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# THE EFFECT OF THE GREAT RECESSION ON THE MENTAL HEALTH CARE OF IMMIGRANT AND NATIVE WORKERS IN ITALY

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# The Effect of the Great Recession on the Mental Health Care of Immigrant and Native Workers in Italy

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**Abstract**

In this paper we investigate the impact of the 2008 Great Recession on mental health care utilisation among migrant and native workers who experienced job changes during the period 2007-2011 in the Lombardy region, in Italy. We exploit a unique administrative data set about employees residing in Lombardy, matched with data on psychotropic drug prescriptions and hospitalisations for psychiatric disorders, and we employ a continuous difference-in-differences approach to estimate the causal effect of the Great Recession on health care utilisation, looking at heterogeneous effects between natives and immigrants. Our results show that the Great Recession significantly increased mental health care utilisation among native workers, while its impact on immigrant workers is minimal and statistically insignificant. To better understand the reasons behind the disparity between natives and immigrants, we analyze the impact of the Great Recession on their employment outcomes, considering employment status a key transmission mechanism, linking the economic shock to mental health care utilisation. Our labour market analysis indicates that both immigrant and native workers are negatively impacted by the Great Recession and that immigrants are more likely than Italian workers to transition from employment to unemployment in areas more severely affected by the crisis. This pattern holds across gender and age groups. Therefore, we tend to rule out the possibility that immigrants did not increase their mental health care utilisation due to a lack of labour market impact. From a broader perspective, our findings point at the complexity of the relationship between economic crises and mental health care utilisation, which can be influenced by various factors, including access to services, social stigma, and the broader economic and policy context.

JEL Code: F22, I14, E24
Keywords: Mental health care, Economic crises, Immigration, Italy

# 1 Introduction

The 2008 Great Recession has triggered important economic and social challenges across the globe, with significant implications for labour markets, health care systems, and individual well-being. In Italy, a country already struggling with several challenges and inefficiencies in the labour market, the Great Recession has exacerbated unemployment rates and job insecurity. Mental health is highly susceptible to economic and social determinants and responds differently to economic conditions than physical health (Frasquilho et al., 2015; Ruhm, 2015; Stuckler et al., 2009). This vulnerability is particularly evident during periods of economic downturn, where factors like job insecurity, financial stress, and social isolation can exacerbate mental health issues, particularly amongst more vulnerable individuals.

Over the last decades, the increase of the immigrant population has been one of the most significant socio-economic shifts observed in many developed countries. In Italy, for example, the share of foreigners has increased from 2.5% to 9.7%, over the period from 1990 to 2010. Immigrant workers, often employed in precarious or low-wage positions and more at risk of social isolation, faced higher risks during downturn periods, potentially leading to disparities in mental health care access and utilisation when compared to native workers. Recent global events like the COVID-19 pandemic, wars in Eastern Europe and the Middle East, and trade tensions between the US, EU, and China have made European policymakers more uncertain about the economic stability of the European continent (see, for instance, the former ECB President Mario Draghi's Report (Draghi, 2024)). From a policy perspective, it is therefore important to examine how an economy-wide shock, such as the Great Recession, could impact individuals' mental health and mental health care use, particularly for vulnerable people, such as immigrants. Therefore, in this paper, we exploit a unique administrative data set at the employee level from the Italian Ministry of Labour merged with data on psychotropic drug prescriptions and hospitalisations to investigate the impact of the Great Recession on mental health care utilisation among immigrant and native workers.

A substantial body of literature has examined the health impact of the 2008 Great Recession. Existing studies have examined the impact of the Great Recession on a wide range of health-related outcomes including mortality (Finkelstein et al., 2024; Strumpf et al., 2017; Tapia Granados and Ionides, 2017), self-reported health status (Belloni et al., 2016; Colombo et al., 2018; Currie et al., 2015; Peng et al., 2022; Wang et al., 2018), chronic diseases (Belotti et al., 2022), health behaviour (Ásgeirsdóttir et al., 2016; Jofre-Bonet et al., 2018; Peng et al., 2022; Wang et al., 2018), and drug consumption (Bassols and Castelló, 2016; Currie et al., 2015). Most of these studies found a deteriorating effect of the 2008 economic crisis on health outcomes in the general population or at least among some vulnerable groups such as racial minorities and less-educated individuals. In the

case of Italy, Colombo et al. (2018), combining macro-economic data with survey data for the period 1993-2012, show that higher unemployment rates are associated with an increase of reporting health diseases in the general population, including nervous disorders. Similarly, Petrelli et al. (2017), in a descriptive study using survey data from 2005 and 2013, highlight that the 2008 economic crisis negatively impacted self-perceived mental health among both natives and migrants, with men being particularly affected.

While there is ample evidence that the economic crisis in 2008 deteriorated mental health status, evidence on how the Great Recession affected mental health care use is limited and results are controversial (Martin-Carrasco et al., 2016; Silva et al., 2020). When looking at the Italian case, Wang and Fattore (2020) consider hospital discharge data aggregated at the local labour market level between 2007 and 2015, and report a significant impact of higher unemployment rates on admissions for severe mental disorders, with most pronounced effects in economically disadvantaged areas. Belotti et al. (2022) employ a large longitudinal data set collected by general practitioners between 2004 and 2017 regarding a sample representative of the Italian population and show that the Great Recession affected individual-level incidence of cardio-vascular diseases and depression, as measured by the probability of receiving a diagnosis of the given disease at chronic level. By exploiting heterogeneity by gender and age, they find that province-level economic downturns have a significant effect on depression only for males and elderly individuals. Other studies find no significant impact or even a decline in mental health service use (such as a reduction in psychotropic drug consumption), and this could be due to stigma or financial barriers (e.g., García et al. (2014) for Spain, Dackehag et al. (2023) for Sweden).

Few studies investigating the causal effect of the economic crisis on mental health care have focused on its differential impact on natives versus migrants, the latter being a particularly vulnerable group. Furthermore, the available evidence is inconsistent. Gotsens et al. (2015) find that in Spain the 2008 economic crisis has disproportionately affected the health status of immigrants. This is demonstrated by the equalization in psychotropic drug use, with immigrants' previously lower use converging to that of natives. Focusing on ethnic minorities in the United States, Chen and Dagher (2016) show that both male and female African Americans reduced their physician visits for mental health disorders. African American males also had a significant reduction in prescription drugs for mental health disorders, while African American females had an increase in drug prescriptions during recession years. The authors emphasize that their findings suggest racial and ethnic minorities, who already faced poorer access to health care compared to whites before the Great Recession, may have experienced further deterioration in access during the economic downturn. These findings point at the complexity of the relationship between economic crises and mental health care utilisation, due to the influence of various factors, including access to services, social stigma, and the broader economic and policy context,

which may be particularly significant for immigrants.

Using a unique administrative data set from the Lombardy region of Italy, in this paper we examine the impact of the Great Recession on mental health care utilisation among immigrant and native workers. Lombardy is particularly well-suited for our research question, as it is one of the largest, most populous, and wealthiest regions in Italy, accounting for 23% of the entire migrant population legally residing in the country (Centro Studi e Ricerche IDOS, 2024; Dustmann et al., 2017). We note also that immigration in Italy is largely low-skilled. For example, in 2010/11, as many as 86% of immigrants in Italy had a high school education or less—by far the highest proportion among developed economies. In comparison, the share of low-skilled immigrants was 44% in the UK, 45% in Australia, and 36% in Canada (Brunello et al., 2020). Furthermore, despite its status as a wealthy and productive region, Lombardy experienced one of the sharpest increases in unemployment during the Great Recession (Belotti et al., 2022).

We gathered data from the Italian Ministry of labour on the duration and type of employment contracts (temporary or permanent) for all immigrant and native workers in Lombardy who experienced job transitions between 2007 and 2011, including hires, separations, and contract extensions or conversions. We matched these data with records on psychotropic drug prescriptions and hospitalisations for psychiatric disorders to analyze mental health care utilisation. This data set is well-suited to detect the impact of changing employment status and prospects on the mental health of individuals in the labour markets.

Unlike previous studies that predominantly estimate the relationship between local unemployment rates and mental health outcomes, we consider the Great Recession as a shock that hits the economy with uneven effect across different local labour markets (LLM), and employ a continuous difference-in-differences approach to estimate the causal impact of the Great Recession on individual health care use. To strengthen the causal interpretation of our results, we incorporate an event study design. In addition, the longitudinal nature of the data set allows us to control for a range of fixed effects, including individual fixed effects, thereby reducing potential confounding factors when analyzing the relationship between individual health and the economic crisis. Our results show that the Great Recession significantly increases mental health care utilisation among native workers, while its impact on immigrant workers is minimal and statistically insignificant. To better understand the reasons behind the disparity between natives and immigrants, we then analyze the impact of the Great Recession on their employment outcomes. Employment status serves as a key transmission mechanism linking the economic shock to mental health care utilisation, as widely documented in the literature on the relationship between mental health and labour market conditions (e.g., Farré et al., 2018; Moscone et al., 2016). In particular, we investigate whether the labour market performance of migrants has been less affected by the Great Recession, compared to the performance

of natives. Our labour market analysis indicates that both immigrant and native workers were negatively impacted by the Great Recession. Further, immigrants were more likely than Italian workers to transition from employment to unemployment in areas more severely affected by the crisis. This pattern holds across gender and age groups. Therefore, we tend to rule out the possibility that immigrants did not increase their mental health care utilisation due to a lack of labour market impact. Instead, the results point to the possibility that immigrants may be more affected by mental health stigma, which could, in turn, make them less likely to seek mental health care, as suggested by Bharadwaj et al. (2017).

A key contribution of our analysis is the exploration of the heterogeneity in mental health care utilisation in the presence of an economic shock by immigration status. Particularly within the Italian context, to the best of our knowledge, no studies have investigated this research question using physician-assessed mental health outcomes, which provide more reliable indicators than self-reported mental health. Moreover, the richness of the labour market information in our data set allows us to track workers over several years, capturing their transitions from stable employment to temporary jobs or even their job loss. This enables us to uncover mechanisms underlying changes in mental health care use, providing a better understanding of the effects of the Recession.

The remaining of the paper is structured as follows. In Section 2 we introduce the data, while in Section 3 we describe our empirical approach. In Sections 4 we discuss the empirical results, while in Section 5 we investigate whether changes in employment status act a transmission mechanism linking the Great Recession shock to mental health care utilisation. Finally, 6 concludes with some concluding remarks.

# 2 Data

For our analysis we collected data from various sources. First, we obtained administrative data on workers residing in the Lombardy region from the Italian Ministry of Labour. Since 2007, Italian firms are required to electronically report all hires, separations, contract extensions, and conversions. The Compulsory Communications (CC) system records each workforce movement in both private and public Italian firms. For each movement, the system captures details such as the event date, worker identity and worker characteristics, including age, gender, nationality (Italian/foreign)[1], educational level, and place of residence. It also indicates whether a worker's contract is temporary in

[1]In our data set we do not have information on the nationality of immigrants. However, in Lombardy the majority of immigrants are low-skilled and from developing countries. For the year 2007 the major nationalities were: Romania 11.5; Marocco 10.7; Albania 9.9; Egypt 5.4; Philippines 5.2; China 4.4; India 4.0; Peru 4.0; Ucraina 3.4; Ecuador 3.2; Senegal 3.1; Pakistan 2.3; Sri Lanka 2.5; Tunisia 2.1; Moldova 1.7; Bangladesh 1.5; Ghana 1.4; Brazil 1.2. These nationalities cover around 78 percent of immigrants in Lombardy, see `https://demo.istat.it/`

one of the following ways: fixed period contract, agency temping, casual work, seasonal work or other fixed-term work. We extracted employment data for all workers appearing in the CC system during the years from 2007 to 2011. We note that our data set does not include information on self-employed individuals, such as freelancers or consultants. The employment contract data set, which tracks work-related events, includes data on 3,589,655 workers followed over the years from 2007 to 2011.

For all workers in the employment contract data set we gathered data on prescriptions for antidepressants, mood stabilizers, and antipsychotics with ATC codes N05, and N06, issued either by General Practitioners or by specialists. These medications were selected as they are commonly used to treat major psychiatric disorders classified under Axis I (Clinical Disorders) in the Diagnostic and Statistical Manual of Mental Disorders. Prescription data were collected from the PSICHE electronic register, which records prescriptions and epidemiological information for all residents of the Lombardy region. Additionally, we have collected data on hospitalisations for psychiatric disorders for all workers included in the employment contract data set. The data set encompasses 6,551,542 prescriptions and 58,402 admissions spanning the years 2007 to 2011.

After matching the employment contract data set with medical records, we apply some sample restriction criteria. First, we exclude individuals who are younger than 18 years old and older than 64 years old from the analysis. This age restriction aligns with previous research on the Italian labour market (Moscone et al., 2016; Wang and Fattore, 2020). Next, we keep only individuals observed before the start of the Great Recession, namely the second quarter of 2008, and follow them up to the fourth quarter of 2011, to ensure the validity of our empirical strategy. Finally, due to the presence of outliers, we put a cap to all records with a number of prescriptions exceeding the 95th percentile. Following these procedures, we obtain a final sample with 42,725,842 observations and 2,244,254 workers, of which 81.82% are Italian workers and 18.00% are immigrant workers. The remaining 0.18% consists of individuals with no citizenship information. Table 1 shows descriptive statistics for the individual socio-demographic characteristics, mental health care utilisation, and labour market outcomes of the individuals in our final sample. Significant demographic differences exist between immigrant and Italian workers. On average, immigrant workers in the Lombardy region were younger, had lower levels of education, and included a smaller proportion of females compared to their Italian counterparts during the sample period. There was a large gap in mental health care utilisation between immigrants and native workers. A typical Italian worker had 0.13 mental health prescriptions in one quarter during 2007 - 2011, while this number was less than 0.03 for an immigrant worker. In addition, during the sample period on average native and immigrant workers were hospitalized 0.001 times and 0.0004 times, respectively, due to mental health reasons. Such substantial differences in mental health care utilisation may

not be explained solely by the age and gender disparities between immigrants and Italian workers and the selection bias of the immigrant population. Reduced access to mental health care, lower levels of health literacy, and lower willingness to seek mental health treatment are likely to contribute to such gaps. Spinogatti (2015) analyses differences in mental health service utilisation by immigrant and native populations in Lombardy in 2010, and finds a similar pattern. Underutilisation of mental health care services by migrants is also documented by Patel (2017) and Sarría-Santamera A (2016).

Immigrant workers are in disadvantaged positions in the labour market. As shown in the last three rows of Table 1, they had fewer days covered by an employment contract in a typical quarter compared to native workers during the sample period. Additionally, immigrant workers faced a higher likelihood of job loss than their native counterparts.

## 2.1 Unemployment data

In Italy, local labour markets (sistemi locali del lavoro "SLL" in Italian) are functional areas defined by commuting patterns by the Italian National Statistical Office (ISTAT), reflecting the geographical scope of local labour markets. There were 51 SLLs in the Lombardy region in 2011. For each labour market area, we measure the intensity of the Great Recession using the change in unemployment rates before and after the economic shock, namely between 2007 and 2009. Annual unemployment rates of these SLLs during the sample period are obtained from the Italian Office of National Statistics (ISTAT).

Trends in unemployment rates and geographical distributions of unemployment rate changes in the Lombardy region are illustrated in Figure 1 and Figure A.1. Figure 1(a) depicts how the average, maximum, and minimum SLL employment rates in Lombardy evolve over the sample period 2007-2011, highlighting a sharp increase in unemployment rates following the onset of the Great Recession in 2008. The average unemployment rate among all SLLs in Lombardy rose from 3.30% in 2007, the pre-crisis period, to 5.32% in 2009, one year after the crisis began. A similar pattern is observed across almost all Lombardy SLLs, as detailed in Figure A.1 in the Appendix, which tracks unemployment rate changes from 2007 to 2009 for each SLL.

There are considerable variations in the unemployment rates and their changes during the Great Recession across different SLLs. As shown in Figure 1(a), there is a persistent gap of approximately 2.5 percentage points between the maximum and minimum unemployment rates in Lombardy from 2007 to 2011. Furthermore, the changes in the unemployment rate before and after the Great Recession exhibited a highly heterogeneous pattern across SLLs. As shown in Figure 1(b), some SLLs saw unemployment rates rise by over 2.5 or even 3 percentage points following the Great Recession, while several SLLs were only mildly affected, experiencing increases in unemployment rates by less than 1.5 percentage points.

# 3 Empirical strategy

In this paper, we consider the Great Recession as an unexpected shock that hits the economy once but had uneven effects across different areas. The uneven effects of the Great Recession across different areas can be seen from the evolution of macroeconomic indicators around 2008. Figure A.1 in the Appendix shows the trends in the unemployment rate in all the SLLs in the Lombardy region between 2007 and 2011. All SLLs witnessed a significant unemployment rate jump between 2008 and 2009, although the magnitude of the increase varies across SLLs. Notice that there was another large increase in the unemployment rate in 2012 resulting from the Sovereign debt crisis. Therefore, our study only examines the impact of the first phase of the Great Recession using data until 2011 to avoid the difficulties in separating the effects of two large economic shocks.

Conceptualizing the economic crisis as an unforeseen shock allows us to adopt a continuous difference-in-differences framework to estimate its impacts (Callaway et al., 2024; Roth et al., 2023). Our main empirical specification is:

$$Y_{iat} = \beta \cdot CrisisSeverity_a * After_{2008Q2} + \alpha_i + \gamma_t + \epsilon_{iat}, \tag{1}$$

where $Y_{iat}$ is the mental health care use of worker $i$ in SLL $a$ in year-quarter $t$. According to the official statistics, the Great Recession hit Italy in April of 2008. Since we have quarterly data, we can precisely identify the onset of the crisis. Accordingly, we define the after-crisis dummy, $After_{2008Q2}$, equal to 1 for all the quarters from 2008Q2 onward and 0 otherwise. Following Yagan (2019) and Finkelstein et al. (2024), the area-specific severity of the Great Recession, $CrisisSeverity_a$, is measured as the percentage point increase in the unemployment rate in the SLL $a$ between 2007 and 2009, that is, the difference between the unemployment rate at the end of the crisis and its level in the year preceding the downturn. Individual fixed effects $\alpha_i$ are included in all the analyses to control for all the individual-specific time-independent determinants of mental health care use such as gender, education, and individual's baseline mental health condition. We also control for quarter fixed effects to avoid time-varying factors that affect everyone's mental health uniformly. $\epsilon_{ict}$ is the error term. The coefficient of interest is $\beta$, which is interpreted as the average change in the mental health care use $Y$ after 2008Q1 associated with a one-percentage-point increase in the unemployment rate change between 2007 and 2009.

We estimate equation (1) using ordinary least squares (OLS). Standard errors are clustered at the SLL level, the same level of aggregation we use to measure the severity of the Great Recession.

The continuous difference-in-differences framework requires parallel trend assumption as an identification assumption. In our context, the parallel trend assumption means that individuals exposed to different levels of shocks would have the same mental health care trajectories if they had been exposed to the same economic shock. In this study, we test

this assumption by adopting an event study design. The event study specification is as follows:

$$Y_{iat} = \sum_{t=2007Q1}^{2011Q4} \beta_t [CrisisSeverity_a * \mathbb{1}(Quarter_t)] + \alpha_i + \gamma_t + \epsilon_{iat}, \quad (2)$$

where $\mathbb{1}(Quarter_t)$ is an indicator for year-quarter $t$ and the other terms have the same meaning as in equation (1). The first quarter of 2008, which is the period before the start of the Great Recession, is our reference period and therefore $\beta_{2008Q1}$ is set to 0. $\beta_t$ can be interpreted as the impact of the economic crisis shock on outcome $Y$ in year-quarter $t$, relative to the impact in the reference period. We can test whether the parallel trend assumption holds in periods before the crisis by examining the significance of $\beta_t$'s before the reference period. From the pattern of $\beta_t$'s after the reference period, we can also see how the impact of the Great Recession evolves over time.

Importantly, we estimate equation (1) separately by subgroups to explore the heterogeneity by immigrant status. Then, we further stratify the immigrant sample and native sample by gender and age. We consider three age groups: 18-35 years old, 35-49 years old, and 50-64 years old. This is consistent with the age division in previous research using the same data (Moscone et al., 2016). Theoretically, the heterogenous effect of the Great Recession on mental health care for immigrants and natives is ambiguous: on one hand, one would expect that immigrants are more likely to be negatively affected by economic shocks in terms of labour market outcomes and mental health status; on the other hand, however, immigrants may ignore the importance of receiving mental health treatment, have less access to the mental health care services, or fear of losing labour market opportunities due to the social stigma associated with mental disorders, even if their mental health was affected during the economic crisis.

# 4 Results

## 4.1 The Great Recession and Mental Health Care

### 4.1.1 Baseline results

Table 2 presents the results from estimating equation (1) for the number of psychiatric prescriptions and the number of hospitalisations. Standard errors clustered at the SLL level are in parenthesis. As shown in column (1) of panel A, on average, one percentage point rise in unemployment rate change between 2007 and 2009 increases the number of psychiatric prescriptions within one quarter after the start of the crisis by 0.026 for all workers in the sample. This is not a trivial impact as it is equivalent to about 23.19% of the average number of prescriptions in the sample. Further, a one-percentage-point increase in the unemployment rate change between 2007 and 2009 leads to a slight

increase in the number of hospitalisations in each quarter after the beginning of the crisis, as seen in column (2) of panel A. However, this impact is very small and not statistically significant at the conventional significance levels.

Panel B and C of Table 2 report the estimated results for equation (1) for immigrants and natives, respectively. The impact of the Great Recession on natives' number of mental illness prescriptions is positive and statistically significant at the 1% level but the impact on immigrants is not statistically distinguishable from 0, with a statistically significant difference.[2] In terms of the number of hospitalisations, both groups are not affected significantly.

The results reported in Table 2 can be interpreted as the causal impact of the economic shock introduced by the Great Recession on mental health. A key assumption for this interpretation is the parallel trends assumption. This assumption can be tested by estimating equation 2. Figure 2 plots the estimated $\beta_t$'s and their 95% confidence internals for the whole sample, with the coefficient $\beta_{2008Q1}$ (the period before the start of the Great Recession) normalized to 0. The red line indicates the second quarter of 2008, the start of the crisis. Figure 2 (a) and (b) report the estimation results for the psychiatric prescriptions and hospitalisations, respectively. It is clear that the coefficients before the start of the Great Recession are close to 0 and statistically insignificant in both plots, implying that there is no pre-trend for both outcomes. The event study allows us also to examine the persistence of the effect of the Great recession on the outcomes of interest. As shown in Figure 2 (a), there was an immediate increase in the number of prescriptions in the second quarter of 2008. Such effects became gradually more relevant as time went by, suggesting that the negative effect of a large economic crisis on mental health prescriptions is enduring. In contrast, Figure 2 (b) shows that the impact on hospitalisation was always close to 0 and statistically insignificant during the whole period of study.

The estimation results of equation 2 for the immigrant sample and native sample can be found in Figure A.2 in the Appendix. Similar to the pattern in Figure 2, the parallel trend assumption holds for both the immigrant subsample and the native subsample. Results presented in Figure 2 and Figure A.2 provide clear evidence that the parallel trend assumption holds and therefore the results in Table 2 can be interpreted as the causal impacts of the Great Recession. The estimated coefficients for prescriptions in the native sample are increasingly positive and statistically significant in most of the years following the crisis. In contrast, for the migrant sample, a positive and statistically significant effect emerges only in the medium run, and the magnitude of the effect is smaller compared to that observed in the native sample.

[2]We tested whether the difference in the coefficients for migrants and natives is statistically different from zero using a fully interacted model. Results are available upon request.

### 4.1.2 Heterogeneity analysis

As shown in Table 1, immigrant workers, on average, have significantly lower educational attainment than native workers. We wonder whether this educational gap may help explaining the heterogeneous impact of the Great Recession as found in Table 2. To examine this possibility, we estimate the baseline model only for low-skilled workers.[3] Results in Table 3 show that the estimated coefficients for migrant workers are still statistically insignificant. For native workers, both drug prescriptions and hospitalisations due to mental disorders are significantly higher in areas where the economic crisis is stronger.

We next stratify the immigrant and native samples by gender and investigate how the Great Recession affected mental health care utilisation in each subgroup. Results are presented in Figure 4. As seen in panels A and B, among immigrants, the coefficients for both male and female immigrants are not statistically significant at conventional levels, as in the baseline analysis.

The estimated coefficients for mental health prescriptions in the native sample are positive and statistically significant at the 1% level for both males and females. More specifically, the average number of prescriptions increased by 0.024 for female Italian workers following a one-percentage-point increase in the local unemployment rate due to the Great Recession. For male Italian workers, the corresponding increase was 0.033. Moreover, we observe a significantly positive impact of the Great Recession on hospitalisations for male Italian workers. However, the effect of the 2008 economic crisis on hospitalisations is very close to 0 and statistically insignificant for female Italian workers. This is in line with previous evidence that males' mental health and mental healthcare use are more affected by the economic crisis than females (Belotti et al., 2022; Buffel et al., 2015; Jofre-Bonet et al., 2018; Petrelli et al., 2017).

Finally, we explore the heterogeneity by citizenship, gender, and age. Results are reported in Table 5. As shown in the first three panels, when we stratify the sample of immigrants by gender and age, the Great Recession did not have a significant impact on psychiatric prescriptions or hospitalisations in any subgroup. However, we observe some interesting patterns among the native workers. First, the positive impacts of the Great Recession on native workers' mental health medication uses are concentrated among young and middle-aged workers, while the effects on Italian workers older than 50 years old are insignificant. Second, for both young and middle-aged native workers, the effects on mental health prescriptions are more pronounced for males compared to females. This is consistent with the heterogeneous effects by gender shown in Table 4.

[3]We define low-skilled workers as individuals with, at most, a Level 2 (lower secondary) education, according to the International Standard Classification of Education (ISCED).

## 4.2 Robustness Checks

In this section, we conduct a series of robustness checks to test whether our baseline results are sensitive to several specification changes. First, we apply a 99th percentile cap to the number of prescriptions instead of a 95th percentile cap as in the baseline analysis. Results are shown in column (1) of Table 6. Overall, the results are similar to the baseline results. For native workers and the whole sample, the magnitude of the effects is larger than the baseline results. For immigrant workers, the effects are similar to the baseline results in both magnitude and statistical significance.

We then test whether the baseline results hold when the SLL of Milan - the largest by resident population in Italy - is excluded from the analysis. More than 40% of observations in our final sample is from Milan. As shown in columns (2) and (3), excluding these individuals does not significantly change the magnitude and statistical significance of baseline coefficients, implying that our baseline results are not solely driven by a single large SLL such as Milan.

Next, we split the number of mental health prescriptions into two subcategories of mental health medications, antidepressants and antipsychotics. Estimation results of model 1 with outcomes being replaced by the number of antidepressant prescriptions and antipsychotic prescriptions are presented in columns (4) and (5) of Table 6. The Great Recession has no significant effect on the antidepressant prescriptions for immigrant workers, native workers, or the whole sample, while its impacts on antipsychotic prescriptions are quantitatively similar to the baseline effects on mental health prescriptions. This is consistent with the previous evidence that the Great Recession did not increase the use of antidepressants (García et al., 2014).

Finally, we create four dummy variables indicating whether an individual receives any mental health prescriptions, receives any antidepressants, receives any antipsychotics, and is hospitalized due to mental health reasons in a year-quarter. Columns (6) to (9) of Table 6 report the impact of the Great Recession on these dummy variables. As shown in column (6), the Great Recession led to an increase in the proportion of individuals receiving mental health prescriptions, especially for native workers, although the coefficients are not statistically significant at the 10% level. This may be because dummy variables contain less information than the count variables. Similar to the results in columns (4) and (5), the Great Recession had no significant effect on the use of antidepressants, but increased the use of antipsychotics for native workers. Results in column (9) are also consistent with the baseline results, which show that the Great Recession had no significant effects on hospitalisation.

# 5 The Great Recession and Labour Market Outcomes

In the previous sections, we found that the Great Recession significantly increased mental health care utilisation among native workers, while its impact on immigrant workers was minor and statistically insignificant. This disparity leads to a crucial question: Why do immigrants not increase their mental health care use during economic crises? Is it because their labour market conditions are less or not affected by the Great Recession? Are immigrants more resilient, with mental health less susceptible to labour market shocks? Or, do they face greater barriers to accessing mental health care during times of economic downturn? For example, they may be disproportionately affected by mental health stigma, which could in turn reduce their likelihood of seeking care (Bharadwaj et al., 2017).

Another issue could relate to the financial constraints resulting from the economic crisis which may further limit immigrants' ability to obtain mental health support, particularly due to a perceived increase in the cost of medical services. We tend to rule out this hypothesis. In Italy when a general practitioner prescribes a medication that is part of the Prontuario Farmaceutico Nazionale (PFN), patients are typically required to pay a modest co-payment.[4] However, specific categories of patients-such as those with chronic conditions, individuals with disabilities, the elderly, or individuals with low income in specific employment-related conditions[5] are fully exempt from these co-payment requirements.[6]

By exploiting data on labour market conditions we can shed some light on the crucial question of why immigrants do not increase their use of mental health care during economic crises. We do so by examining the impact of the Great Recession on the employment outcomes of both immigrants and Italian workers. Few papers have addressed these questions using Italian data, mostly finding that migrants faced a similar level of penalization in the labour market after the crisis. Comparing similar native and immigrant workers using propensity score matching, Paggiaro (2013) concludes that there are no significant differences in the change of job separation rates during the Great Recession

[4]In Italy, the responsibility for organizing and managing health care services is largely decentralized, with regional authorities overseeing the delivery and regulation of care within their jurisdictions. However, the central government retains a coordinating role by setting nationwide minimum standards, monitoring regional compliance, and regulating pharmaceutical policy. This includes negotiating the inclusion, pricing, and specifications of medications listed in the Prontuario Farmaceutico Nazionale (PFN), the official national formulary. The PFN is administered by the National Health Service (Servizio Sanitario Nazionale, SSN).

[5]Individuals with a household income equal to or below €20,000 are entitled to exemptions for the duration of the following conditions: registered unemployed persons and their dependents; workers in mobility and their dependents; recipients of extraordinary or exceptional wage support (Cassa Integrazione Straordinaria or in deroga) and their dependents; and workers covered by so-called "defensive" solidarity contracts (effective from November 1, 2012) and their dependents. See `https://www.federfarma.it/Ticket-Regionali/Lombardia.aspx`

[6]For further information see `https://www.regione.lombardia.it/wps/portal/istituzionale/HP/DettaglioRedazionale/servizi-e-informazioni/cittadini/salute-e-prevenzione/prenotazioni-ticket-e-tempi-di-attesa/ticket-ed-esenzioni1/ticket-ed-esenzioni1`

between native and immigrant workers in Italy. Applying multinomial logistic regression models to employment transitions, Bonifazi and Marini (2014) show that the crisis affected Italians and foreigners similarly, and the penalization of foreigners with respect to natives did not change during the Great Recession, after controlling for compositional differences between immigrants and native workers. At a more disaggregated regional level, Ambrosini and Panichella (2016) note that only foreign males living in the Center-North experienced an increase in their disadvantage in employment opportunities compared to natives, while females were not affected, as the demand for unskilled labor due to domestic and care needs continued to rise during the Great Recession. Fellini (2018) compares the effects of the Great Recession on the immigrants' labour market performance in Italy and Spain, two countries that are similar in many respects. He finds that labour market outcomes worsened for both natives and immigrants in Italy and Spain. However, unlike Spain, immigrants in Italy did not experience significantly greater penalization in terms of unemployment rates after the crisis compared to natives, although they did face higher occupational segregation. This aligns with the findings by Venturini and Villosio (2018), who report positive growth in foreign employment during the recession in Italy, but also highlight increased segregation into low-skilled, unstable, and poorly paid jobs.

We now employ the strategy presented in Section 3 to study the impact of the Great Recession on individual labour market outcomes. Specifically, we estimate equation (1) using the following outcome variables $Y_{iat}$: i) the number of days employed in a year-quarter ii) a dummy variable indicating employment status during the quarter (1 if employed, 0 otherwise) iii) a dummy variable indicating whether a worker was unemployed in the current quarter but employed in the previous quarter (1 if yes, 0 otherwise)

The effects of the Great Recession on individual labour market outcomes are presented in Table 7. Panel A shows that, on average, workers living in areas hit harder by the Great Recession have fewer days in employment, are less likely to be defined as being employed, and are more likely to lose their jobs. When examining immigrant and native workers separately, we find that both groups are negatively affected by the crisis. Comparing panels B and C, the negative effects on the number of days in employment and the likelihood of being employed are more pronounced for native workers, but the difference is not statistically significant.[7] In contrast, immigrant workers are more likely to experience transitions from employment to unemployment if they live in areas where economic shocks are larger, thus suggesting more employment instability compared to natives. Overall our results show that both immigrants and native workers faced worse labour market outcomes in regions hit harder by the Great Recession, as already pointed out in the literature.

Table 8 shows the impacts of the Great Recession on labour market outcomes for sub-samples of low-skilled workers. Intuitively, low-skilled workers are more affected

[7]We tested whether the difference in the coefficients for migrants and natives is statistically different from zero using a fully interacted model. Results are available upon request.

by the crisis, and both migrants and natives are likely to be equally impacted. Table 9 examines the impacts of the Great Recession on labour market outcomes when we stratify the sample by citizenship and gender. For both immigrants and Italian workers, female workers are less affected by the economic crisis, regardless of the outcome variable. This is consistent with the literature, given that women are more likely to be employed in the service sector (e.g., Ambrosini and Panichella, 2016). These results may also explain the findings in Table 4, which show that male workers experience greater increases in mental health care utilisation compared to females. Then, we further divide the sample by age and the results are shown in Table 10. For immigrant female workers, immigrant male workers, and Italian female workers, the negative effects of the crisis on employment outcomes mainly concentrate on the middle-aged and older workers. No clear age-related pattern is found, however, for native male workers.

Regarding the heterogeneity by citizenship, the outcome-dependent pattern still exists in both Table 9 and 10.

To summarise, our labour market analysis suggests that both immigrant and native workers are negatively affected by the Great Recession. Also, immigrants are generally more likely to experience employment-to-unemployment transitions than Italian workers when they face a larger shock. Therefore, we can rule out the possibility that immigrants do not increase mental health care use because they are not affected in the labour market.

# 6 Conclusions

This paper examines the impact of the 2008 Great Recession on mental health care utilisation among migrant and native workers in the Lombardy region of Italy, by using unique administrative employment contract data matched with data on psychotropic drug prescriptions and hospitalisations for psychiatric disorders from 2007 to 2011. We consider the Great Recession as a shock that hit the economy with uneven effects across different areas, and employ a continuous difference-in-differences approach to estimate the causal effect of the severity of the Great Recession on health care use. We find that, on average, a one-percentage-point increase in the unemployment rate change between 2007 and 2009 leads to a 0.026 rise in the number of psychiatric prescriptions per worker per quarter following the crisis, while hospitalisations for psychiatric disorders remain unaffected. The rise in psychotropic drug use is concentrated among native workers, while immigrant workers, despite facing worse labour market conditions, did not exhibit a significant increase in mental health care utilisation when the local economy was more severely affected by the recession.

Despite its contributions, our study has some limitations. First, we find that immigrants do not significantly increase their mental health care utilisation in response to larger economic shocks, however the underlying reasons for this pattern remain unclear. Our labour market analysis rules out the possibility that immigrants were not affected

by the Great Recession with regard to their labour market outcomes; however, several alternative explanations exist. One possibility is that immigrants exhibit greater resilience to economic shocks, although, to our knowledge, there is scarce evidence to support this claim. For instance, (taking into consideration that our data refer to outcomes in the formal labour market) it is possible that migrants are more likely to adapt to the economic shock by switching from the formal to the informal labour market, as they are more often employed in routinized occupations. However, this possible motivation for under-utilisation does not appear much applicable to our case since Guriev et al. (2018) shows that less than 10% of immigrant workers who lost a formal job during the 2008 crisis moved to the informal sector in the Lombardy region. Another factor that could make migrants more resilient than natives is the density of their ethnic group in the area where they live. In fact, high ethnic density has been shown to be important in contributing to both lower frequency and lower persistence of psychiatric disorders (and thus lower utilization of mental health care services) (Bhugra and Arya, 2009; Spinogatti, 2015).

Mental health care under-utilisation by migrants could be also due to the fact that their relatively lower mental health literacy among immigrants may prevent them from recognizing the need for mental health care (see, for instance, Medina et al. (2022)). Moreover, immigrants may have less access to mental health care services due to language barriers, cultural barriers and stigmatization (Forray et al., 2024; Sarría-Santamera A, 2016). Additionally, the social stigma associated with mental health care may be exacerbated during economic crises, particularly for vulnerable groups like immigrants, who may fear job loss or reduced employment prospects if diagnosed with a mental health condition (Bharadwaj et al., 2017; Chen and Dagher, 2016; García et al., 2014). If this is true, policymakers should address barriers to mental health care for immigrants by reducing stigma, especially in marginalized groups, and improving mental health literacy. Unfortunately, due to data limitations, we are unable to directly test these hypotheses.

Given the scarcity of evidence on how economic crises affect mental health care utilisation among native and immigrant populations, future research could explore further the mechanisms driving the disparities between natives and immigrants. A deeper understanding of this issue would provide valuable insights into the economic and psychological challenges faced by immigrant populations during economic downturns and help inform policies aimed at building a more inclusive mental health care system.

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# Tables

Table 1: Summary Statistics for the Full Sample, Migrants, and Natives

| | Full sample | Migrants | Natives |
|---|---|---|---|
| **1. Individual characteristics** | | | |
| Age | 38.8978 | 37.0197 | 39.2997 |
| | (10.7243) | (9.3789) | (10.9494) |
| Gender (female = 1) | 0.4615 | 0.3569 | 0.4839 |
| | (0.4985) | (0.4791) | (0.4997) |
| Education: Elementary/Lower secondary | 0.5028 | 0.7947 | 0.4481 |
| | (0.5000) | (0.4039) | (0.4973) |
| Education: Upper secondary | 0.3947 | 0.1772 | 0.4354 |
| | (0.4888) | (0.3818) | (0.4958) |
| Education: Post-secondary | 0.1024 | 0.0281 | 0.1165 |
| | (0.3032) | (0.1654) | (0.3208) |
| **2. Mental health care** | | | |
| Number of prescriptions | 0.1118 | 0.0245 | 0.1304 |
| | (2.6662) | (1.1139) | (2.8877) |
| Number of hospitalizations | 0.0009 | 0.0004 | 0.0010 |
| | (0.0364) | (0.0246) | (0.0385) |
| Whether receiving prescriptions | 0.0220 | 0.0056 | 0.0255 |
| | (0.1466) | (0.0748) | (0.1575) |
| Whether being hospitalized | 0.0008 | 0.0004 | 0.0009 |
| | (0.0276) | (0.0187) | (0.0292) |
| **3. Labor market outcomes** | | | |
| Number of working days | 69.1223 | 63.1446 | 70.4092 |
| | (32.5306) | (34.5081) | (31.9426) |
| Whether being employed | 0.8357 | 0.7871 | 0.8461 |
| | (0.3706) | (0.4094) | (0.3608) |
| From employment to unemployment (yes=1) | 0.0529 | 0.0700 | 0.0498 |
| | (0.2239) | (0.2551) | (0.2176) |
| Observations | 42,725,842 | 7,537,586 | 35,113,164 |

*Notes:* This table shows the summary statistics for the full sample, migrants, and natives. Numbers are mean values and standard deviations are in the parenthesis.

Table 2: Effects of the Great Recession on mental health care utilisation among the full sample, immigrants, and native people

| Dep. Var. | Number of prescriptions (1) | Number of hospitalisations (2) |
|---|---|---|
| **Panel A: Full sample** | | |
| Shock * After 2008Q2 | 0.02593*** | 0.00008 |
| | (0.00872) | (0.00007) |
| *N* | 42,725,842 | 42,725,842 |
| No. of individuals | 2,244,254 | 2,244,254 |
| **Panel B: Migrants sample** | | |
| Shock * After 2008Q2 | 0.00637 | 0.00012 |
| | (0.00553) | (0.00014) |
| *N* | 7,537,586 | 7,537,586 |
| No. of individuals | 404,052 | 404,052 |
| **Panel C: Natives sample** | | |
| Shock * After 2008Q2 | 0.02891*** | 0.00007 |
| | (0.00978) | (0.00007) |
| *N* | 35,113,164 | 35,113,164 |
| No. of individuals | 1,836,201 | 1,836,201 |

*Notes:* This table shows the effect of the Great Recession on different types of mental health care utilization for the full sample, immigrants, and native people. People between 18 - 64 years old are included in each sample. Individual FEs, year-quarter FEs, and age FEs are controlled in all models. Standard errors clustered at the SLL level are in the parenthesis. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.1 levels respectively.

Table 3: Effects of economic crisis on mental health care of low-skilled workers

| Dep. Var. | Number of prescriptions (1) | Number of hospitalisations (2) |
|---|---|---|
| **Panel A: Full sample** | | |
| Shock * After 2008Q2 | 0.02560** | 0.00027** |
| | (0.00963) | (0.00010) |
| *N* | 20,347,580 | 20,347,580 |
| **Panel B: Migrants sample** | | |
| Shock * After 2008Q2 | 0.01006 | 0.00017 |
| | (0.00797) | (0.00019) |
| *N* | 5,104,043 | 5,104,043 |
| **Panel C: Natives sample** | | |
| Shock * After 2008Q2 | 0.03053*** | 0.00030*** |
| | (0.01105) | (0.00011) |
| *N* | 15,230,938 | 15,230,938 |

*Notes* This table shows the effect of the Great Recession on different types of mental health care utilization of low-skilled workers. People between 18 - 64 years old with primary or lower secondary education are included in the sample. Individual FEs, year-quarter FEs, and age FEs are controlled in all models. Standard errors clustered at the SLL level are in the parenthesis. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.1 levels respectively.

Table 4: Heterogeneous effects of the Great Recession on mental health care utilisation by citizenship and gender

| Dep. Var. | Number of prescriptions (1) | Number of hospitalisations (2) |
|---|---|---|
| **Panel A: Female migrants** | | |
| Shock * After 2008Q2 | −0.00091 | −0.00001 |
| | (0.00766) | (0.00018) |
| *N* | 2,690,191 | 2,690,191 |
| **Panel B: Male migrants** | | |
| Shock * After 2008Q2 | 0.00956 | 0.00018 |
| | (0.00861) | (0.00015) |
| *N* | 4,847,395 | 4,847,395 |
| **Panel C: Female natives** | | |
| Shock * After 2008Q2 | 0.02395*** | −0.00005 |
| | (0.00870) | (0.00013) |
| *N* | 16,992,591 | 16,992,591 |
| **Panel D: Male natives** | | |
| Shock * After 2008Q2 | 0.03308*** | 0.00019** |
| | (0.01209) | (0.00009) |
| *N* | 18,120,514 | 18,120,514 |

*Notes* This table shows the effect of the Great Recession on different types of mental health care utilization in different subsamples stratified by citizenship and gender. People between 18 - 64 years old are included in each subsample. Individual FEs, year-quarter FEs, and age FEs are controlled in all models. Standard errors clustered at the SLL level are in the parenthesis. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.1 levels respectively.

Table 5: Heterogeneous effects of the Great Recession on mental health care utilisation by citizenship, gender, and age

| Dep. Var. | Number of prescriptions | | Number of hospitalisations | |
|---|---|---|---|---|
| Subsample | Female (1) | Male (2) | Female (3) | Male (4) |
| **Panel A: Migrants, 18-35 years old** | | | | |
| Shock * After 2008Q2 | −0.00014 | 0.00853 | −0.00004 | 0.00012 |
| | (0.00480) | (0.01189) | (0.00026) | (0.00014) |
| *N* | 1,420,216 | 2,729,497 | 1,420,216 | 2,729,497 |
| **Panel B: Migrants, 35-50 years old** | | | | |
| Shock * After 2008Q2 | −0.00406 | 0.01316 | 0.00021 | 0.00030 |
| | (0.01924) | (0.01000) | (0.00038) | (0.00027) |
| *N* | 990,494 | 1,819,163 | 990,494 | 1,819,163 |
| **Panel C: Migrants, 50+ years old** | | | | |
| Shock * After 2008Q2 | 0.00581 | −0.00225 | −0.00066 | 0.00001 |
| | (0.00858) | (0.00652) | (0.00054) | (0.00029) |
| *N* | 279,481 | 298,735 | 279,481 | 298,735 |
| **Panel D: Natives, 18-35 years old** | | | | |
| Shock * After 2008Q2 | 0.02155*** | 0.03820*** | 0.00004 | 0.00016 |
| | (0.00668) | (0.01098) | (0.00016) | (0.00013) |
| *N* | 8,382,482 | 8,453,302 | 8,382,482 | 8,453,302 |
| **Panel E: Natives, 35-50 years old** | | | | |
| Shock * After 2008Q2 | 0.03100* | 0.04289* | −0.00007 | 0.00018 |
| | (0.01757) | (0.02174) | (0.00021) | (0.00014) |
| *N* | 6,159,527 | 6,120,006 | 6,159,527 | 6,120,006 |
| **Panel F: Natives, 50+ years old** | | | | |
| Shock * After 2008Q2 | 0.01209 | 0.00577 | −0.00030 | 0.00025 |
| | (0.01413) | (0.01135) | (0.00026) | (0.00022) |
| *N* | 2,450,582 | 3,547,206 | 2,450,582 | 3,547,206 |

*Notes* This table shows the effect of the Great Recession on different types of mental health care utilization in different subsamples stratified by citizenship, gender, and age. People between 18 - 64 years old are included in each subsample. Individual FEs, year-quarter FEs, and age FEs are controlled in all models. Standard errors clustered at the SLL level are in the parenthesis. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.1 levels respectively.

Table 6: Robustness Checks

| Outcome | Prescription (99% capped) | Prescription (exclude Milan) | Hospitalisation (exclude Milan) | Anti-depressants | Anti-psychotics | Prescription (dummy) | Anti-depressants (dummy) | Anti-psychotics (dummy) | Hospitalisation (dummy) |
|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| **Panel A: Full sample** | | | | | | | | | |
| Shock * | 0.03962*** | 0.02843*** | 0.00006 | 0.00047 | 0.02546*** | 0.00036 | −0.00010 | 0.00059** | 0.00004 |
| After 2008Q2 | (0.01376) | (0.00874) | (0.00007) | (0.00133) | (0.00849) | (0.00042) | (0.00033) | (0.00022) | (0.00006) |
| *N* | 42725842 | 25380561 | 25380561 | 42725842 | 42725842 | 42725842 | 42725842 | 42725842 | 42725842 |
| **Panel B: Immigrant sample** | | | | | | | | | |
| Shock * | 0.00569 | 0.00833 | 0.00010 | −0.00127 | 0.00764 | 0.00014 | −0.00015 | 0.00029 | 0.00012 |
| After 2008Q2 | (0.00757) | (0.00644) | (0.00015) | (0.00107) | (0.00532) | (0.00032) | (0.00029) | (0.00019) | (0.00012) |
| *N* | 7,537,586 | 4,291,330 | 4,291,330 | 7,537,586 | 7,537,586 | 7,537,586 | 7,537,586 | 7,537,586 | 7,537,586 |
| **Panel C: Native sample** | | | | | | | | | |
| Shock * | 0.04511*** | 0.03115*** | 0.00006 | 0.00037 | 0.02854*** | 0.00030 | −0.00019 | 0.00063** | 0.00003 |
| After 2008Q2 | (0.01563) | (0.00983) | (0.00007) | (0.00155) | (0.00957) | (0.00051) | (0.00039) | (0.00025) | (0.00006) |
| *N* | 35113164 | 21029129 | 21029129 | 35113164 | 35113164 | 35113164 | 35113164 | 35113164 | 35113164 |

*Notes* This table shows the effect of the Great Recession on mental health care use. People between 18 - 64 years old are included in the sample. Individual FEs, year-quarter FEs, and age fixed effects are controlled in all regressions. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.1 levels respectively. Standard errors are clustered at the the SLL level.

Table 7: Effects of the Great Recession on labor market outcomes among the full sample, immigrants, and native people

| Dep. Var. | Number of days in employment | Whether being employed | Transition from employment to unemployment |
|---|---|---|---|
| | (1) | (2) | (3) |
| **Panel A: Full sample** | | | |
| Shock * After 2008Q2 | −2.91209*** | −0.03795*** | 0.01287** |
| | (0.79503) | (0.01004) | (0.00484) |
| *N* | 42,725,842 | 42,725,842 | 30414817 |
| **Panel B: Migrants sample** | | | |
| Shock * After 2008Q2 | −1.79844 | −0.02773* | 0.03436*** |
| | (1.45677) | (0.01495) | (0.00994) |
| *N* | 7,537,586 | 7,537,586 | 4,666,780 |
| **Panel C: Natives sample** | | | |
| Shock * After 2008Q2 | −3.16078*** | −0.04011*** | 0.01043** |
| | (0.90317) | (0.01153) | (0.00452) |
| *N* | 35,113,164 | 35,113,164 | 25698732 |

*Notes* This table shows the effect of the Great Recession on labor market outcomes for the full sample, immigrants, and native people. People between 18 - 64 years old are included in each sample. Individual FEs, year-quarter FEs, and age FEs are controlled in all models. Standard errors clustered at the SLL level are in the parenthesis. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.1 levels respectively.

Table 8: Effects of economic crisis on labour market outcomes of low-skilled workers

| Dep. Var. | Number of days in employment | Whether being employed | Transition from employment to unemployment |
|---|---|---|---|
| | (1) | (2) | (3) |
| **Panel A: Full sample** | | | |
| Shock * After 2008Q2 | −3.20840*** | −0.04225*** | 0.01951* |
| | (1.18823) | (0.01426) | (0.01081) |
| *N* | 20,347,580 | 20,347,580 | 13,841,812 |
| **Panel B: Migrants sample** | | | |
| Shock * After 2008Q2 | 0.57101 | −0.00566 | 0.01650** |
| | (1.49159) | (0.01542) | (0.00669) |
| *N* | 5,104,043 | 5,104,043 | 2,829,047 |
| **Panel C: Natives sample** | | | |
| Shock * After 2008Q2 | −4.08201** | −0.05029*** | 0.01831* |
| | (1.59391) | (0.01863) | (0.00979) |
| *N* | 15,230,938 | 15,230,938 | 11,004,085 |

*Notes* This table shows the effect of the Great Recession on different types of mental health care utilization of low-skilled workers. People between 18 - 64 years old with primary or lower secondary education are included in the sample. Individual FEs, year-quarter FEs, and age FEs are controlled in all models. Standard errors clustered at the SLL level are in the parenthesis. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.1 levels respectively.

Table 9: Heterogeneous effects of the Great Recession on labor market outcomes by citizenship and gender

| Dep. Var. | Number of days in employment | Whether being employed | Transition from employment to unemployment |
|---|---|---|---|
| | (1) | (2) | (3) |
| **Panel A: Female migrants** | | | |
| Shock * After 2008Q2 | −1.64290 | −0.02738* | 0.02198*** |
| | (1.58240) | (0.01526) | (0.00817) |
| *N* | 2,690,191 | 2,690,191 | 1,663,705 |
| **Panel B: Male migrants** | | | |
| Shock * After 2008Q2 | −2.56294* | −0.03590** | 0.03658*** |
| | (1.29582) | (0.01406) | (0.01003) |
| *N* | 4,847,395 | 4,847,395 | 3,003,075 |
| **Panel C: Female natives** | | | |
| Shock * After 2008Q2 | −2.82630*** | −0.03797*** | 0.00370 |
| | (0.75170) | (0.01027) | (0.00429) |
| *N* | 16992591 | 16992591 | 12389112 |
| **Panel D: Male natives** | | | |
| Shock * After 2008Q2 | −3.54204*** | −0.04254*** | 0.01514** |
| | (1.15804) | (0.01354) | (0.00568) |
| *N* | 18120514 | 18120514 | 13309565 |

*Notes* This table shows the effect of the Great Recession on labor market outcomes in different subsamples stratified by citizenship and gender. People between 18 - 64 years old are included in each subsample. Individual FEs, year-quarter FEs, and age FEs are controlled in all models. Standard errors clustered at the SLL level are in the parenthesis. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.1 levels respectively.

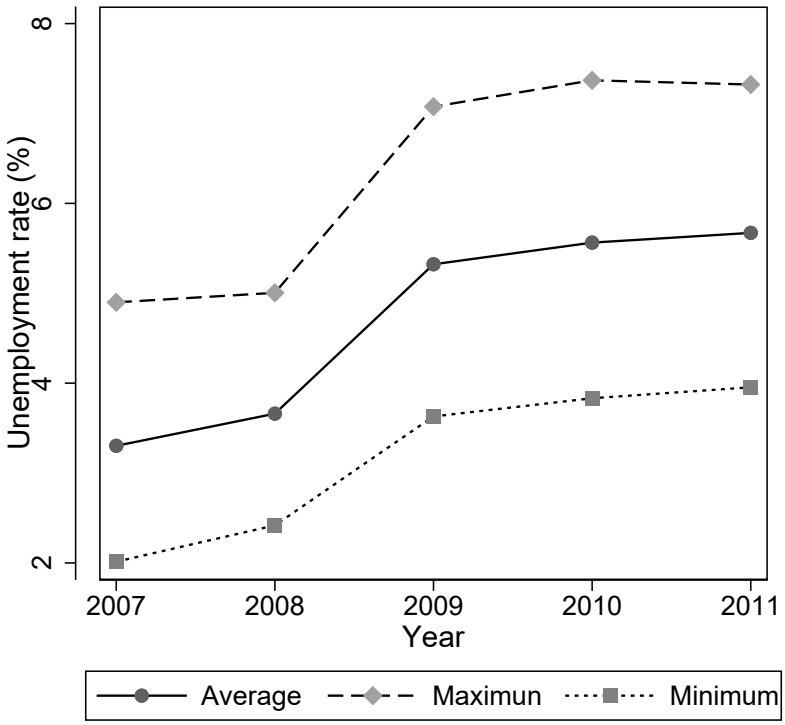
Table 10: Heterogeneous effects of the Great Recession on labor market outcomes by citizenship, gender, and age

| Dep. Var. | Number of days in employment | | Whether being employed | | Transition from employment to unemployment | |
|---|---|---|---|---|---|---|
| Subsample | Female | Male | Female | Male | Female | Male |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| **Panel A: Migrants, 18-35 years old** | | | | | | |
| Shock * After 2008Q2 | −1.25766 | −1.58509 | −0.01863 | −0.02390* | 0.01626** | 0.03023*** |
| | (1.78703) | (1.08239) | (0.01786) | (0.01213) | (0.00751) | (0.00855) |
| $N$ | 1,420,216 | 2,729,497 | 1,420,216 | 2,729,497 | 828,326 | 1,600,805 |
| **Panel B: Migrants, 35-50 years old** | | | | | | |
| Shock * After 2008Q2 | −1.93374 | −3.81971** | −0.03742** | −0.05186*** | 0.02808*** | 0.04264*** |
| | (1.52079) | (1.62980) | (0.01521) | (0.01740) | (0.00845) | (0.01215) |
| $N$ | 990,494 | 1,819,163 | 990,494 | 1,819,163 | 653,777 | 1,202,472 |
| **Panel C: Migrants, 50+ years old** | | | | | | |
| Shock * After 2008Q2 | −2.66660 | −4.02969* | −0.03994* | −0.05178* | 0.03141** | 0.05139*** |
| | (2.00801) | (2.40084) | (0.02071) | (0.02597) | (0.01504) | (0.01364) |
| $N$ | 279,481 | 298,735 | 279,481 | 298,735 | 181,602 | 199,798 |
| **Panel D: Natives, 18-35 years old** | | | | | | |
| Shock * After 2008Q2 | −1.30023** | −3.18247** | −0.02018*** | −0.03832** | 0.00692 | 0.01714** |
| | (0.52307) | (1.25760) | (0.00743) | (0.01463) | (0.00531) | (0.00697) |
| $N$ | 8,382,482 | 8,453,302 | 8,382,482 | 8,453,302 | 5,932,872 | 6,046,908 |
| **Panel E: Natives, 35-50 years old** | | | | | | |
| Shock * After 2008Q2 | −3.10825*** | −4.26070*** | −0.04112*** | −0.05024*** | −0.00184 | 0.01488*** |
| | (0.82127) | (1.19368) | (0.01099) | (0.01394) | (0.00461) | (0.00524) |
| $N$ | 6,159,527 | 6,120,006 | 6,159,527 | 6,120,006 | 4,728,204 | 4,783,845 |
| **Panel F: Natives, 50+ years old** | | | | | | |
| Shock * After 2008Q2 | −7.36713*** | −3.24272** | −0.09147*** | −0.04003** | 0.00893* | 0.01247** |
| | (2.10063) | (1.55121) | (0.02654) | (0.01798) | (0.00487) | (0.00583) |
| $N$ | 2,450,582 | 3,547,206 | 2,450,582 | 3,547,206 | 1,728,036 | 2,478,812 |

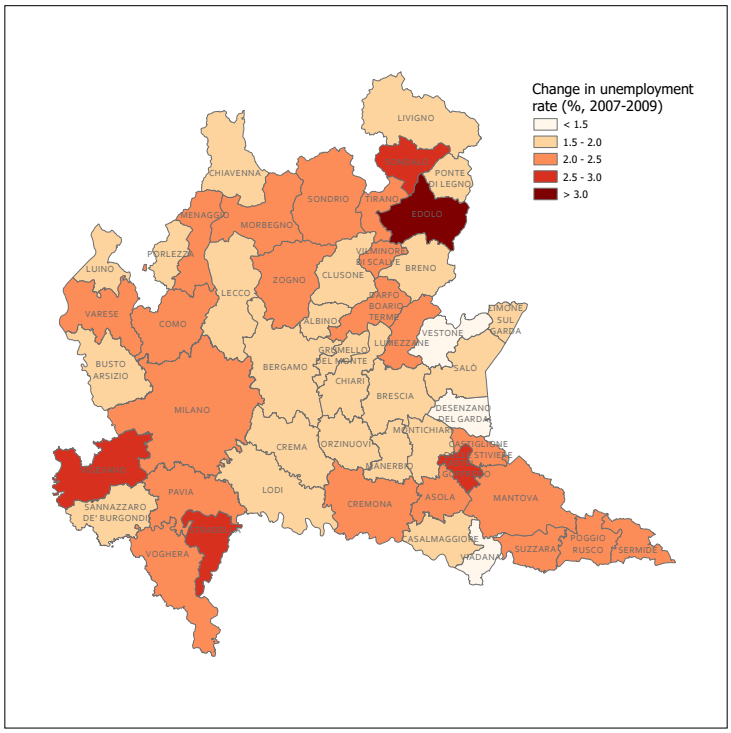
*Notes* This table shows the effect of the Great Recession on labor market outcomes in different subsamples stratified by citizenship, gender, and age. People between 18 - 64 years old are included in each subsample. Individual FEs, year-quarter FEs, and age FEs are controlled in all models. Standard errors clustered at the SLL level are in the parenthesis. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.1 levels respectively.

# Figures

Figure 1: Unemployment rate and change in unemployment rate in SLLs in Lombardy



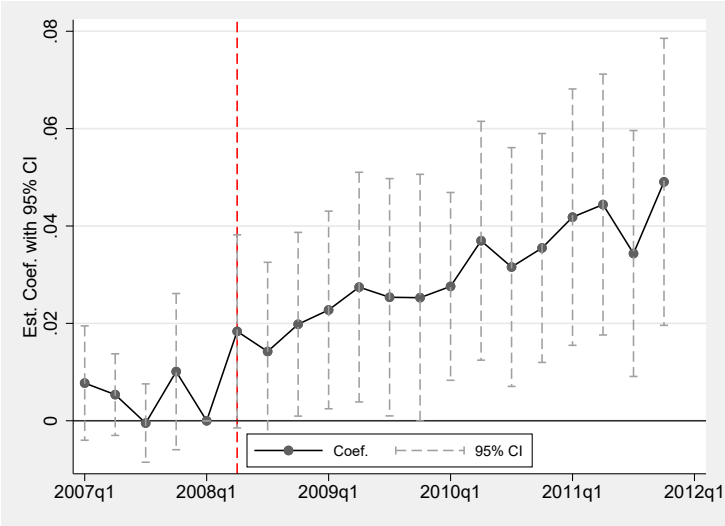

(a) Minimum, Average, and Maximum SLL Unemployment Rates in Lombardy (2007–2011)



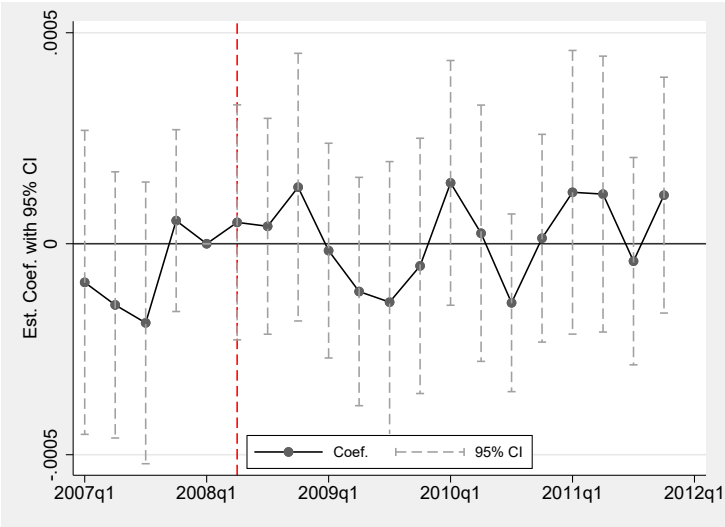

(b) Changes in unemployment rate during 2007 - 2009 in all SLLs in Lombardy

*Notes:* The subfigure (a) shows the minimum, average, and maximum SLL unemployment rate in Lombardy, Italy, from 2007 to 2011. The map (b) displays the changes in unemployment rate from 2007 to 2009 in all SLLs in Lombardy, Italy. Data source: ISTAT.

Figure 2: Impact of the Great Recession on mental health care




(a) Number of prescriptions

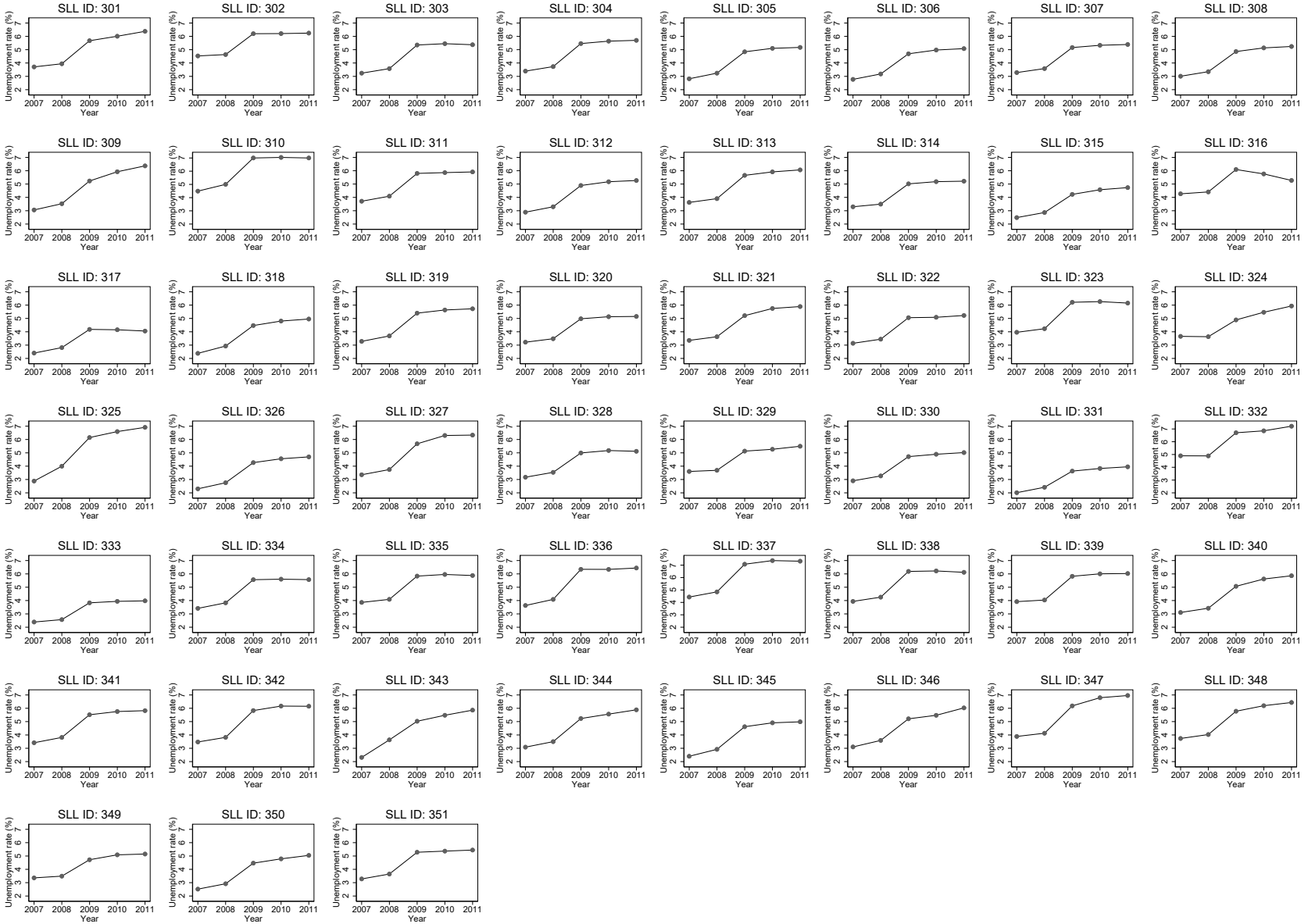



(b) Number of hospitalisations

*Notes:* This figure displays the quarterly coefficients $\beta_t$'s from equation (2), where the outcome variables are number of prescriptions (subfigure (a)) and number of hospitalisations (subfigure (b)). Grey dashed lines represent the 95% confidence intervals of the coefficients. The red dashed line indicates the start of the Great Recession in Italy. Standard errors are clustered at the SLL level.

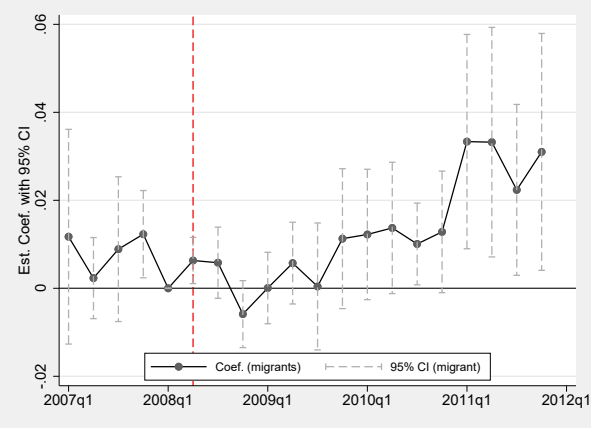
# A Appendix

Figure A.1: Unemployment Rate Trends at the SLL Level in Lombardy (2006–2019)

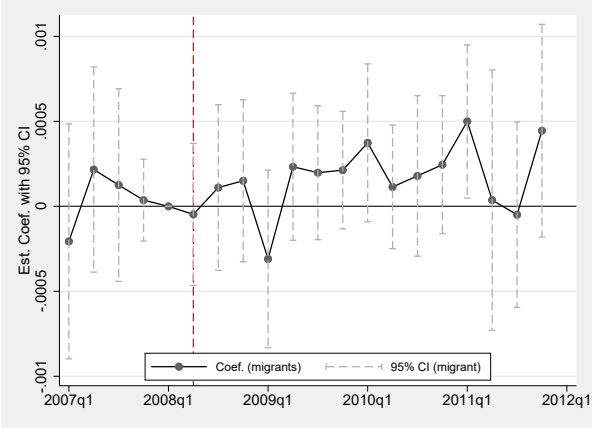



*Notes:* This figure shows the evolution of the unemployment rate in all SLLs in the Lombardy region between 2006 and 2011. SLL IDs are displayed at the top of each subfigure. Data source: ISTAT.

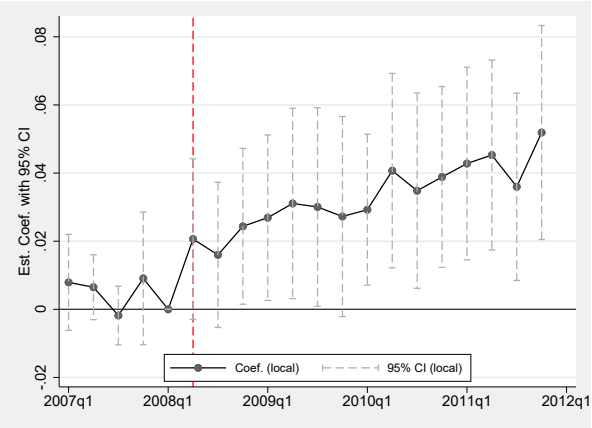
Figure A.2: Impact of the Great Recession on mental health care of immigrants and natives



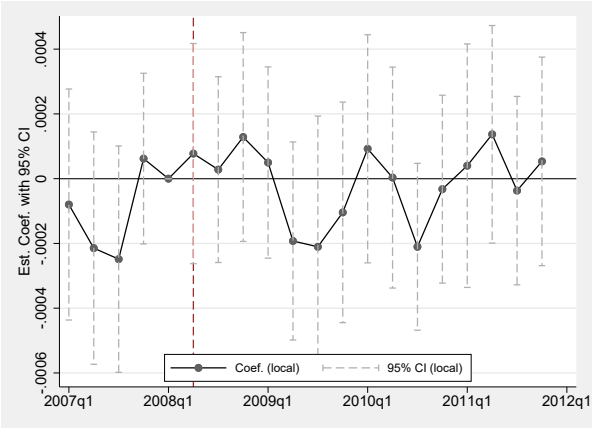

(a) Number of prescriptions, immigrants




(b) Number of hospitalisations, immigrants




(c) Number of prescriptions, natives




(d) Number of hospitalisations, natives

*Notes:* This figure displays the quarterly coefficients $\beta_t$'s from equation (2) for immigrant sample (subfigures (a) and (b)) and native sample (subfigures (c) and (d)). The outcome variables are the number of prescriptions (subfigure (a) and (c)) and the number of hospitalisations (subfigure (b) and (d)). Grey dashed lines represent the 95% confidence intervals of the coefficients. The red dashed line indicates the start of the Great Recession in Italy. Standard errors are clustered at the SLL level.