between a inhabitant's preferred policy and the social optimal monetization:

$$\delta^j - \delta^* = - \frac{b^j}{\beta} \frac{i}{\phi} \quad (12)$$

The political distortion $\left| \delta^j - \delta^* \right|$ will reflect inhabitants' preferences. The direction of the political pressure depends on who the median inhabitant is. For example, we can assume that financial asset/wealth holdings are very skewed, concentrated among a small segment, the rich, of the population. Therefore monetary policy, influencing asset returns, produces redistributive effects that benefit the holders of such as assets (Krishnamurthy and Vissing-Jorgensen 2011, Brunneimeier and Sannikov 2014): lower monetization is associated with higher interest rates, that bond holders appreciate.

We interpreted the monetary stance in Venice in early modern times as an extraordinary "hard helicopter money" with redistributive effects. Then a question arises: which inhabitants like fiscal monetization? Among all the possible equilibria, all Venetian subsidized inhabitants like helicopter money, except when they were monetization adverse individuals. In parallel, all monetization prone inhabitants like helicopter money, except when they are not

subsidized inhabitants. In other words, uncertainty is present in cases without a clear-cut net benefit, as subsidized merchants that are also bond holders.

But how relevant are the median inhabitant's preferences for the incumbent policymaker? Taking inspiration from Passarelli and Tabellini (2017) and Favaretto and Masciandaro (2021), we assume that the monetary policy decisions are associated with political consensus, because consensus depends on the median inhabitant's preferences through economic and psychological pressures. The risks of political unrest can influence incumbent policymakers, and these risks can be motivated by facts and emotions. If the policymaker considers the median inhabitant's preferences as a relevant proxy for riot risks, political pressures may be relevant in shaping fiscal monetization choices. The link between inhabitants' preferences, political pressure and political choices can emerge also in an oligarchy of merchants, as the Venice Republic was at that time. In fact, ordinary Venetians used collective actions to influence patrician choices, especially during crisis periods.

This situation is captured in the simplest way assuming that the actual monetary policy decision δ_A is such that:

$$\delta_A = \chi \left| \delta^j - \delta^* \right| \quad (13)$$

where $0 < \chi < 1$ represents the relevance of the political pressure. In Venice, the 1630 extraordinary monetization over-expansion created inflation and currency depreciation. In parallel, the population expected "whatever it takes" myopic fiscal policies, and the politicians tended to please inhabitants' preferences, given the threat of riots. Political pressure and helicopter money were likely to be two sides of the same coin.

B.6 Further Steps

The analysis can be enriched in several directions:

a) Monetary externality sensibility and inhabitants' heterogeneity: monetary instability is assumed to be an homogeneous social cost. But inhabitants can be heterogeneous in their ability to address such risks through hedging, with some individuals facing – or feeling that they face – higher costs due to monetary instability (i.e. *inflation-adverse* citizens). In other words, we could explicitly take into account the redistributive effect of inflation, that have long been

recognized in the traditional literature (Keynes 1923, Bresciani-Turroni 1937, Friedman and Schwartz 1963), and that has been discussed again recently (Doepke and Schneider 2006, Colbion et al. 2012). Also in early modern Venice the ruling elites constantly demanded a stable currency (Al-Bawwab 2021). Allowing for this kind of heterogeneity would lead to a straightforward prediction: the smaller the mass of inflation risk-adverse citizens, the stronger the political pressure to engage in fiscal monetization.

Moreover, we could introduce heterogeneity in the propensity to consume, that can influence the effect of the fiscal transfer in stimulating consumption (Andreolli and Surico 2021). This change could help to explain the empirical estimates of the marginal consumption propensity during a pandemic (Baker et al. 2020b, Chetty et al. 2020, Coibion et al. 2020, Karger and Rajan 2020, Kim and Lee 2020, Kubota et al. 2020). Finally, we can assume heterogeneity in inhabitants' marginal propensity to take risk (Kekre and Lenel 2021), and also this heterogeneity can influence the distribution of the fiscal transfer effect.

b) Taxation and inhabitants' heterogeneity: safe income taxation has been assumed to be the same for all individuals. In the presence of taxation heterogeneity, the distributional effects are likely to increase. For example, given the decisions regarding the fiscal policy and its monetization, if richer inhabitants are likely to have higher tax burden, all else equal, they would prefer lighter fiscal policies. The income and/or taxation heterogeneity can be relevant in strengthening or weakening political pressure in favour or against the fiscal monetization.

c) Public debt and interest rates: public debt is only issued to address the pandemic-related recession and the interest-rate level remained constant. Assuming an initial debt, or interest rate endogeneity depending on the debt stock, would exacerbate the policy trade-offs and, consequently, the relevance of the political distortions.