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How Pandemic Shock Affects Claim for Minimum Income Measures

Andrea Barigazzi, Giovanni Gallo

Dipartimento di Economia Marco Biagi
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How Pandemic Shock Affects Claim for Minimum Income Measures^{*}

Andrea Barigazzi^a, Giovanni Gallo^{a,b}

^a *University of Modena and Reggio Emilia, Modena, Italy*

^b *Center for the Analysis of Public Policies, Modena, Italy*

Abstract

Social transfers, and minimum income schemes in particular, are key tools to support people's income and protect their living standards, especially in times of crisis. This paper aims to understand how the claiming of social benefits changed in response to the biggest crisis of recent years, i.e. the pandemic shock. In particular, we test whether the pandemic has reduced the transaction costs associated with claiming social transfers, increasing their spread across the population even controlling for recent recessive trends. We focus on Italy as an interesting case study, because it was the first Western country to be strongly affected by the Covid-19 pandemic and the latest EU country introducing a national minimum income scheme (the *Reddito di Cittadinanza* or RDC). Based on a rich dataset of statistics at NUTS-3 regional level, results show a significant and positive correlation between the spread of RDC recipients and the one of Covid-19 contagions, especially during the first stage of pandemic. This evidence confirms that lockdown measures strongly affected the economic wellbeing of households and, in turn, transaction costs associated with the RDC claim. Main results hold when relevant demographic and socioeconomic variables directly influencing the RDC claim are considered.

Keywords: Minimum income schemes; transaction costs; Covid-19; social transfers; NUTS-3 regions.

JEL codes: I18; I31; I38.

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1. Introduction

Social transfers, and minimum income schemes in particular, are key tools to support people's income and protect their living standards. However, the incisiveness of such policies may be undermined if eligible recipients do not claim the benefits they are entitled to. Several studies have provided evidence of non-take-up of social policies in developed countries (Hernanz et al., 2004; Campbell et al., 2005; Figlio et al., 2015; Eurofond, 2015). The reasons behind insufficiently high take-up rates are multiple and they can be enclosed in the assumption that the expected benefits are too low compared to the transaction costs of claiming social assistance (Riphahn, 2001). In the literature, bureaucratic and administrative barriers are generally cited among the determinants that significantly affect the reduction in social policies take-up (Van Oorschot, 1991; Scott and Pandey, 2000; Hernanz et al., 2004; Frazier and Marlier, 2016; Daigneault and Macé, 2020). Similarly, the expected amount and duration of benefits are major factors related to social policies take-up (Bruckmeier and Wiemers, 2012; Arrighi et al., 2015). Other works also correlate non-take-up with information and awareness among potentially eligible individuals (Matsaganis et al., 2010; Mazet, 2014; Bhargava and Manoli, 2015). Not least, social stigma is indicated as an important factor leading to increased rates of non-take-up (Moffitt, 1983; Kayser et al, 2000; Hancock et al., 2004; Walker et al, 2013; Baumberg, 2016; Chambers et al., 2016).

Social transfers and minimum income schemes assume additional value during times of crisis. In fact, shocks can jeopardize the economic well-being of households, leading to economic instability, reduced purchasing power, increased uncertainty, poverty, and unemployment rate. The claim for social support is consequently expected to increase in the aftermath of a shock, independently from its kind. Several scholars have related these two aspects, studying the impact on the demand for social benefits caused by different shocks such as wars, economic crises, natural events, sudden changes in the market or health crises.

Instability resulting from shocks may lead in parallel to a reduction in transaction costs associated with the claim for social transfers. A lower non-take-up rate may depend on a reduction in stigma, following the assumption that it is socially more acceptable to apply for welfare assistance when a larger percentage of the population is in economic hardship (Gustafsson, 1984; Gustafsson, 2002). At the same time, the expectation of receiving larger amounts of social assistance and for longer periods during crisis may lead to greater propensity to claim for social policies. Administrative procedures could also be simplified during times of economic uncertainty, as well as bureaucratic constraints could be alleviated in turn.

This paper aims to understand how the claiming of social benefits changed in response to the pandemic shock, even when controlling for its recessive impact across the national territory. In particular, we want to test whether the pandemic has reduced the transaction costs associated with claiming behaviors, consequently increasing the spread of social transfers across the population. To do this, we focus on Italy as an interesting case study because it was the first non-Asian country to face the rapid and widespread spread of Covid-19, the first Western country to introduce heavy restrictions on mobility and personal freedom, and the first EU country to close all activities not considered as essential (Capano, 2020; Remuzzi and Remuzzi, 2020). Moreover, Italy was the latest EU country which introduced a national minimum income scheme, i.e. the so called *Reddito di Cittadinanza* or RDC (Raitano et al., 2021). Thanks to its benefit generosity, it nowadays represents the main public policy contrasting poverty and social exclusion in Italy. For this reason, among the different cash social transfers existing in the Italian welfare system, we decide to focus on RDC in this analysis.

This study explores how the RDC claiming changed during the different stages of pandemic in Italy from February 2020 to December 2021, as well as across the country. The latter aspect appears of great interest in the proposed analysis, because the spread of Covid-19 in Italy has been quite heterogeneous at territorial level. Based on the estimate of linear panel-data models, the econometric analysis relies on monthly data aggregated at NUTS-3 level on the RDC receipt (e.g. number of recipient households, average benefit amount) and the Covid-19 pandemic spread (e.g. number of contagious, deaths due to the coronavirus).

For the best of our knowledge, the contribution of the paper to the economic literature on the topic is twofold. First, recent literature analyzed the state fiscal response to the pandemic shock (among others see Baptista et al., 2021), but still neglects how the claiming of social benefits has changed because of it. To do that, as the pandemic is undoubtedly a regional crisis spatially uneven in its impacts (Bailey et al., 2020; Bailey et al., 2021; Bonacini et al., 2021),² we adopt a sub-regional perspective.³ This is particularly important in Italy, where the healthcare management is regulated on a regional basis (Mauro and Giancotti, 2021; Costa-Font and Turati, 2018).

² According to the recent literature, it is probably due to a multiplicity of factors: the intrinsic unpredictability of Covid-19; the diversity of infrastructures (especially healthcare) which vary between regions; the different global connection of some territories compared to others (Bourdin et al., 2021; Rodríguez-Pose & Burlina, 2021); and to the urban structure (Connolly et al., 2021).

³ Additionally, spatial differences also affect when studying the distribution of social spending. Hamnet (2009) reveals that welfare benefits are concentrated in regions with specific employment history and low-income households. McVicar (2006) notes a regional pattern in the UK where disability benefits are more prevalent in the North than the South, similar to the USA's North/South divide, where Southern States have disproportionately high disability benefit enrollment.

Second, we further explore the heterogeneity existing in the national territory also considering relevant socio-economic and demographic characteristics of the population at NUTS-3 regional level. These factors may indeed affect the claiming of social benefits, with some social groups more inclined to claim and others instead more reluctant to do the same (Sohrab, 1994; Currie and Grogger, 2002; Grogger and Michalopoulos, 2003). These discrepancies across the population may have several reasons, such as language difficulties, stigma, inadequate information, low program awareness, or greater tendency to procrastinate (Bertrand et al., 2006; Lamont et al., 2014; Frazier and Marlier, 2016; Bruckmeier and Wiemers, 2017; Daigneault and Macé, 2020).

What we assume in this analysis is that the economic need engendered by negative effects of the pandemic on the labour market is likely to have reduced the perceived stigma related to the RDC claim. At the same time, we expect that the suspension of the measure conditionality (i.e. the mandatory active research of an occupation) and interviews with both social services and employment centers has decreased also the fear of controls among households. As a consequence of these two elements, transaction costs related to the RDC claim significantly – even if temporarily – reduced in the times of pandemic, leading a greater number of households in economic difficulties to apply for the social benefit.

The rest of the paper is organized as follows. Section 2 reports a brief literature review on the impact of different shocks on the claim for social transfers. Section 3 describes the datasets used and the Italian framework on the evolution of pandemic and the RDC receipt. Section 4 and 5 present the econometric method and results. The last section concludes and discusses policy implications rising from this study.

2. Literature review

As mentioned, social transfers and minimum income schemes take on additional value in times of crisis. In Argentina, after the outbreak of the 2001 severe economic crisis, the government introduced the *Plan Jefes*, thus an income support measure for all households with workers who had lost their main source of income (Galasso and Ravallion, 2004).

Between 2007 and 2009, the US public spending increased by 14.2% due to the Great Recession. Three quarters of the increase was due to the increase in cash transfers, of which three quarters in turn were social transfers (Oh and Reis, 2012). Looking across a sample of 22 OECD and European countries, the US does not however stand out in this regard. In every country except Hungary, the

public spending increased well above their trend in the past decade, and that increase was driven by social transfers (Oh and Reis, 2012). Among the cash social transfers, the minimum income schemes had an important role to alleviate the negative effects of the Great Recession, because they specifically focus on the households in severe economic need. For this reason, despite the adverse conditions related to the crisis and the severe budget austerity, the Spanish government strongly defended this measure (established just before 2008) during the recession. Similarly, Greece and Italy, the only two EU countries without a national minimum income scheme in 2016, decided to introduce this measure in their welfare systems as a response to the recession effects in 2017 and 2018 respectively (Ziomas et al., 2017; Jessoula and Natili, 2020).

Shocks can also be caused by changes in the local labor market. Autor et al. (2013) analyze the effect of rising Chinese import competition between 1990 and 2007 on local U.S. labor markets. Import shocks triggered a decline in both employment and wage levels and these changes contributed to rising transfer payments through multiple federal and state measures. Deryugina (2013) studies hurricanes as an exogenous shock in the US local economies and shows that non-disaster government transfers increase dramatically in the decade following the climate event.

Health shocks are among the most complex crises to deal with, and the Covid-19 pandemic is certainly the most impactful shock of this kind in recent years. As an example of the severity of the effects of the pandemic on national economies and labor markets, Gallo and Raitano (2023) highlight the sudden deterioration of the Italian macroeconomic situation after the arrival of Covid-19. As an example, in a very few months the total hours authorized to companies as short time work allowance from March to August 2020 amounted to 2.8 billion, while, for comparison, they were approximately 1.2 billion in 2010, the hardest year for the Italian economy during the crisis started in 2009. As a result, the pandemic also elicited an inevitably and immediate response from policymakers, who supported household incomes introducing emergency benefits or improving the existing measures (OECD, 2020; Anderson et al., 2020; Gentilini et al., 2021), temporarily putting aside the usual concerns about the trade-off between generosity of social transfers and fiscal sustainability.

3. Data and the Italian framework

The analysis relies on a dataset merging, for each of the 107 Italian provinces (i.e. NUTS-3 level), aggregated statistics on the spread of Covid-19 contagions and the RDC receipt. The first ones are

provided by the Italian Civil Protection Department⁴ and contains information on the daily trend of positive cases and deaths from the 24th of February 2020 onwards. The second archive of aggregated statistics, named ‘*Osservatorio sul Reddito e Pensione di Cittadinanza*’, is instead provided by the Italian National Social Security Institute (INPS) and collects several information on RDC since August 2019,⁵ providing at provincial level the monthly trend of the number of households being RDC recipients and the benefit amount received on average by the same. Once merged the two datasets, as we are mainly interested on how the RDC claiming changed during the pandemic, our final sample of provincial-level observations only focuses on the period from January 2020 to December 2021.

Socio-economic and demographic characteristics of the provincial population differ across the national territory. These factors are expected to claim and take-up for means-tested social benefits. This is especially true when dealing with a country like Italy, which is marked by strong heterogeneity among provinces in terms of demographic and economic characteristics (see, among others Gallo and Pagliacci, 2020). To further explore this heterogeneity in our analysis, the final dataset is enriched by a number of provincial-level statistics on relevant demographic and socio-economic characteristics of local populations. A more detailed description of variables used can be found in Appendix (Table A1).

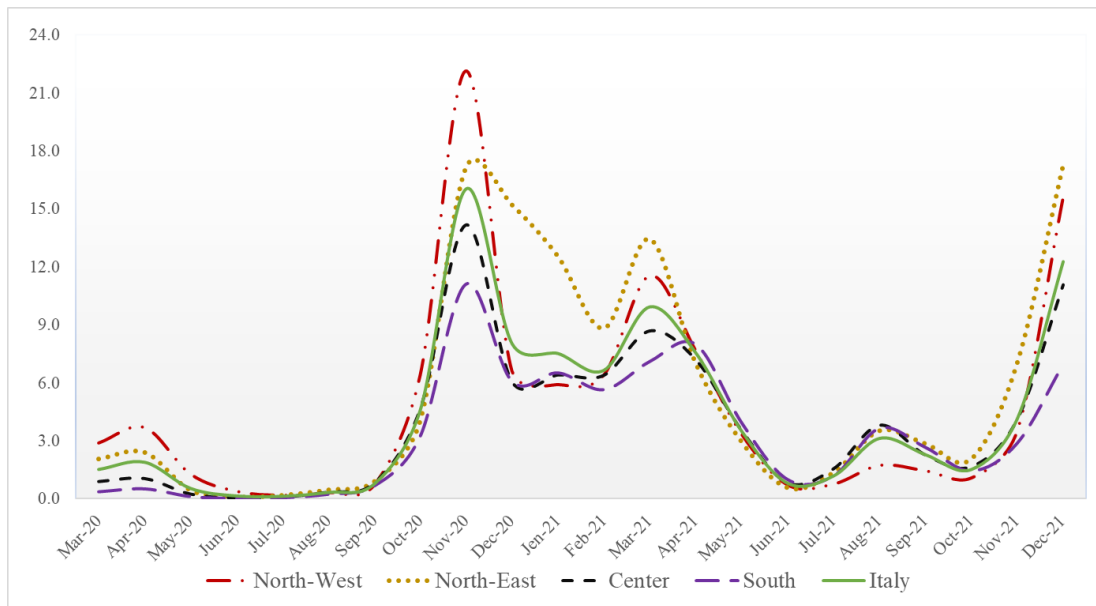
3.1. *The evolution of pandemic in Italy*

Figure 1 shows the trend of Covid-19 contagions in Italy, by macro-region (i.e. north-west, north-east, center, and south) and as a whole, between March 2020 and December 2021. As we observed different phases of coronavirus spread (and different national and local government strategies in terms of contact tracing and restrictive measures), to provide a more truthful measure of the impact of pandemic shock on local population, Figure 2 also shows the trend of deaths due to Covid-19 during the same reference period.

⁴ Civil Protection Department. Repository of Covid-19 outbreak data for Italy. <https://github.com/pcm-dpc/Covid-19>. Accessed on February 11, 2022.

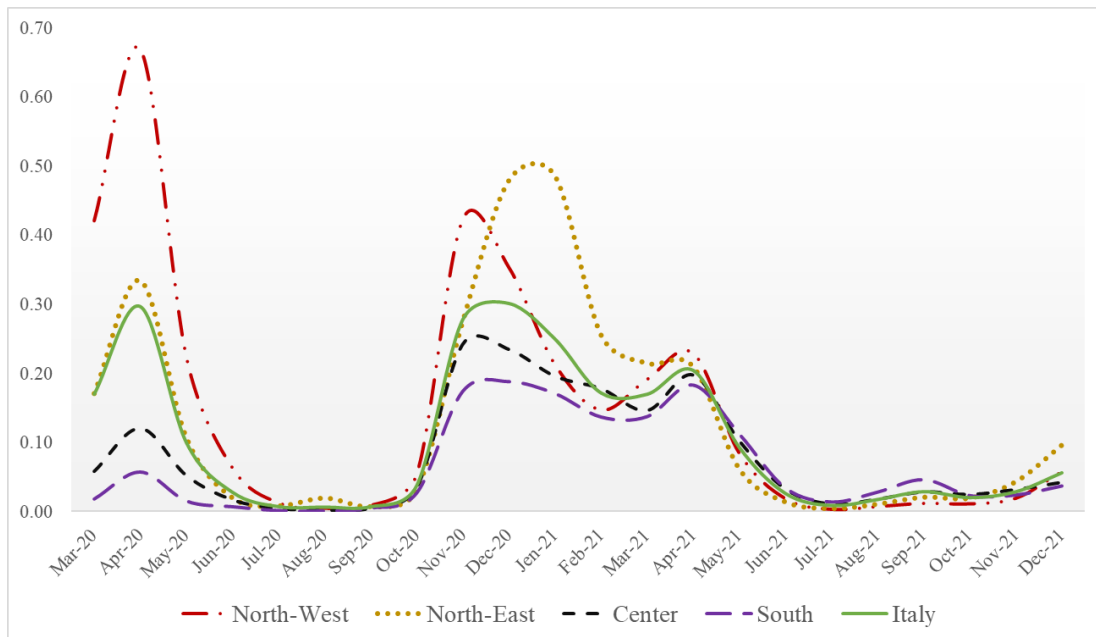
⁵ Although the RDC have been introduced in March 2019 (first cash payments since April 2019), the INPS provides aggregated statistics on this measure since August 2019.

Figure 1. Trend of Covid-19 cases per 1,000 inhabitants between March 2020 and December 2021



Notes: The number of cases reported is the one collected on the 28th day of the month. Source: Elaborations of the authors on Civil Protection Department data (2021).

Figure 2. Trend of deaths due to Covid-19 per 1,000 inhabitants between March 2020 and December 2021



Notes: The number of deaths reported is the one collected on the 28th day of the month. Source: Elaborations of the authors on Civil Protection Department data (2021).

The first period, which includes roughly the months from March to October 2020, was initially characterized by a dramatic and unexpected influx of deaths. The sum of infections, on the other hand, when compared to the subsequent waves, seems significantly lower. This is due to the poor testing capacity, the limited availability of swabs, and the inevitable unpreparedness the local

authorities faced in the early stage of the pandemic outbreak. Statistics on Covid-related deaths then return the real magnitude of the first wave of contagious. The seriousness of the situation is also confirmed by the actions taken to counter the virus spread (e.g. closure of schools and universities, ban of unnecessary travels, closure of non-essential activities).⁶ These measures remained active until May 3, 2020.

The second part of this first period, which can be defined as “living with the virus”, reported the gradual relaxation of restrictive measures. The situation remained stable until the beginning of November 2020, when the second wave of Covid contagious forced the Italian government to new restrictions. This period, which lasted until late spring 2021, can be considered as the second phase of pandemic. Figures 1 and 2 clearly show the exponential increase in cases and deaths since November 2020. The difference in the number of positive cases compared to the first wave is due, as mentioned, to the different tracing capacity and strategy, but also to the advent of new, more contagious variants of Covid-19. Another difference with the first wave of contagious regards the kind of restrictive measures adopted. In fact, during this phase of virus expansion, instead of introducing the same measures in the whole national territory, the Italian government established a containment system where the tightening of restrictive measures was based on a set of indicators at regional level.⁷ For this reason, the freeze on economic activities was in this phase more moderate than in the first one. From summer 2021 onwards, also thanks to the advent of Covid-19 vaccines and the massive vaccination of the Italian population, a stabilization of the situation and a gradual return to normality were outlined despite the arising of new Covid-19 variants.

The pandemic is undoubtedly a regional crisis, spatially uneven in its impacts. The North-West is the most affected area in the first phase of virus spread, followed by the North-East. Other areas are instead less affected, particularly the South. This is particularly clear when controlling for the number of deaths. In this case, North-West values are double compared to those in the North-East, six times higher than the Center ones, and ten times higher than the South ones. In contrast, the second wave affects the Italian macro-regions more evenly, despite the virus spread is still slightly greater in the North of Italy.

⁶ To better understand the impact of the first wave on national economic wellbeing, Figure A1 presents the time trend of the quarterly GDP amount between 2019 and 2021. The first and second quarters of 2020 mark a contraction of 6.4 percent and 18.5 percent from the same quarters of the previous year. While at the end of 2021, GDP returns to the levels of the end of 2019, before the pandemic outbreak.

⁷ This containment system at regional level distinguished white, yellow, orange and red zones according to the seriousness of the pandemic.

A deepening on the trend of Covid-19 at provincial level highlight the importance of studying the subregional heterogeneity. Looking at the first wave of Covid-19 cases, for instance, a subsample of the most affected Italian provinces at that stage (i.e. Lodi, Mantua, Reggio Emilia, Piacenza, Verona, and Turin) report remarkable disparities (Figure A2). The provinces of Lodi and Piacenza show similar trends in positive cases to each other despite belonging to different NUTS-1 regions (North-West and North-East respectively). Some differences between provinces also arise in terms of decrease rates: the province of Mantua, for example, reported a much faster decline in the number of Covid-19 cases and deaths with respect to the others.

3.2. *The RDC receipt: characteristics, territorial distribution and recent trend*

RDC was introduced in Italy by Law No. 26/2019. Households began to apply for the measure from March 2019, and the first transfers date back to the following month. The transfer paid to households has gradually increased over time, from a monthly average of about 525 euros in 2019, to 565 in 2020, and over 580 in 2021. To be eligible for the measure, legal age of 18 and Italian or EU citizenship are required. Citizens of other countries can also apply, but only if they have been resident in Italy for at least 10 years, the last two of which have been continuous.

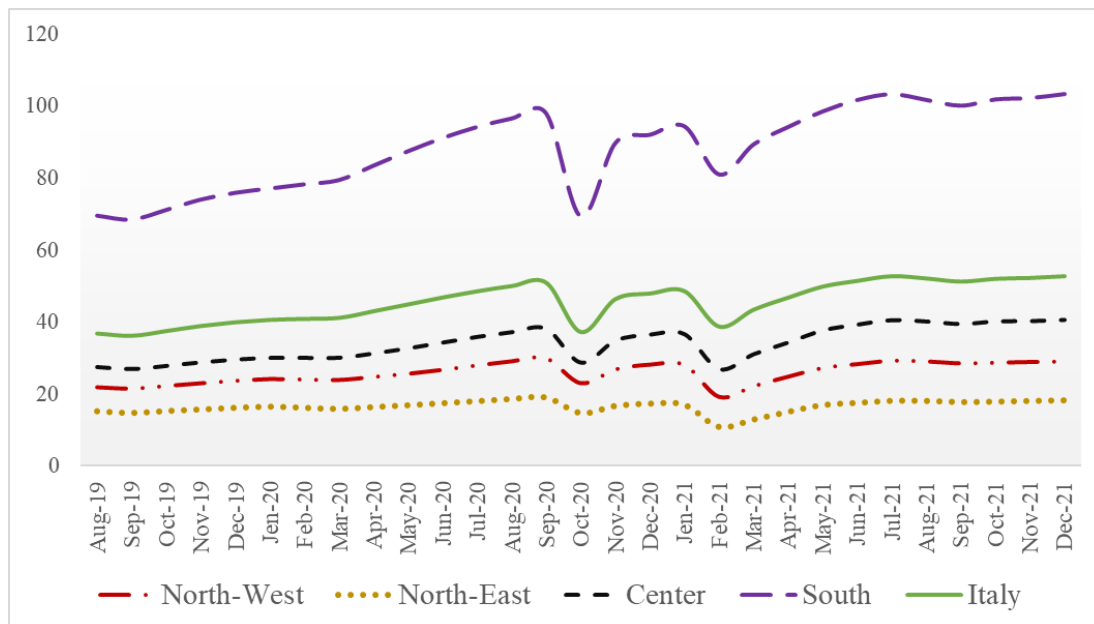
The economic requirements are fairly stringent and require considerable administrative effort, both in terms of proof of means and documentation to be submitted. In addition to other minority requirements (mainly related to recent car/motor vehicle purchase and ship ownership), RDC has four distinct economic eligibility requirements. Specifically, the household must possess: i) ISEE (i.e. the *Equivalent Economic Situation Indicator*)⁸ value of less than 9,360 €, that imposes a double administrative procedure (first for ISEE and then for RDC); ii) equivalent household income value of less than 6,000 € (9,360 € if households reside in rented houses); iii) value of movable assets not exceeding 6,000 € for a person living alone, increased according to the number of household members (up to 10,000 €); iv) value of real estate assets, other than the first house, not exceeding 30,000 €. Other requirements affect the transaction costs associated with claiming for the RDC, including willingness to tax and administrative audits, as well as declaration of immediate availability for work and adherence to an individualized job placement pathway.

⁸ The ISEE is a complex indicator combining household income and wealth. It consists of the sum of the household income and 20% of the household wealth (in terms of both financial assets and property) divided by an ad hoc equivalence scale. The ISEE equivalence scale is equal to the number of household members raised to the power 0.65.

It is important to highlight that, due to the pandemic, the Decree Law of March 17, 2020 suspends for two months the conditionalities pertaining to active job search and interviews with social services. This suspension is subsequently extended for another two months by the Decree Law of May 19, 2020. The requirements are reinstated starting from mid-July 2020. Moreover, starting from April 2020, the methods of submitting applications for the RDC are expanded, which can take place online also through the website of the National Institute of Social Security (INPS). Previously, the methods of submitting applications referred to the options: online, with the condition of having the digital identity (SPID); at tax assistance centers; at patronage institutes.

Figure 3 shows that the number of RDC recipient households reported two important drops since August 2019: in October 2020 and February 2021. Both reductions are due to administrative reasons. The maximum length of the RDC receipt is 18 months, but it can be claimed again after one month break. As many households in economic need started to receive the RDC from April 2019, several of them saw the receipt expired in October 2020 (claiming again the benefit since November 2020). As for the February 2021 drop, it is instead due to the fact that a share of households often has issues in renewing documents for the annual means-test in time.⁹

Figure 3. Trends of RDC recipients per 1,000 inhabitants between August 2019 and December 2021



Source: Elaborations of the authors on INPS statistics (2021).

⁹ The same phenomenon is not clearly visible in February 2020 because of the temporary freezing of administrative procedures due to the pandemic, but we verified that in February 2022 (which is not included in the analysis reference period). From January 2022 to February 2022, we actually observe a sharp decline in the number of RDC recipients (-18% at national level) as well.

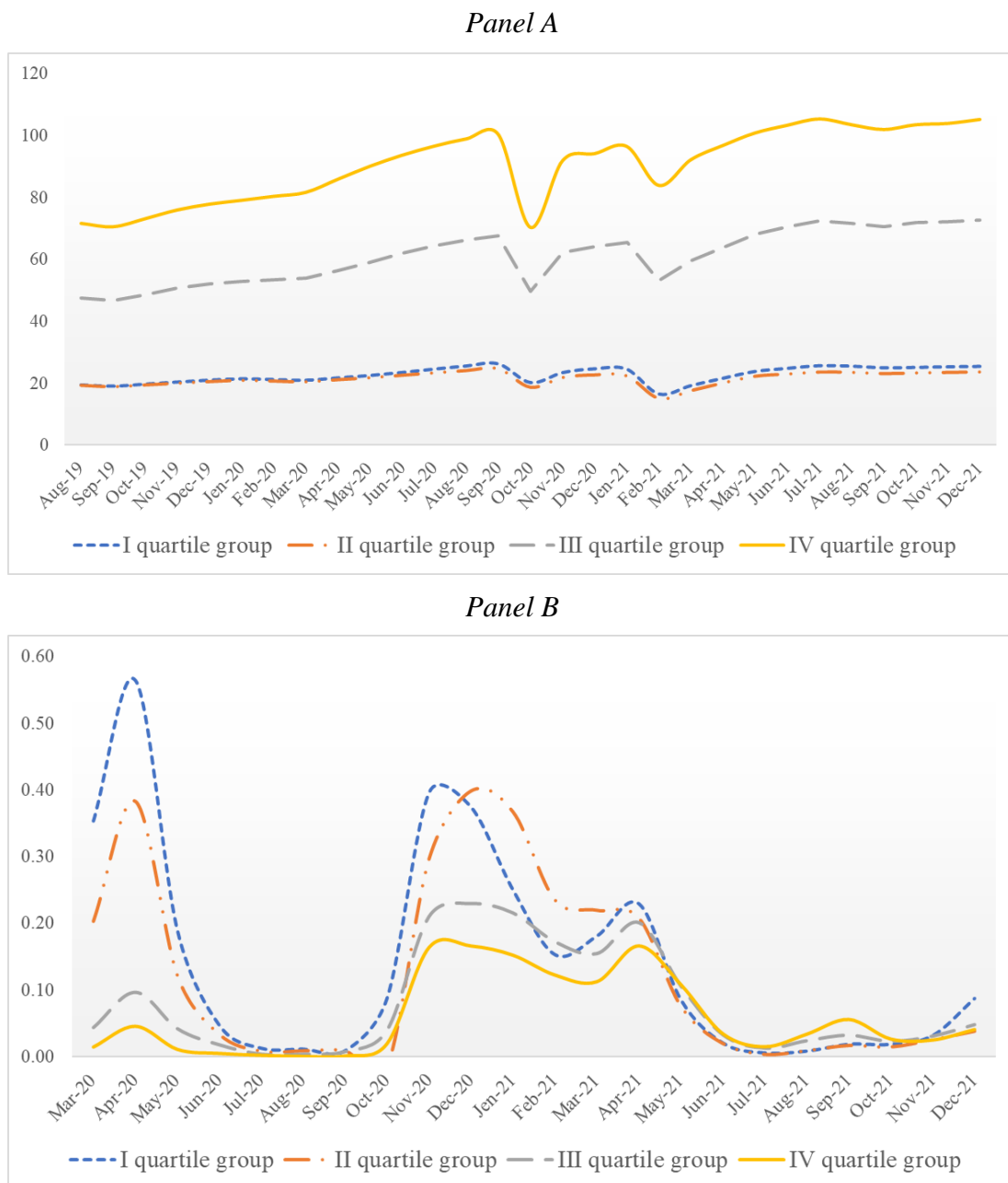
Despite the two anomalous drops, some interesting aspects can be highlighted. First, the number of RDC recipients' households was in December 2020 already similar to the September 2020 one, suggesting that most of those who completed the first tranche of RDC benefit claimed for a renewal in the very short run. Second, the RDC incidence varies on a geographical basis and it found to be higher in the South, where we observe more than 100 RDC recipients per 1,000 households (i.e. 10 percent of the total households) during most of 2021. Third, considering the month of December as yearly reference point, the number of RDC recipients increases much more in 2020 (20%) than in 2021 (10%). This is largely expected as the restrictive measures have been more severe and long in 2020 at national level, negatively affecting the labour market and the economy in general. Nonetheless, this relationship does not appear equally clear in some areas of the country. In fact, despite all Italian macro-regions report increasing trends in the number of RDC recipients' households after the pandemic (Table A2), the North-East present limited increases (+7% in 2020 and +5% in 2021) while being one of the areas with the greatest number of Covid-19 cases and deaths.

3.3. Investigating heterogeneities at local level

Before moving to the econometric part of the analysis, we provide here a further descriptive evidence on the relationship between RDC and Covid-19 looking at the territorial heterogeneity by income poverty. Given the unavailability of alternative poverty indicators at such regional level, this relevant dimension is here measured through the share of taxpayers declaring a taxable income lower than 10,000 € on the total number of taxpayers (Italian Ministry of Economics and Finance, 2018). In order to explore the territorial disparity in terms of poverty, Italian provinces are also divided into four groups, starting from those with the lowest poverty index (first quartile) to those with the highest poverty index (fourth quartile). Then, the trend of the territorial spread of RDC deaths due to Covid-19 is studied by poverty quartile group (panel A and panel B of Figure 4 respectively). Expectantly, panel A of Figure 4 shows that RDC is more spread in the poorest areas of the country (i.e. third and fourth quartiles) from the very first moment of its introduction. Restating remarks on variation in recipients in the seven months before and after the pandemic outbreak, again a greater increase in recipients in the period after the advent of Covid-19 pandemic is observed. This increase is in percentage terms very similar among the four quartiles. It is, however, larger for the poorest areas when looking at a longer time frame (March 2020 - December 2021; 21% for first quartile, 15% for second quartile, 35% for third quartile, and 28% for fourth quartile), as if to indicate a shock that initially affected both poor and rich areas, but in the medium term inflicted the worst consequences for the already poorest areas of the country. Moreover, this evidence does not seem to be related to

the virus spread, as the wealthiest areas are also the territories most afflicted in terms of victims of the pandemic (panel B of Figure 4). The same results hold when replacing the adopted poverty index with the unemployment rate as indicator of territorial economic distress (Figure A3), or when referring to a demographic indicator of territorial vulnerability, thus the dependency ratio (Figure A4).

Figure 4. RDC recipients per 1,000 households (panel A) and deaths due to Covid-19 per 1,000 inhabitants (panel B) in Italian provinces divided by poverty index



Source: Elaborations of the authors on INPS data (2021), Civil Protection Department data (2021), and Minister of Economics and Finance data (2018).

4. Econometric methods

Our basic assumption is that pandemic shocks affect the claim of social transfers. Therefore, it is expected that the evolution of pandemic trends lead to changes in the applications for the RDC benefit.

The econometric strategy is composed of two sequential parts. In the first one, we analyze the incidence of RDC recipients on provincial population in relation to the spread of Covid-19 infections and Covid-19 deaths, using fixed-effects panel data models. Regressions are distinguished by period, following the definition of different phases of virus expansion outlined in Section 3: (i) March 2020 - Sept 2020; (ii) Nov 2020 - Jan 2021; (iii) Mar 2021 – Jul 2021; (iv) Aug 2021 - Dec 2021. The months of October 2020 and February 2021 are excluded for the reasons highlighted in Section 3 regarding the decline in RDC recipients due to administrative reasons. In the second stage of the econometric analysis, to further explore heterogeneity among Italian provinces, we switch to random-effects models to account for a number of relevant (but time-invariant) demographic and socioeconomic covariates.

For the first part, we consider the following baseline panel data model specification:

$$Y_{it} = \beta_0 + \beta_1 X_{i(t-1)} + \beta_2 X_{i(t-1)}^2 + \beta_3 X_{i(t-2)} + \beta_4 X_{i(t-2)}^2 + \alpha_i + \varepsilon_{it} \quad [1]$$

Where Y_{it} is the number of RDC recipients per 1,000 households in province i at time t , $X_{i(t-1)}$ is the number of Covid-19 cases per 1,000 inhabitants in province i at time $(t - 1)$, and $X_{i(t-2)}$ is the number of Covid-19 cases per 1,000 inhabitants in province i at time $(t - 2)$. Time is considered at period $(t - 1)$ and at $(t - 2)$ because it is assumed that changes in the curve of infections affect the RDC claiming with a time lag due to possible administrative delays, periods of adjustment, or slowdowns in application procedures. We decide to adopt a quadratic polynomial form to test whether the relationship between Covid-19 positive cases and the number of RDC recipients has a nonlinear shape (e.g. it grows at an increasing rate or it grows but at a gradually decreasing rate). Finally, β_0 is the constant term, α_i is an unobserved random effect, correlated to the regressors X_{it} , which captures all unobserved time-invariant factors that affect Y_{it} , and ε_{it} is an idiosyncratic error that changes across time and units.

For the second part, we consider the following baseline model specification:

$$Y_{it} = \beta_0 + \beta_1 X_{i(t-1)} + \beta_2 X_{i(t-1)}^2 + \beta_3 X_{i(t-2)} + \beta_4 X_{i(t-2)}^2 + Z_i + u_{it} \quad [2]$$

where Z_i is a set of relevant time-invariant variables at provincial level. As usual in the random-effect panel regression analyses, we assume that the α_i term is uncorrelated with the regressors X_{it} and it is included in the error term, so that $u_{it} = \varepsilon_{it} + \alpha_i$.

As a sensitivity analysis on the effect of Covid-19 pandemic on our dependent variable, model specifications illustrated in equation [1] and equation [2] are replicated replacing Covid-19 cases with Covid-related deaths. Estimations results of these alternative model specifications are provided in Appendix.

5. Results

The econometric results indicate that all the periods analyzed, except period Aug 2021 - Dec 2021, report a significant and positive relationship between RDC recipients and Covid-19 cases (Table 1). Looking at the magnitude of coefficients, the same extent of Covid-19 cases appears leading to a much higher number of RDC recipients during the first period. This evidence confirms that massive lockdown measures implemented by the Italian government to contrast the first wave of contagious strongly reduced the transaction costs related to the RDC claiming. Interestingly, even the Covid-19 cases reported at time $t-2$ seem to be significant in (positively) explaining the growth of RDC recipient households. The intertemporal effect of Covid-19 cases on the dependent variable is likely related to the fact that the RDC claim needs time (at least a couple of weeks) to become benefit receipt. To be noted, under this perspective, we should also consider that households may ponder for some time whether to claim for the RDC benefit once affected by a negative economic shock. Coefficients of the quadratic form of our both variables of interest, when statistically significant, present a negative sign during 2020, highlighting that the effect of Covid-19 cases consists of increasing RDC recipients but with decreasing marginal rates. In other words, the pandemic has led to a rise of RDC claims (and recipients), but this effect tends to taper off as Covid-19 cases gradually increase.

Table 1. Effects of growth of Covid-19 cases on RDC recipients (fixed-effects panel model)

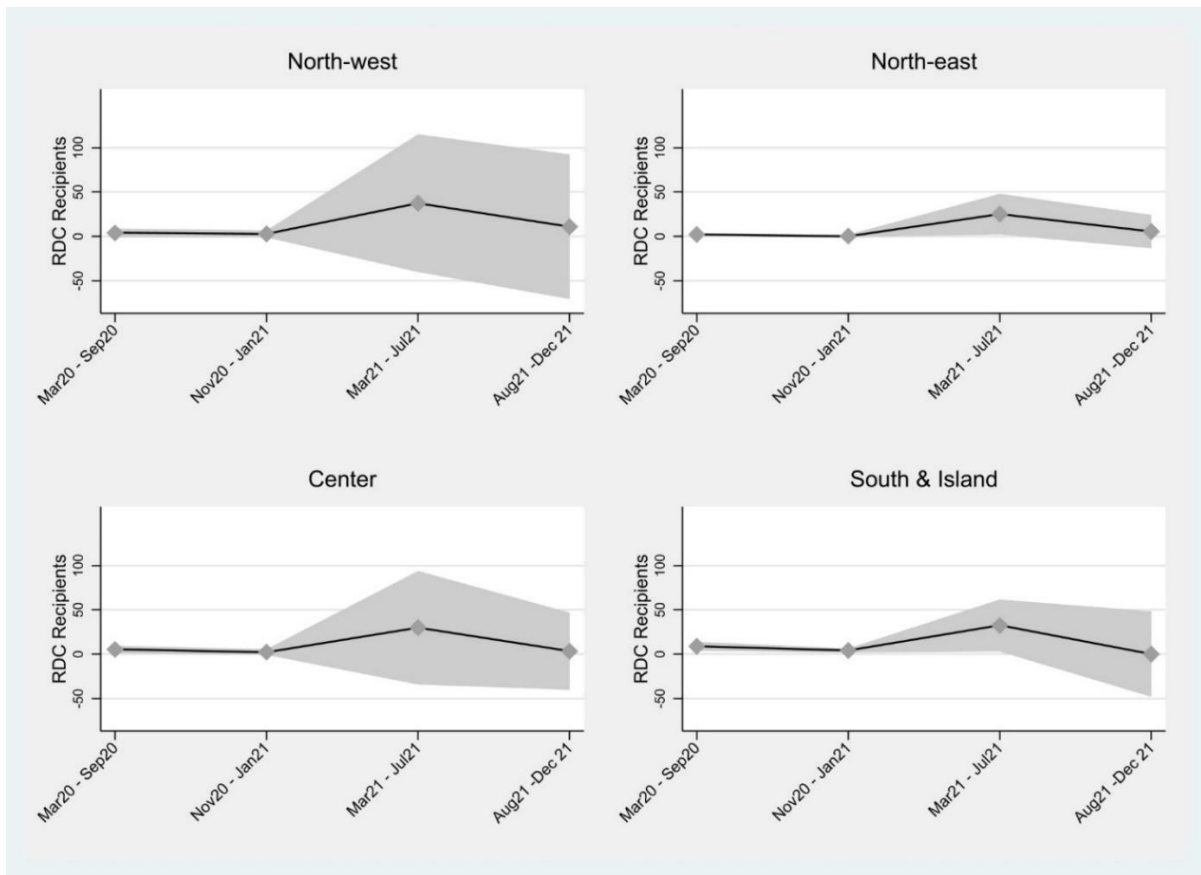
Variables	Mar 2020 - Sep 2020	Nov 2020 - Jan 2021	Mar 2021 - Jul 2021	Aug 2021 - Dec 2021
Cases (t-1)	1.021*** (0.269)	0.179*** (0.031)	0.922*** (0.130)	-0.212*** (0.037)
Cases ² (t-1)	-0.121*** (0.030)	-0.003*** (0.001)	-0.006*** (0.001)	0.001*** (0.000)
Cases (t-2)	0.730*** (0.124)	0.070** (0.030)	0.029 (0.079)	0.396*** (0.059)
Cases ² (t-2)	0.014 (0.011)	-0.001 (0.001)	0.001* (0.001)	-0.002*** (0.000)
Constant	42.229*** (0.355)	41.780*** (0.249)	11.200*** (2.148)	39.497*** (1.473)
Average number of cases at time t-1	0.63	9.52	5.66	2.43
Average number of cases at time t-2	0.59	7.10	7.01	1.76
Observations	642	321	535	535
R-squared	0.196	0.514	0.808	0.328

Notes: Standard errors clustered by Italian NUTS-3 level in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

The same considerations can also be extended for the third period (i.e. March-July 2021) except for the fact that, in this period, the effects at time t-2 lose significance. That could be explained by the adaptation of the RDC's administrative application systems to the situation of remote working, which overall engendered a speeding up of the application process. The period between August and December 2021 in contrast deviates from the expected results shown in the other three periods. It is likely that economic openings, mass vaccinations, and the new phase of active living with the virus has led to a reduction in the relationship between the pandemic and RDC applications, with the latter being more influenced by other factors.

Narrowing the analysis to the macro-regional level, the estimated confidence intervals confirm the significant and positive relationship between RDC recipients and Covid-19 cases in the first two periods (Figure 5). The third period is significantly greater than zero only for the North-East and the South of Italy, while the pandemic effect is always insignificant in the fourth period.

Figure 5. Confidence intervals of the overall Covid-19 cases effect by macro-region of residence



Notes: The figure shows the sum of the estimated coefficients multiplied by the average number of cases in each period by macro-region. The dark grey areas represent 90% confidence intervals.

When we replace the Covid-19 cases variable with the one reporting Covid-related deaths, our main considerations remain overall the same except for two points worth of mentioning (Table A3). First, the magnitude and significance of the coefficient over the period March 2020-September 2020 are stronger at time (t-2) than at time (t-1), differently from what recorded for the variable on Covid-19 cases. The second aspect concerns the magnitude of the effect of deaths at time (t-1) registered in the third period. The second aspect concerns the magnitude of the effect of deaths at time (t-1) recorded in the third period. Such a high coefficient is however counterbalanced by an equally high (and negative) coefficient of the quadratic form.

5.1. A deepening on the role of territorial characteristics

The random-effects model (Table 2) shows similar results to the previously described fixed-effects model. In particular, the significant and positive correlation between covid cases and RDC recipients is confirmed.

Table 2. Effects of growth of Covid-19 cases on RDC recipients (random-effects panel model)

Variables	Mar 2020 - Sep 2020	Nov 2020 - Jan 2021	Mar 2021 - Jul 2021	Aug 2021 - Dec 2021
Cases (t-1)	-0.158 (0.157)	0.177*** (0.031)	0.696*** (0.118)	-0.216*** (0.039)
Cases ² (t-1)	-0.017* (0.010)	-0.003*** (0.001)	-0.004*** (0.001)	0.001*** (0.000)
Cases (t-2)	1.008*** (0.152)	0.065** (0.030)	0.103 (0.071)	0.410*** (0.062)
Cases ² (t-2)	-0.030*** (0.011)	-0.001 (0.001)	0.000 (0.001)	-0.002*** (0.000)
Recipients in January 2020	1.217*** (0.028)	1.213*** (0.042)	1.348*** (0.055)	1.361*** (0.048)
Share of foreign inhabitants	0.081 (0.084)	0.162 (0.129)	0.157 (0.205)	0.128 (0.181)
Dependency ratio	-0.009 (0.105)	-0.053 (0.154)	0.210 (0.251)	-0.094 (0.188)
Poverty index	0.021 (0.059)	0.029 (0.101)	0.322** (0.138)	-0.025 (0.114)
Unemployment rate	-0.057 (0.101)	-0.005 (0.159)	0.152 (0.233)	0.053 (0.193)
Share of population living in a peripheral municipality	0.008 (0.012)	-0.006 (0.019)	0.067** (0.028)	0.014 (0.023)
Share of people with upper secondary education level	-0.006 (0.052)	-0.033 (0.090)	-0.004 (0.125)	-0.118 (0.102)
Crimes	-0.051 (0.042)	-0.014 (0.068)	0.047 (0.110)	0.002 (0.073)
Total mortality rate (per 10.000 inhabitants)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000** (0.000)
Women	0.035 (0.025)	0.041 (0.035)	-0.028 (0.055)	0.050 (0.045)
Average household members	0.000*** (0.000)	0.000*** (0.000)	0.000 (0.000)	0.000*** (0.000)
Constant	6.541*** (2.380)	6.970* (3.906)	1.929 (6.024)	5.887 (4.423)
Average number of cases at time t-1	0.63	9.52	5.66	2.43
Average number of cases at time t-2	0.59	7.10	7.01	1.76
Observations	642	321	535	535

Notes: Standard errors clustered by Italian NUTS-3 level in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Looking at coefficients of the other covariates, the variable with the larger effect and higher statistical significance is the one on RDC recipients in January 2020. In other words, territories that showed a greater use of the measure before the pandemic outbreak recorded a greater increase in applications. The importance of this proxy of the ‘territorial state dependence’ to the RDC benefit on our dependent variable appears however in line and supported by the literature on the topic (see for example Bhuller et al., 2017). The state dependence variable, which is correlated with the other demographic and

socio-economic variables included in the model, likely leads to an underestimation of the latter, which in fact are not statistically significant in most cases and for all the periods examined. The only other covariate being significant (except for the third period) is the average household size. This evidence can be related, on the one hand, to a greater generosity of the RDC benefit for larger households and, on the other one hand, to the greater economic vulnerability featuring households with children in Italy (Del Boca and Mancini, 2013).

The same considerations are obtained by replacing the explanatory variable on the number of infections with that on the number of Covid-linked deaths (Table A4). Again, the positive correlation between deaths and RDC recipients is confirmed, demonstrating that, beyond the territorial use of the measure, the pandemic played a role in RDC claims.

5.2. *Robustness checks*

To test the robustness of our results we present below two particularly relevant robustness checks. The first robustness check assesses to what extent the spread of Covid-19 contagions have reduced transaction costs related to the RDC claiming mainly for a matter of economic loss or some further non-take-up dimension takes place in this case. As for the second check, considering that RDC recipients represent a subsample of those who actually claim for the RDC benefit, it assesses whether the trend of RDC recipients effectively reflects the greater propensity to claim for social benefit during pandemic.

There may be a legitimate suspicion that the trend of RDC recipients is strongly (or even exclusively) explained by the worsening economic conditions caused by the pandemic. This would undermine the starting hypothesis that identifies transaction costs as one of the drivers of RDC recipients' trend. We therefore contrasted the growth rates of RDC recipients (between January 2020 and December 2021) with the growth rates of taxable incomes between 2019 and 2020 (declared to fiscal authorities in 2020 and 2021 respectively). The comparisons are again performed on a provincial basis. Figure A6 shows the economic decline in the country, as most provinces exhibit a negative growth in taxable income. However, focusing on the correlation between the taxable income trend and RDC recipients one, we notice that provinces with the highest increase of the RDC incidence on provincial population are not the ones with the worst performance in income trajectory. In fact, the trend line is almost flat and the slope seems rather to indicate an inverse relationship, namely that the provinces with the most declining taxable incomes are those where the number of recipients has increased the least. Therefore, this evidence suggests that the role of pandemic on the spread and the increase of RDC recipients

goes beyond the Covid-related income loss, shedding light on the relevance of a reduction of non-monetary transaction costs (e.g. stigma, conditionality, administrative barriers) in this case.

As explained before, the second robustness check tests our methodological decision of adopting the number of RDC recipients at territorial level as dependent variable rather than the number of RDC claimants. Table A5 presents the results of this check replicating Table 1 with the alternative dependent variable. Clearly, the positive and significant relationship between Covid-19 cases and the RDC spread is confirmed also in this case. Moreover, the magnitude of coefficients is higher than the one reported in Table 1, and the relationship of interest holds for the period August-December 2021 as well. To be noted, the same patterns emerge when we use Covid-related deaths instead of cases and when we estimate the random-effects panel model (more details are available upon request). Despite our results are confirmed when extending the analysis to the whole number of RDC claimants, we preferred focusing on the number of RDC recipients for the main analysis for three different reasons. First, looking at claimants, we may have a number of duplications as some households may have applied multiple times due to errors in documentations or hoping of being eligible for the benefit in a different moment of time. Second, the 18-month limit of the RDC receipt falling in October 2020 (see Section 3) led many existing recipients to reapply. Finally, claimants may also be non-eligible to the RDC benefit, so that we would include households with different economic conditions.

6. Conclusions and policy implications

We study the impact of the pandemic on population behaviors about the social assistance claiming, focusing on the case of the Italian minimum income scheme measure. Results show a significant and positive relationship between RDC recipients and Covid-19 cases trends, suggesting that the number of RDC recipients increased during periods of lockdown, which have been particularly pronounced during the first wave of contagions. This evidence confirms that the massive mobility restrictions implemented by the Italian government to counteract the virus spread strongly affected the economic well-being of households, and then reduced – as a collateral effect – the transaction costs associated with applying for the RDC benefit. Our results also appear robust to a change of Covid-19 spread proxy at territorial level (Covid-19 cases vs Covid-related deaths) and to the consideration of relevant covariates directly influencing the RDC claim at territorial level, so that main conclusions of our study overall hold.

Interestingly, the pandemic impact on the minimum income scheme claim extends beyond the worsening of economic conditions caused by the same pandemic. Analyzing the correlation between taxable income trends and RDC recipients, it is evident that NUTS-3 regions with the highest increase in the incidence of RDC recipients are not necessarily those reporting the worst income trajectories during the first year of pandemic. This sheds light on the relevance of reducing non-monetary transaction costs, such as social stigma, red tape bureaucracy, and conditionality. The advent of pandemic temporarily interrupted conditionality measures related to the RDC benefit, forced both claimants and public administration offices to use digital/online tools and faster communication channels (e.g. telephone or e-mails), and overall reduced the afraid/fear of asking for help. As a final result, reducing transaction costs to claim for an important social transfer like the RDC one likely had a positive impact on the well-being of households in financial distress, especially in some regions of the country.

In conclusion, social support policies should be designed to have simpler application procedures which avoid excessive bureaucratic costs for potential recipients. More complex yet equally important would be addressing social perception and stigma. Awareness campaigns, positive communication that avoids stigmatizing prejudices, conscious training of social service operators, or other similar strategies may help declining the stigma associated with social assistance, encouraging those in need to seek support without fear of judgment. Finally, it is essential to ensure some level of flexibility in eligibility criteria and conditionality measures generally related to minimum income schemes during periods of crisis. Even better, this flexibility decision should fall to regional authorities which better know – at least in theory – characteristics and needs of their populations and labour markets. Looking at the Italian case, for instance, the temporary suspension of the mandatory active job search seems to have led a share of the eligible but non-recipient population to claim for the cash benefit. While this outcome is already a positive one in ‘normal’ times, because it decreases the non-take-up issue and ensures that more people have a better standard of living, it turns out to be of great importance during a dramatic economic crisis. Welfare policies should therefore be designed to adapt to emerging needs, ensuring as possible that support is accessible to those who – even temporarily – need it.

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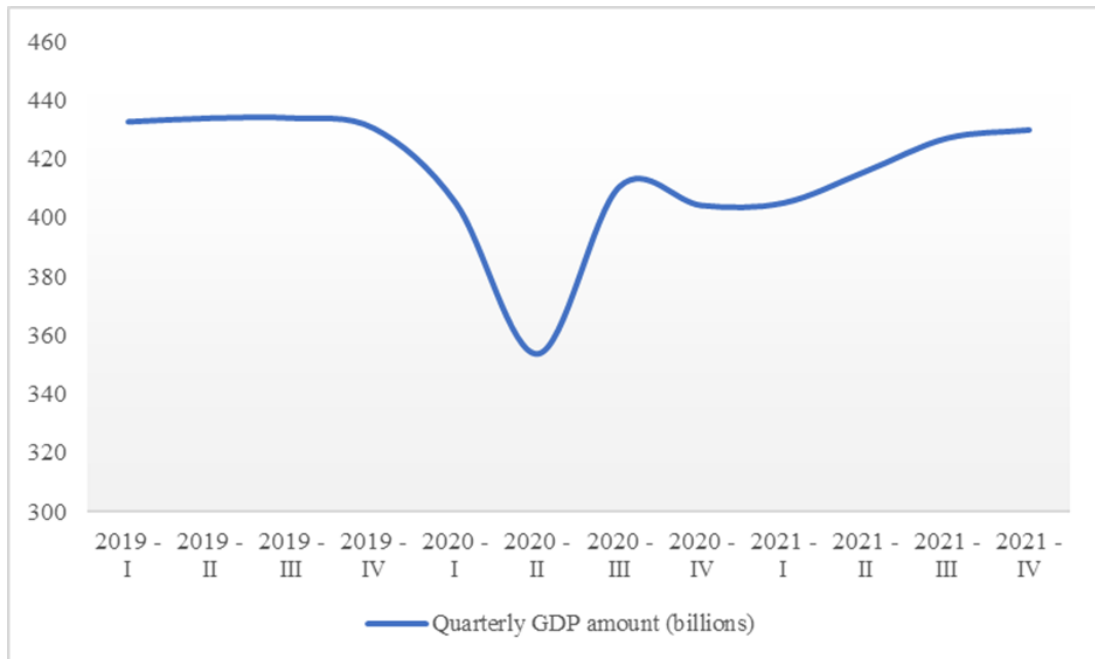
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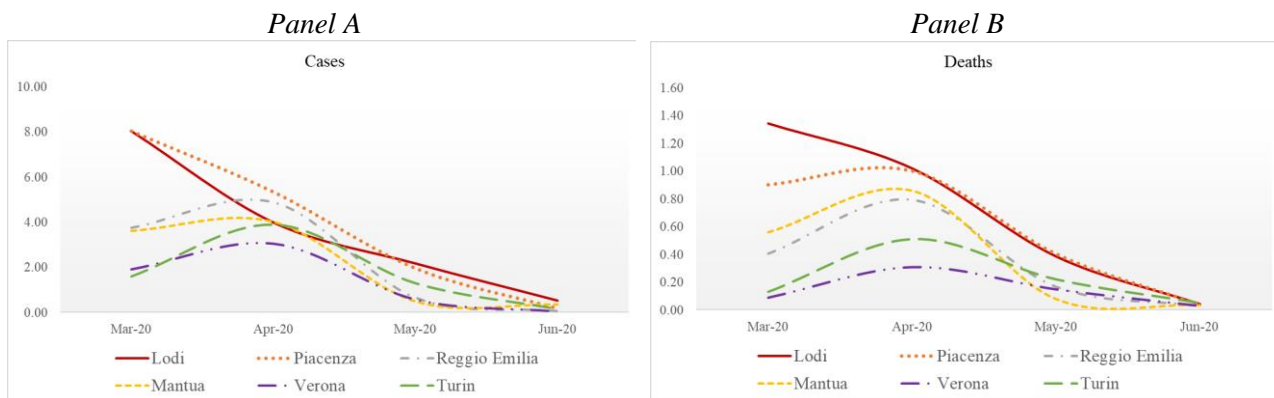
Appendix

Figure A1. Quarterly GDP amount time trend between 2018 and 2021



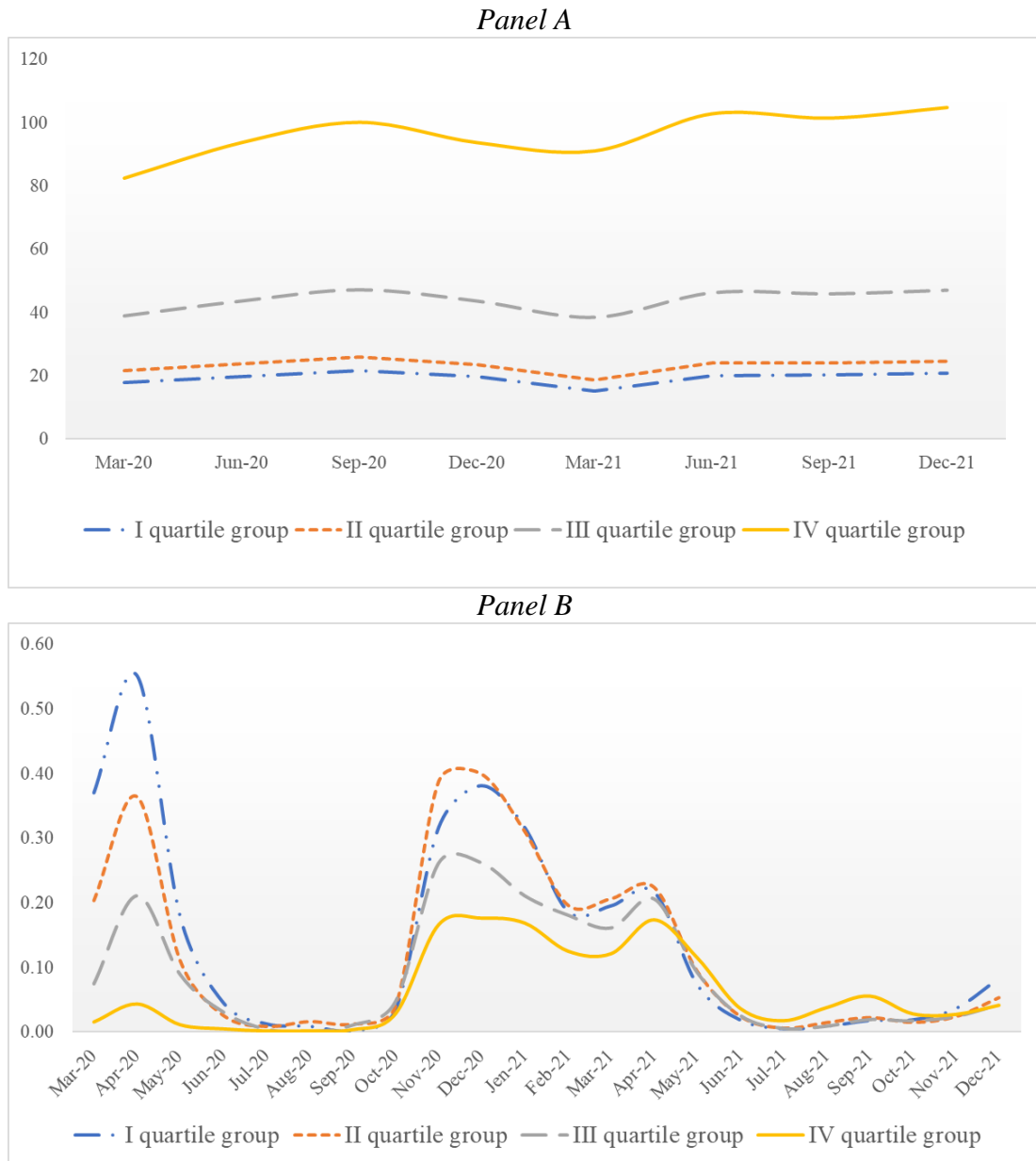
Source: Elaboration of the authors on Istat data (2021).

Figure A2. Trend of Covid-19 cases and deaths (per 1,000 inhabitants) during the first stage of pandemic in a selection of Italian provinces



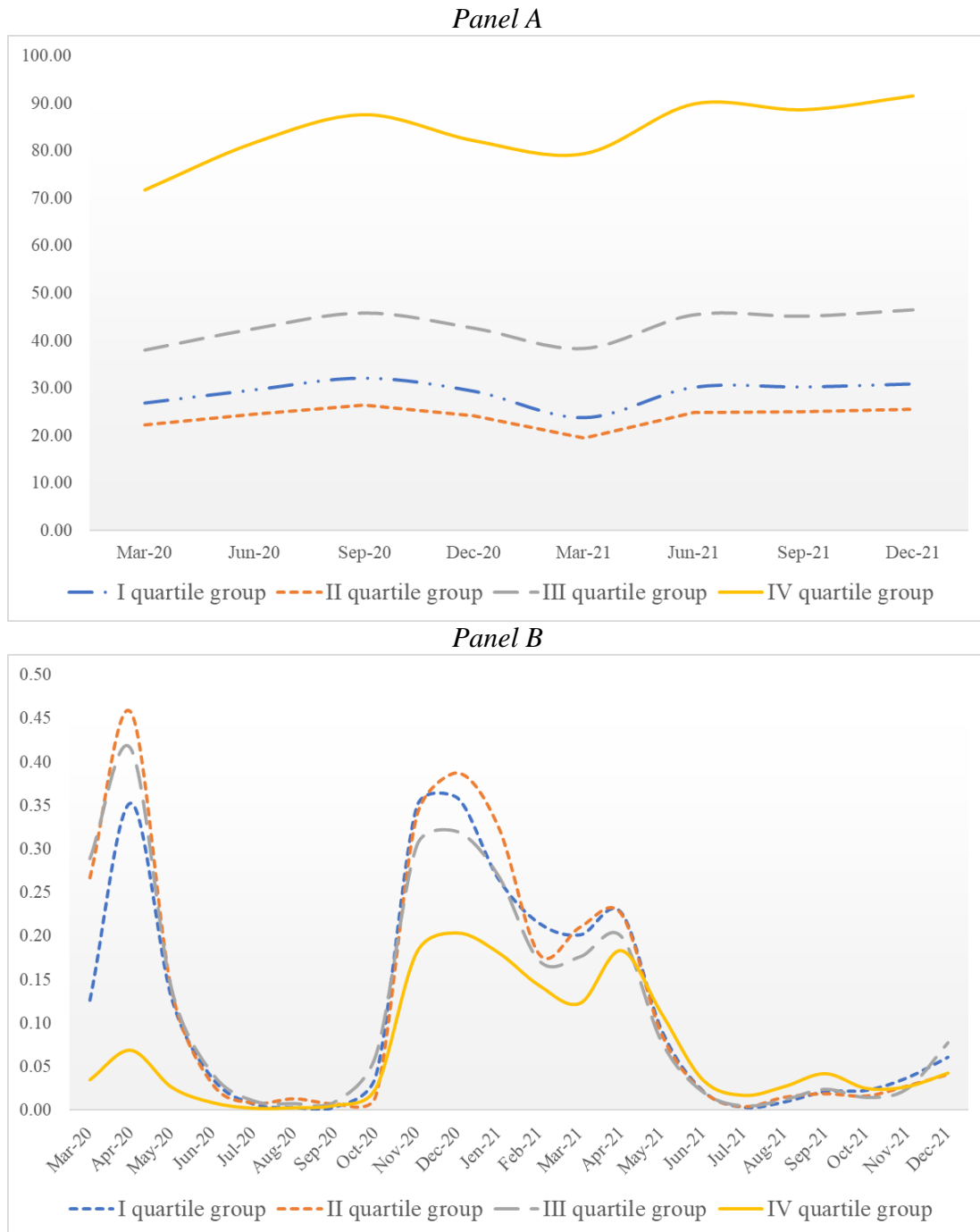
Source: Elaboration of the authors on Civil Protection Department data (2021). Notes: The number of cases and deaths reported is the one collected on the 28th day of the month. Notes: The provinces of Lodi, Mantua and Turin belong to the North-west of Italy, while Piacenza, Reggio Emilia and Verona to the North-east.

Figure A3. RDC recipients per 1,000 households (Panel A) and deaths due to Covid-19 per 1,000 inhabitants (Panel B) in Italian provinces divided by unemployment rate quartile group



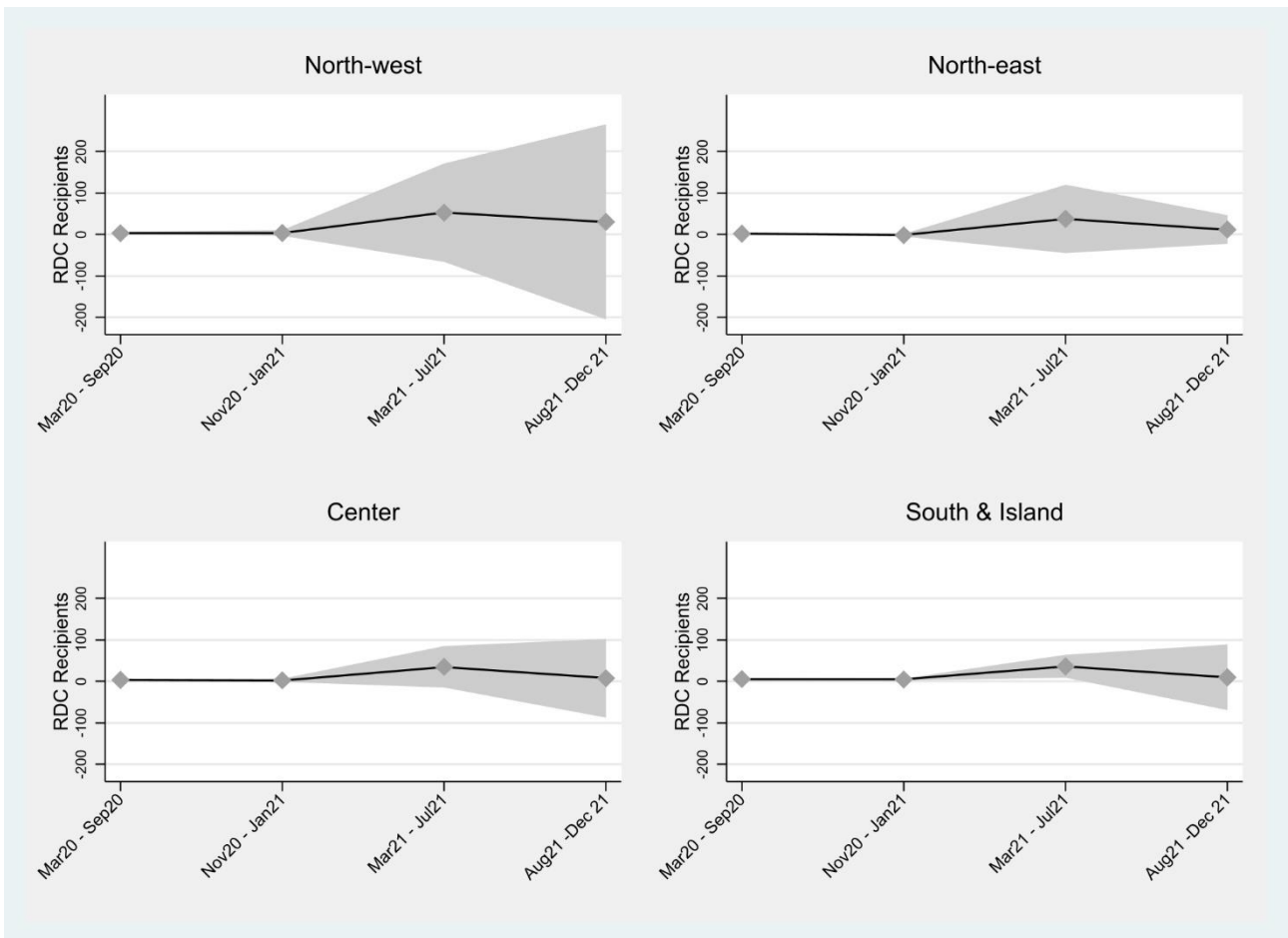
Source: Elaboration of the authors on INPS data (2021), Civil Protection Department data (2021), and ISTAT data (2019).

Figure A4. RDC recipients per 1,000 households (Panel A) and deaths due to Covid-19 per 1,000 inhabitants (Panel B) in Italian provinces divided by dependency ratio quartile group



Source: Elaboration of the authors on INPS data (2021), Civil Protection Department data (2021), and ISTAT data (2019).

Figure A5. Estimates confidence intervals on deaths by macro-region.



Notes: The figure shows the sum of the estimated coefficients multiplied by the average number of Covid-related deaths in each period by macro-region. The dark grey areas represent 90% confidence intervals

Figure A6. Relationship between growth rates of RDC recipients and taxable incomes by Italian province

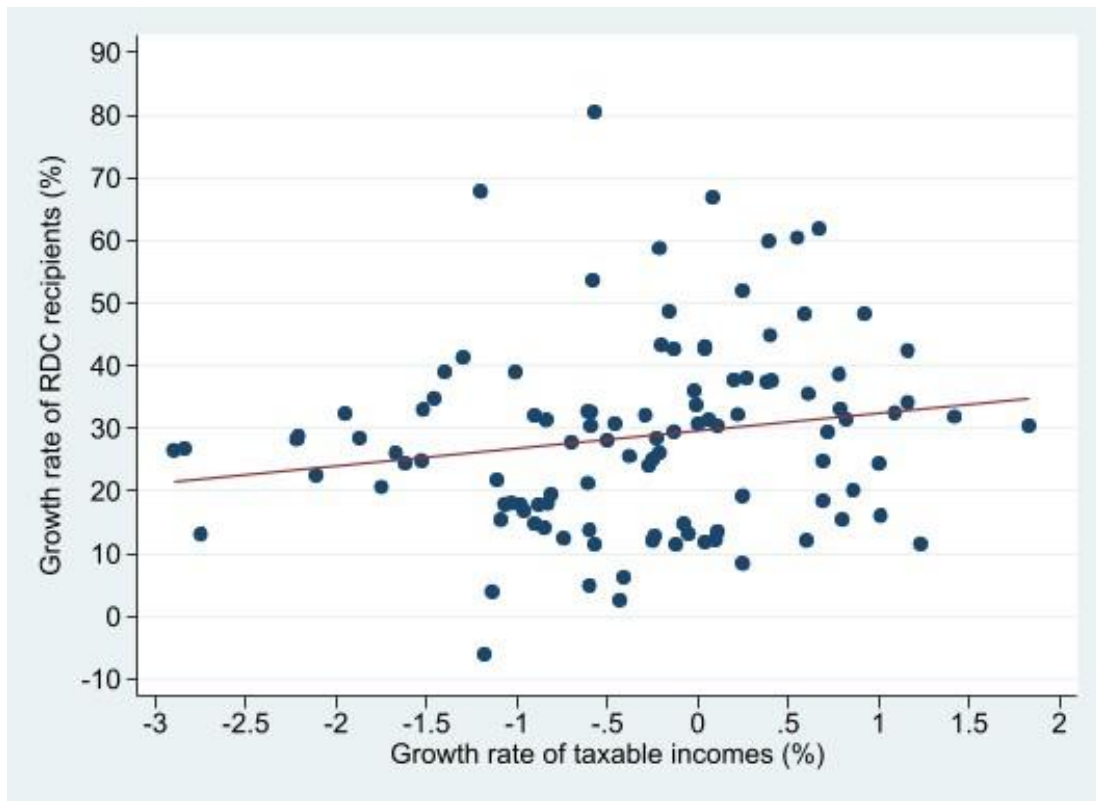


Table A1. List of variables used, including definition, source, and reference year

<i>Variables</i>	<i>Source (Year of reference)</i>	<i>Definition</i>
RDC recipients (dependent variable)	Osservatorio sul Reddito e Pensione di Cittadinanza: Italian National Social Security Institute (INPS) (2021)	Monthly trend in the number of RDC recipient households per 1,000 households at the provincial level
RDC applicants (dependent variable)	Osservatorio sul Reddito e Pensione di Cittadinanza: Italian National Social Security Institute (INPS) (2021)	Monthly trend in the number of RDC applicant households per 1,000 households at the provincial level
Cases	Civil Protection Department (2021)	Monthly trend in the number of people with Covid-19 infection per 1,000 inhabitants at the provincial level
Deaths	Civil Protection Department (2021)	Monthly trend in the number of people deceased with Covid-19 infection per 1,000 inhabitants at the provincial level. As this information is available at the regional level only, the variable is calculated for each province weighting regional Covid-19 deaths by its share of regional Covid-19 cases
Women	National institute of statistics ISTAT (2019)	Share of women at the provincial level
Average household members	National institute of statistics ISTAT (2019)	Average household members at the provincial level
RDC Recipients Jan-2020	Osservatorio sul Reddito e Pensione di Cittadinanza: Italian National Social Security Institute (INPS) (2021)	RDC recipient households per 1,000 households at January 2020 at the provincial level
Foreign inhabitants	National institute of statistics ISTAT (2019)	Share of foreign inhabitants on total population at the provincial level
Dependency ratio	National institute of statistics ISTAT (2019)	Age-population ratio of those not in the labor force to those in the labor force (i.e. aged 18-65) at the provincial level
Poverty rate	Ministry of Economics and Finance (2018)	Share of taxpayers declaring a taxable income lower than 10,000 € on total taxpayers at the provincial level
Unemployment rate	National institute of statistics ISTAT (2019)	Unemployment rate (people aged 15-74) at the provincial level
PM_pop	Ministry of Economic Development (2014)	Share of population living in a peripheral municipality at the provincial level
High school graduation rate	National institute of statistics ISTAT (2011)	Share of people aged 19 or more attained the upper secondary education level at the provincial level
Crimes	Ministry of Interior (2018)	Number of crimes at the provincial level
Mortality rate	National institute of statistics ISTAT (2017)	Total mortality rate per 10.000 inhabitants at the provincial level
Taxable incomes	Ministry of Economy and Finance (2020 and 2021)	Aggregate taxable income at provincial level

Table A2. Monthly percentage increases in RDC recipients per macro areas

	North-West	North-East	Center	South
Sep-19	-1,7%	-2,9%	-2,0%	-1,5%
Oct-19	3,4%	3,5%	3,2%	3,9%
Nov-19	3,4%	2,8%	3,5%	4,0%
Dec-19	3,0%	2,9%	2,6%	2,6%
Jan-20	2,1%	1,9%	1,6%	1,4%
Feb-20	-0,5%	-1,9%	0,1%	1,6%
Mar-20	-0,5%	-1,9%	0,1%	1,5%
Apr-20	3,6%	3,2%	3,9%	5,0%
May-20	3,5%	3,0%	4,5%	4,8%
Jun-20	4,3%	3,4%	4,9%	4,2%
Jul-20	4,6%	3,3%	4,5%	3,3%
Aug-20	4,1%	3,2%	3,6%	2,5%
Sep-20	2,7%	2,1%	2,4%	1,4%
Oct-20	-23,1%	-22,4%	-24,3%	-29,1%
Nov-20	16,8%	13,3%	20,9%	29,3%
Dec-20	5,0%	3,7%	4,7%	2,5%
Jan-21	-0,4%	-2,1%	0,3%	2,5%
Feb-21	-31,8%	-35,5%	-26,2%	-14,1%
Mar-21	15,7%	18,5%	15,1%	10,3%
Apr-21	11,9%	16,2%	10,4%	5,4%
May-21	9,8%	12,3%	9,6%	4,6%
Jun-21	4,0%	3,6%	4,3%	2,7%
Jul-21	3,3%	3,2%	3,1%	2,1%
Aug-21	-0,6%	-0,1%	-0,9%	-1,6%
Sep-21	-1,9%	-1,8%	-1,7%	-1,6%
Oct-21	0,7%	0,7%	1,8%	1,7%
Nov-21	0,7%	1,0%	0,2%	0,4%
Dec-21	0,4%	0,9%	0,8%	1,1%

Source: Elaboration of the authors on INPS data (2021).

Table A3. Effects of growth of Covid-related deaths on RDC recipients (fixed-effects panel model)

Variables	Mar 2020 - Sep 2020	Nov 2020 - Jan 2021	Mar 2021 - Jul 2021	Aug 2021 - Dec 2021
Deaths (t-1)	2.011** (0.775)	5.401*** (0.750)	28.687*** (3.486)	-2.312 (3.091)
Deaths ² (t-1)	-2.336*** (0.683)	-1.423*** (0.235)	-4.201*** (0.674)	0.443 (0.437)
Deaths (t-2)	6.006*** (0.689)	-0.668 (0.756)	0.338 (2.474)	15.210*** (2.675)
Deaths ² (t-2)	-0.585*** (0.200)	0.264 (0.209)	0.470 (0.459)	-2.132*** (0.500)
Constant	43.495*** (0.137)	41.638*** (0.420)	7.540*** (2.360)	29.887*** (2.521)
Average number of deaths at time t-1	0.10	0.21	0.13	0.02
Average number of deaths at time t-2	0.12	0.11	0.17	0.02
Observations	642	321	535	535
R-squared	0.156	0.331	0.764	0.307

Notes: Standard errors clustered by Italian NUTS-3 level in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A4. Effects of growth of Covid-related deaths on RDC recipients (random-effects panel model)

Variables	Mar 2020 - Sep 2020	Nov 2020 - Jan 2021	Mar 2021 - Jul 2021	Aug 2021 - Dec 2021
Deaths (t-1)	-1.888*** (0.688)	5.550*** (0.782)	15.617*** (3.856)	-3.186 (3.051)
Deaths ² (t-1)	-0.358 (0.257)	-1.418*** (0.237)	-3.121*** (0.762)	0.703* (0.422)
Deaths (t-2)	6.307*** (0.826)	-1.258* (0.697)	8.717*** (2.769)	16.085*** (2.609)
Deaths ² (t-2)	-1.092*** (0.266)	0.379* (0.197)	-0.427 (0.538)	-2.802*** (0.423)
Recipients January 2020	1.216*** (0.028)	1.224*** (0.043)	1.408*** (0.059)	1.392*** (0.049)
Share of foreign inhabitants	0.077 (0.081)	0.149 (0.124)	0.098 (0.229)	0.104 (0.175)
Dependency ratio	-0.006 (0.103)	-0.040 (0.159)	0.098 (0.310)	-0.114 (0.192)
Poverty index	0.008 (0.058)	0.067 (0.099)	0.519*** (0.169)	0.093 (0.107)
Unemployment rate	-0.058 (0.100)	-0.024 (0.158)	0.064 (0.244)	0.044 (0.190)
Share of population living in a peripheral municipality	0.008 (0.012)	-0.004 (0.019)	0.066* (0.036)	0.031 (0.024)
Share of people with upper secondary education level	-0.013 (0.051)	0.005 (0.095)	0.119 (0.182)	-0.074 (0.113)
Crimes	-0.045 (0.041)	0.022 (0.067)	0.274** (0.132)	0.080 (0.076)
Total mortality rate (per 10.000 inhabitants)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000*** (0.000)
Women	0.033 (0.025)	0.039 (0.034)	-0.028 (0.062)	0.014 (0.043)
Average household members	0.000*** (0.000)	0.000*** (0.000)	0.000** (0.000)	0.000*** (0.000)
Constant	6.400*** (2.361)	7.014* (3.895)	4.300 (7.624)	3.041 (4.557)
Average number of deaths at time t-1	0.10	0.21	0.13	0.02
Average number of deaths at time t-2	0.12	0.11	0.17	0.02
Observations	642	321	535	535

Notes: Standard errors clustered by Italian NUTS-3 level in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A5. Effects of growth of Covid-19 cases on RDC claimants (fixed-effects panel model)

Variables	Mar 2020 - Sep 2020	Nov 2020 - Jan 2021	Mar 2021 - Jul 2021	Aug 2021 - Dec 2021
Cases (t-1)	1.649*** (0.360)	0.013 (0.061)	0.947*** (0.157)	1.173*** (0.233)
Cases ² (t-1)	-0.175*** (0.040)	-0.003** (0.001)	-0.006*** (0.001)	-0.005*** (0.001)
Cases (t-2)	0.970*** (0.158)	0.913*** (0.108)	0.064 (0.088)	0.676*** (0.226)
Cases ² (t-2)	0.029* (0.016)	-0.013*** (0.002)	0.001 (0.001)	-0.002 (0.002)
Constant	70.241*** (0.481)	84.393*** (0.621)	76.670*** (2.795)	30.529*** (6.062)
Average number of cases at time t-1	0.63	9.52	5.66	2.43
Average number of cases at time t-2	0.59	7.10	7.01	1.76
Observations	642	321	535	535
R-squared	0.296	0.568	0.774	0.725

Notes: Standard errors clustered by Italian NUTS-3 level in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.