THE IMPACT OF SHORT-TERM EXOGENOUS SHOCKS ON LOCAL LABOUR MARKETS:

AN EMPIRICAL EXERCISE FOR ITALY (2006-2021)

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Abstract

In this paper, we investigate the spatial regime and the short-term changes following both activity and unemployment rates. These rates are taken as proxies of the functioning of 610 local job markets in Italy as reflected in the homogeneous districts delineated by Italian National Statistical Institute and called 'Sistemi Locali del Lavoro'. The time horizon spans over a relatively long time period (2006-2021) encompassing the long economic crisis (2007-2013), a period of economic stagnation or moderate recovery (2014-2019) and the Covid-19 time (2020-2021). Based on a purely exploratory approach, the empirical analysis has identified the socioeconomic factors more effectively characterizing the job market dynamics.

Keywords: Unemployment rate, Territorial disparities, Economic downturns, Southern Europe.

1. INTRODUCTION

In recent times, global processes of change underpinning socio-demographic phenomena have been the subject of intense debates in regional science and applied economics (Martin and Sunley, 2015). Changes impacting local job

markets have demonstrated to consolidate employment disparities over space and affect the distribution of wealth and income across countries and regions (Rodríguez-Pose, 2013). These issues, indeed, revealed as crucial topics in understanding business cycles, industrial restructuring, and spatial relocation of advanced services (Goldblum and Wong, 2000; Winarso and Firman, 2002; Wilkinson and Pickett, 2009). Moreover, regional disparities in employment levels still represent a challenging concern for policy makers in many advanced economies (Veneri, 2010). Following Tselios et al., (2012), 'entrenched and persistent spatial disparities' cannot be neglected for their impacts on both the 'economic geography thinking', and the economic history of countries all over the world. In European Union, the 2007 crisis has affected almost all countries, impairing peripheral regions especially in the Mediterranean basin (Salvati et al., 2017). The main consequences of the great recession in Europe have been reflected in rising spatial disparities, income inequality, and a more polarized distribution of businesses (Pérez, 2010; Piketty, 2014; Ren, 2015). Specifically, as discussed in Cuadrado-Roura et al. (2016), spatial disparities and structural differences in economic production can result in different (often place-specific) reactions to external shocks, possibly undermining the existence of monetary unions. Scholars provided evidence on the role of regional inequalities in political instability and armed conflicts (e.g. Ezcurra and Rios, 2019; Lessmann et al., 2015; Østby et al., 2009). Among others, Stiglitz (2016) raised ethical and economic arguments in favour of a more equitable world, providing the same opportunities to people regardless to their nationality. According to Rodríguez-Pose (2018), persistent inequalities have drawn increased attention for their potential role in the rise of the 'places that don't matter' in the post-Trump and post-Brexit era. In the long-term, the outcomes of divergent regional economic trajectories affected the election results, thus leading to the emergence of a 'geography of discontent' (Dijkstra et al., 2019; Los et al., 2017; Rodríguez-Pose, 2020). Based on these premises, the focus on the main mechanisms of local development and socioeconomic change should be of crucial relevance when dealing with studies in regional science and economic geography (Storper, 2011). Recessions have widely impacted social cohesion, either directly or indirectly, causing poverty, unemployment, social inequities, and conflicts over physical resources (Bathelt and Boggs, 2003). Specifically, social segregation and polarization in wealthy and depressed areas (Massari et al., 2009), as well as other intricate, complex and multifaceted local

transformations, significantly affected economic development (Whelan et al., 2015). Nevertheless, crisis-driven socioeconomic changes should provide renewed prospects for local development (e.g. Storper, 1997). Recent studies on the relationship between economic cycles and regional disparities in both income and employment levels have delineated some internal and external factors shaping local systems (UNDP, 2022). Processes of spatial agglomeration and dispersion have been also monitored for their intrinsic role in socioeconomic development (Belussi and Gottardi, 2000; Patacchini, 2008; Salvati, 2016; Lan et al., 2019). The notion of 'spatially balanced growth' has thus become a 'political hymn' in emerging markets as well as in certain advanced economies (Garcia, 2010; Schneider et al., 2010; Rodríguez-Pose, 2012). Local development results from broad, uniform industrialization processes across time, and from spatially balanced population dynamics and economic activity growth and change (Storper, 2011; Kruse et al., 2023). Moreover, the basic mechanisms generating socioeconomic disparities at different spatial scales have been investigated in earlier studies assessing the intrinsic relationship between structure and performance of labour markets (Urso et al., 2019). The economic performance of local job markets can be addressed using refined, and spatially disaggregated, statistical indicators (Mauro, 2004). Among others, change in employment levels over time was assumed as an implicit measure of resistance to economic crises and post-shock recovery (Martin, 2016). Based on these premises, regional science has undertaken enriched explanations of the evolving geography of income and wealth (e.g. Gonzales, 2011). In this perspective, the experience of affluent but largely divided countries in Europe can help elucidating the mechanisms underlying the spatial division of labour (Haggett, 2001). Southern European countries display several, and possibly kaleidoscopic, examples of such dynamics (Dunford, 2008). For instance, Italy has recently shown a regionally unequal development embedded in its historical roots (Dunford, 2002; Daniele and Malanima, 2007; Salvati and Carlucci, 2016). In particular, the economic systems of Northern and Central Italy benefited from agglomeration economies, a high rate of innovation, and improved accessibility (Glaeser et al., 1992; Henderson et al., 1995; Boschma and Iammarino, 2009). These regions play a significant role in the economic structure of the country thanks to a strong relationship between agglomeration and vertical integration, a mix of competition and collaboration, trust relationships over formal contracts, and the

effectiveness of existing production systems (Dow et al., 2012; Cainelli and Iacobucci, 2012; Tridico, 2015). According to Salvati et al. (2017), local unemployment statistics in Italy highlight such kind of spatial divides. Nevertheless, before the 2007 recession, a labour market reform, codified in the 'Legge Biagi' (Italian Law no. 30/2003) and in the 'Pacchetto Treu' (Italian Law no. 196/1997), brought about changes to the highly regulated Italian labour market and increased local competition (Mauro, 2004). Further studies on regional job markets in Italy highlight potential losses of relevant opportunities in territorial interactions, for a more effective coordination of innovation policies within each of the two major innovation (sub)systems of Northern and Southern Italy (Gonzales, 2011). Within this context, a quantitative examination of administrative borders carried out for historical and demographic reasons relies on a critical analysis of their functionality for innovation (Leydesdorff and Leydesdorff, 2021). Based on these premises, tour study investigates whether the 2007 recession (and, more recently, the Covid-19 shock) has shaped new geographies of local job markets, reflected in short-term unemployment dynamics at the level of local labour market areas (LLMAs) in Italy. Assuming the indicators of labour market performances (e.g. unemployment rates) as a valid proxy of the functioning of regional job markets (Salvati et al., 2017), results of the analysis provided indirect evidence on the effect of institutional changes on the spatially varying performance of local labour markets to short-term economic shocks (Boschma and Iammarino, 2009). The study identified basic factors influencing the spatio-temporal dynamics of job markets in Italy, by compiling a database with socioeconomic and territorial indicators (e.g. Zambon et al., 2019). Spatial divides in the functioning of local job markets were investigated focusing on changes in unemployment rate between 2006 and 2021, a time period reflecting one of the most severe unemployment crisis since 1977 (Urso et al., 2019).

The article is organized as follows. Section 2 is devoted to the methodology adopted in the study. Results are shown in Section 3 and further discussed in some problematic aspects (Section 4). Section 5 finally drew some conclusions after having briefly discussed the most relevant findings of the study in a regional science perspective.

2. METHODOLOGY
2.1 STUDY AREA

Italy is a Mediterranean country covering 302,070 km^2 of which 23% are lowlands, 42% uplands and 35% mountainous areas (Dunford, 2002). Spatial divides in Italy exert a wide-range impact on metropolitan structures and socioeconomic processes at different geographical scales (Bonavero et al., 1999). The economic gap between Northern-Central and Southern regions (including the two main islands, Sicily and Sardinia) reflects the long-established industry-service dichotomy still existing in this country (Daniele and Malanima, 2007). Northern Italy includes the large, accessible flat area corresponding with the Po basin valley (Dunford, 2008). The mountain range of the Apennines separates Northern Italy from Central Italy, a polarized area in urban and rural districts and a diversified economic structure centred on small-scale manufacturing, tourism, and high-quality agricultural productions (Patacchini, 2008). Finally, Southern Italy is a marginal and economically disadvantaged context with younger population, and a productive structure centred on low-income agriculture and traditional tertiary activities (e.g. commerce) concentrated in the main cities (Mauro, 2004).

2.2 THE ISSUE OF DATA AVAILABILITY

Over the last few decades, official statistics have become more important in economies and societies, and their position as the most reliable source of information has been increasingly put to the challenge (European Commission, 2020). The increasing demand for statistical data is in line with the recommendation of the 2030 agenda on Sustainable Development - demanding hundreds of indicators designed in coherence with the fundamental principles of official statistics and human rights (United Nations, 2015). A fundamental part of official statistics is grounded on labour statistics (Patacchini, 2008). These statistics describe both micro- and macro-dimensions and all the economic actors (individuals, enterprises and public sector), detailing the labour market framework as well as its socioeconomic context (Salvati et al., 2017). Labour statistics enable the design of policy measures dealing with the main issues connected to job markets (Wulfgramm, 2014). The specific reference to International Standards of labour statistics allows the international

comparability of data and methodological coherence, proved to be crucial in the collection of reliable data (Istat, 2015). Shifting to the local dimension, the design of indicators to monitor progress under geographical and territorial aspects relies, especially for European countries, on census and administrative registers (Magrini et al., 2015). Unfortunately, gathering this kind of data is very time- and money-consuming, which makes it difficult to create a comprehensive database for precise estimations (Chieppa and Panizon, 2001). The Europe 2020 strategy addresses the issue of enhancing the territorial dimension in official statistics (Franconi et al., 2017). In the European cohesion policy, the chosen geography reflects the inherent structure of the socioeconomic reality (Schneider et al., 2010). Within this context, local labour market areas (LLMAs) are defined as functional regions whose main distinctive trait is self-containment (Smart, 1974), stemming from the aggregation of elementary geographical units (municipalities, economic districts, census tracks) on the basis of their level of spatial interaction measured by commuting to workflows (Ichim et al., 2017).

2.3. DATA DESCRIPTION AND BACKGROUND VARIABLES

To explore the local job market in periods of economic expansion and recession, variables covering socio-demographic and economic aspects were tested for their impact on labour dynamics in Italy (Salvati et al., 2017). Contextual indicators fixed over time (namely, structural characteristics of each area) were calculated at the local district scale (Table 1) from a database of official statistics released by Istat. The spatial scale adopted in this study relies on 610 LLMAs identified by Istat on the base of commuting data collected in the 2011 National Census of Population. LLMAs have extensively been used as relevant spatial units to analyse regional development of Italy (Pellegrini, 2002), specialization in the primary sector (Giusti and Grassini, 2007), and the impact of land quality on economic development (Salvati et al., 2014). The unemployment rate (DIS) has been adopted as a key indicator of job market performances (Salvati et al., 2017). The annual value of the three indicators has been retrieved, for the time period between 2006 and 2021, in the Istat labour force survey. Participation rate (ATT) is the ratio of total workforce (employed and unemployed) to the total resident population in working age (> 14 years and < 74 years) at any year considered. Employment rate (OCC) is calculated as the percentage of workers in total resident population. Unemployment rate

indicates the ratio of population actively searching for a job to the total workforce.

Table 1: Variables adopted in this study to assess the background socioeconomic context of local labour markets in Italy, using economic districts as the elementary spatial unit

Acron.	Variable	Source
Dis	Unemployment rate, gross	ISTAT, Labour Force survey
Occ	Employment rate, gross	
Att	Participation rate, gross	
Sud	A dummy indicating Southern districts in Italy (= 1)	ISTAT, Territorial statistics
Tur	Tourism specialized districts (dummy	ISTAT, statistics on LLSs
Mad	Made-in-Italy districts (dummy = 1)	
Dit	Industrial district (dummy = 1)	
Agr	Agricultural district (dummy = 1)	
Des	Non-specialized district (dummy = 1)	
Urb	Urban district (dummy = 1)	
Com	Number of municipalities per district	ISTAT, territorial statistics
Are	Area (km^2) of local district	ISTAT, population register and census

As highlighted in Table 1, the spatial dimension has been preliminary introduced through a dummy variable (SUD) that classifies the Southern Italian districts with the numerical code '1' ('0' otherwise). Six dummy variables, when equal to 1, have qualified the specialisation of each district under scrutiny (Salvati and Carlucci, 2016). Namely, TUR indicates tourism-specialised districts, MAD delineates the specialization in 'Made in Italy' industries, DIT and AGR respectively define the industrial and agricultural districts, while DES refers to unspecialised districts. Finally, URB qualifies the urban districts. Data on the logarithm of the number of municipalities per district, COM, have been retrieved from the Istat database of territorial statistics dated 2022, while the

information on the extension of the area of each district (km²) was retrieved from Istat population register and decadal censuses (Patacchini, 2008). Given the complexity of Italian local contexts, the selected indicators provide an overview of socio-demographic characteristics and the economic structure typical of each LLMAs (Salvati et al., 2017).

2.4. STATISTICAL ANALYSIS

An exploratory framework based on descriptive and multivariate statistics was adopted in this study (Zambon et al., 2017). This approach allows evaluating the role of variables supposed to be directly or indirectly correlated with job market dynamics, emphasising latent conditions of regional disparities in Italy (Masini et al., 2019). Similar approaches have been used in earlier studies focusing on the resilience of local economic systems (Salvati et al., 2017). The selected indicators have been earlier adopted in several regional studies (e.g. Soares et al., 2003; Del Campo et al., 2008; Salvati et al., 2014), especially focusing on unemployment differentials (Faini et al., 1997; Cracolici et al., 2007; Dallara and Rizzi, 2012). Changes in labour market performances between northern and southern Italian regions have been quantified considering the intrinsic variability of unemployment rates over time (Dunford, 2008). The methodological part, therefore, develops in two different steps. The first phase consists of a comparative analysis of descriptive statistics (Table 2). A principal component analysis was later run with the aim at refining and summarizing the results of descriptive statistics, better contextualizing the outcomes to the local socioeconomic background through the use of specific indicators for each district and year. Components with eigenvalues > 1 were retained and analysed using graphs plotting loadings (rows: years) and scores (columns: descriptive statistics) within the same factorial plane. A minimum spanning tree algorithm was used to delineate the most representative time sequence within the observation years. In a second exercise, a PCA was run on a data matrix whose rows report the values of the twelve indicators of Table 1 for each of the 610 Italian labour systems at the beginning (2006) and the end (2021) of the study period.

Table 1: Descriptive statistics adopted in this study

Variable	Gross unemployment rate for each of the 610 local labour system in Italy
Minimum	Minimum value of the spatial series at each year
Maximum	Maximum value of the spatial series at each year
Mean	Average value of the variable at each year
Normalized	Normalized range [(max-min)/mean] of the variable at each year
Median	Median value of the variable at each year
Median/mean	Median-to-mean ratio of the variable at each year
75pc-	Interquartile range over the median ratio of the variable at each
Kurtosis	Kurtosis of the variable's distribution at each year
Asymmetry	Asymmetry of the variable's distribution at each year
Coeff.Variation	Coefficient of variation of the variable at each year
North/South	Ratio between the values of the variable in northern and southern districts
North-South	Diff. between the aggregated values of the variable in northern and southern districts at each year

Components with eigenvalues > 1 were retained and analysed using graphs plotting loadings (rows: background indicators) and scores (columns: local labour systems) within the same factorial plane.

3. RESULTS

3.1. THE STATISTICAL DISTRIBUTION OF LOCAL UNEMPLOYMENT RATES IN ITALY

Gross unemployment rate includes all job types, e.g. both fixed-term employment and precarious work, but, as a crude rate, it does not consider the peculiarities of each job type. Considering the detailed spatial scale adopted, quarterly statistics are not accessible at the local level, and thus the analysis was based on annual data. Table 3 reports selected descriptive statistics of gross unemployment rate computed for each of the 610 local labour systems in Italy between 2006 and 2021. The time period under scrutiny corresponds with the end of the most recent economic expansion (basically, 2006), being connected to the sovereign debt crisis, particularly in Mediterranean countries. It also covered the Lehmann Brothers crisis' time, since 2007. In that year, Italy reached its highest peak of employment and occupation and its lowest rate of

unemployment (around 6%). This scenario is fostered by labour market flexibility measures and the creation of temporary job seats, affecting both male and female employment. Since 2007, gross unemployment rates increased because of the economic crisis culminated in the beginning of the 2010s. These years featured notable political instability in Greece, an increasing public debt in Spain, and debt overexposure in Portugal. Within the Italian context, the relevant political instability has been also complemented by a differential of 500 points between Italian bond and German Bunds. This circumstance caused a further increase in unemployment rates, reaching the maximum value in 2013, being recovered partially in the subsequent years.

Table 1: Descriptive statistics adopted in this study

Variable	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Minimum	1.4	1.4	1.8	2.2	2.5	2.8	3.8	3.6	3.1	2.5	2.4	1.9	1.5	1.2	1.0	1.2
Maximum	23.6	23.2	25.2	27.2	29.6	29.4	34.1	37.1	38.8	38.1	39.2	38.5	37.9	36.0	34.0	34.2
Mean	7.3	6.6	7.4	8.4	9.1	9.1	11.8	13.5	14.1	13.2	13.0	12.5	11.6	11.0	10.2	10.2
Normalized range	3.0	3.3	3.2	3.0	3.0	2.9	2.6	2.5	2.5	2.7	2.8	2.9	3.1	3.2	3.2	3.2
Median	6.0	5.4	5.9	7.4	8.0	7.9	10.1	11.4	11.9	11.1	10.6	10.7	9.7	9.1	8.6	8.3
Median/ mean	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.8
75pc 5pc/ median	1.1	1.1	1.2	0.8	0.8	0.8	0.8	0.9	0.9	0.9	1.0	1.0	1.0	1.0	0.9	1.0
Kurtosis	-0.2	0.1	-0.3	0.3	0.3	0.1	-0.3	-0.6	-0.6	-0.4	-0.4	-0.5	-0.2	-0.1	0.3	0.1
Asymmetry	0.8	0.8	0.7	0.8	0.8	0.7	0.7	0.6	0.6	0.7	0.7	0.6	0.7	0.8	0.9	0.8
C.V.	57.4	57.9	55.9	45.7	45.1	45.2	44.0	44.3	45.1	46.4	48.6	50.4	52.9	53.9	52.4	51.9
N/S	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4
N-S	-6.9	-6.2	-6.9	-6.2	-6.6	-6.8	-8.8	-10.1	-10.8	-10.3	-10.6	-10.7	-10.3	-9.8	-8.5	-8.5

Assuming an asymmetric distribution of local unemployment rates over Italian districts throughout the time series, the coefficient of variation (CV) of that rate – a measure of the spatial dispersion evaluating both unemployment growth and decrease – was stably around 44%. CV values highlighted a reduced (geographical) variability during crisis, further increased during non-crisis times, when dynamic territories started to recovery, more or less rapidly, while pushing disadvantaged districts in a sort of downward economic spiral.

Therefore, considering the unemployment rate, while crisis led to a flattened and homogenized trend across the entire national territory, economic expansion led to relevant spatial inequalities. Lastly, Covid-19, a transitory shock in comparison to the great crisis (2007-2012), altered the unemployment rate in a lighter way. The negative effects observed in 2020, were overcame in 2021. Indeed, the established public subsidies to economic activities, even causing an additional debt exposure, preserved most of economic sectors, allowing the consolidation of higher employment rates in 2022 and 2023, as the preliminary estimations from Istat may delineate.

3.2. EXPLORING CHANGES IN THE DISTRIBUTION OF UNEMPLOYMENT RATES IN LOCAL LABOUR MARKETS

Figure 1 displays the results of a principal component analysis describing the latent relationships between the descriptive statistics of gross unemployment rates in the 610 Italian local labour market systems. The PCA biplot associated the descriptive statistics in Table 2 with each observation year between 2006 and 2021. Observation tears with similarities in descriptive statistics have been connected in the plot through a minimum spanning tree delineating the most representative development trajectory. PCA results identified two years of economic expansion, 2006 and 2007, and a break point in 2008-2009. Hence, the pre-crisis 2008 spatial path was different from the subsequent one (2009-2021). This spatial pattern has not changed in relation to Covid-19, since its contingent nature does not appear to have exerted any important (medium-term or long-term) effect on unemployment rates in Italy.
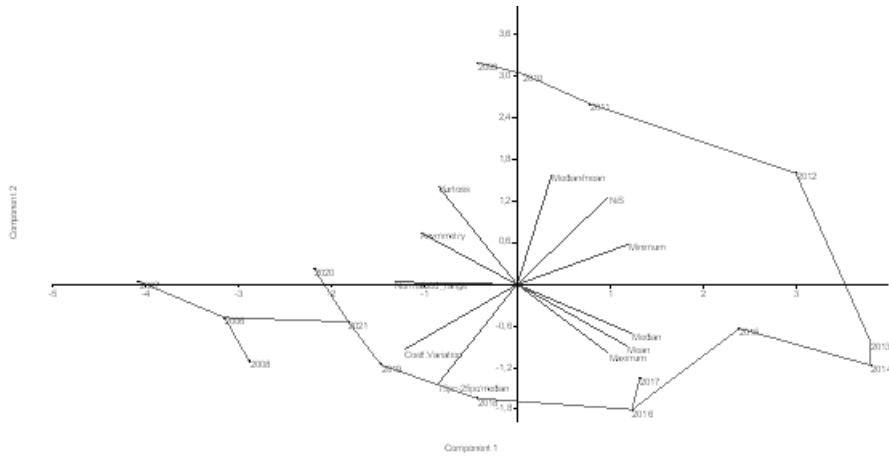
Figure 1: Biplot of a principal component analysis delineating the latent relationships between descriptive statistics of gross unemployment rates in local labour systems of Italy; results of a minimum spanning tree algorithm connect observation years and thus indicate the most representative development trajectory over time.

The latent relationship between descriptive statistics of gross unemployment rates in local labour systems of Italy, 2006-2021, were also reflected in the ordination plot illustrated in Figure 1, with explained variance 56.4% and 25.5% respectively extracted by Component 1 and 2. The minimum spanning tree path indicated the highest similarity among component scores, reflecting heterogeneity in unemployment distribution over economic districts of Italy. The observed symmetric distribution of the ratio between median and mean values, which is distinctive of 2010 and 2011, was also illustrated in the plot. Unemployment divides in Northern and Southern Italy reached the widest level during this time period. In recognition of the mechanism of economic convergence, persistent growth in northern regions and even stronger employment increases in southern regions have helped to reduce the north-south divide during economic expansion. Northern districts resisted to unemployment, while the disparities deepened, and southern areas started diverging even more throughout the crisis. The variability coefficient between more dynamic locations in the north and less dynamic areas in the south rose sharply and reached a peak in 2019. The biplot also showed how the ratio between the 75th and 25th percentiles and the median unemployment rate

approached the greatest values in 2018. Between 2015 and 2017, extreme values, especially the maximum unemployment rate in local districts, but also mean and median values, followed the same pattern. Due to the sluggish recovery, the normalized range, a measure of regional variability, reached its peak later on, in 2020–2021. The economic crisis brought on by the Covid-19 pandemics had exerted only a temporary impact on gross unemployment rates. However, the pandemic's effects were especially severe in some regions, possibly fuelling both asymmetry and kurtosis of unemployment rates. Particularly, Covid-19 had a significant influence on specific northern sectors (Bergamo and Brescia, in Lombardy, and, to some extent, Verona and Padua in Veneto). Other regions were affected significantly less from Covid-19, such as Liguria and Central Italy. From an economic perspective, southern regions have not been as significantly impacted. As a result, going beyond the north-south gradient, unemployment rates in places with high employment and a dynamic economy have been moderately altered. Within this context, subsidies failed to fully compensate for the jobs that were only partially subsidized.

3.3. JOB MARKET PERFORMANCES AND THE BACKGROUND LOCAL CONTEXT

A second PCA exercise was run with the aim at revealing the latent relationship between local job markets' performances and the related background context, extracting, on the first two axes, about the 50% of the total variability. Figure 2 shows the biplot of two principal components in the context of the 610 Italian local labour systems respectively in 2006 (a) and 2021 (b). Italian labour market systems are indicated with dots; Component 1 is associated with activity rate and unemployment rate; Component 2 is related to urban regions and population density of local systems. The two components explain respectively 36.1% and 13.2% of the total variance in the case of Figure 2(a), 37.3% and 13.8% in the case of Figure 2(b). In general, urban districts (URB) were associated with denser local areas but there is no clear path connecting urban regions and unemployment, since it also depends on the geographical location of each district. Component 2 (URB) had strong upward connections to urban regions and denser local systems. However, tourism-specialized systems were

ordered in opposition with urban system along Component 2. The activity rate and the unemployment rate were, on the contrary, associated with Component 1, although in the opposite direction. In particular, on the negative side of Component 1, unemployment rate (DIS) was associated with the dummy variable delineating southern districts. The unemployment rate increased in Southern Italy and decreased in Central and Northern Italy. Increases in activity rates corresponded to decreases in unemployment rates and vice-versa. In particular, when there are more clearly defined economic dynamics, there was an increase in labour market participation and a moderate decline of unemployment. This demonstrates the accuracy of statistics delineating the intrinsic functioning of regional economic systems. Industrial districts (DIT), as having high levels of specialization and business density, primarily found in Northern and Central Italy, performed higher rates of activity and employment. Similar to this path, manufacture (MAD) districts developed occasionally in Southern Italy, and more regularly in Central and Northern Italy. Regardless of the geographical gradient, unemployment rose in the South, following similar paths also in Northern and Central Italy as far as unspecialized districts (DES) are concerned, which are economic spaces dominated by basic services including constructions, public administration, wholesale, and retail trade. The number of municipalities (COM) in each local system and the share of agriculture (AGR) in total product seem to have no impact on these dynamics, when focusing on the dualism between wealthy and disadvantaged areas.

The PCA biplot also highlights the importance of areal size and geographical characterisation of employment and unemployment within the Italian context, with a clear connection with both the north-south gradient and the productive specialisation gradient. By the end of 2021, the economy was in a situation of moderate economic expansion, as shown in Figure 2(b). The variance extracted from the first two components increased slightly in respect with 2006. The geographical gradient was still significantly associated with Axis 1, illustrating the dichotomy between southern regions with lower employment rates and northern regions with a consistent participation in the labour market. The second axis showed a high loading for urban (and functionally mono-centric) areas. Nevertheless, this axis also depicted unspecialised systems. This context finally emphasized a high degree of spatial variability, the dualism between wealthy and disadvantaged areas, respectively with specialized and less

specialized activities, and the lack of a clear trend in employment and unemployment. Through the lens of unemployment dynamics, Italy's development reflected a complex path over time and, due to the short-term crisis of Covid-19, the dualism of participation and unemployment rates seems to persist as partly decoupled from economic specialization. In other words, dynamic and less dynamic areas do not follow exquisitely economic dynamics, while adapting to non-linear paths with a strong spatial heterogeneity and localism.
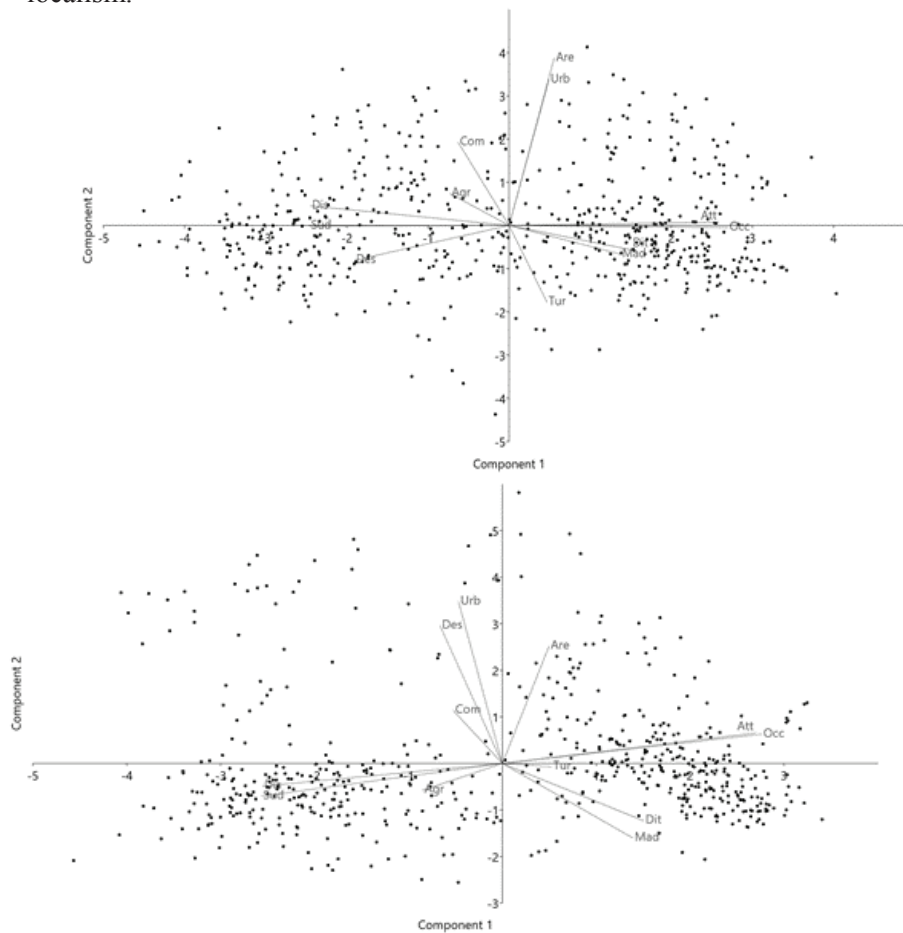

Figure 2. Principal Component Analysis of unemployment rates in local labour systems of Italy in (a) 2006 and (b) 2021.

4. DISCUSSION

In a pre-crisis stage, there were two 'Italies' running at different economic speed, as far as unemployment levels are concerned (Dunford, 2008). Dynamic territories coexisted with less dynamic ones, with higher unemployment rates (Dunford, 2002). The labour force was unequally distributed throughout the country following sharp urban-rural differentials, or industrial-service gaps against agricultural specialisation (Patacchini, 2008). The 2007 crisis triggered a sort of homogenization between dynamic and less dynamic territories, possibly narrowing urban-rural differentials (Mauro, 2004). Within this context, the most dynamic areas have experienced a higher burden rather than the remaining districts in the country (Salvati et al., 2017). After the crisis, namely between 2015 and 2019, the economic system was unable to recovery at the pre-crisis level. In the last decade, the market share of the industrial sector, and especially the 'Made in Italy' businesses, experienced important losses compared with the past (Urso et al., 2019). Conversely, the potential of tertiary sectors, as tourism and related sectors, increased (Cainelli and Iacobucci, 2012). The present work provides an original view to interpret territorial inequalities in the Italian job market and, more in general, in other European countries where territorial disparities in employment and unemployment strongly affect economic dynamics, as in Spain and England (Gonzales, 2011). In these economies, social and economic factors sharpening territorial differences over time are recognized to be of particular relevance when designing policies for their containment (Salvati et al., 2018; Masini et al., 2019; Zambon et al., 2019). These measures should, in turn, warrant more efficiency in the dynamics of regional and local economic systems (e.g. Chelleri et al., 2015). Territorial disparities have been based on the efficiency of labour markets, according to indicators of participation, employment, and unemployment (Salvati et al., 2017). These measures are easily retrieved by official statistics, by means of internationally standardized methodologies, and are available to sectoral experts and political stakeholders (e.g. Carlucci et al., 2018). The adoption of labour systems as a spatial analysis' unit is not new (Chieppa and Panizon, 2001). Nevertheless, recent Istat data releases offered a comprehensive overview of the employment/unemployment scenarios in Italy (Franconi et al., 2017). The investigated time window allows a comparative analysis of economic growth, culminated in the 2008 crisis, and the effects of the great crisis on the labour

market regulated by two reforms, namely 'Pacchetto Treu' and 'Legge Biagi', examining as well the recent crisis brought by Covid-19 (Cracolici et al., 2007). In general, the observation time adopted in our study reflects the impact of multiple economic downturns (Frenken et al., 2007). Such impacts have been evaluated not only on the level of unemployment but also on the intensity of territorial disparities (Glaeser et al., 2014). Our analysis discriminated 'leading' regions, i.e. those who improved their development path, from the 'laggers', i.e. regions with poor market performances and recognized to be more sensitive to short-term shocks (Martin and Sunley, 2015). The novelty of this work lies in the identification of the effects of short- and medium-term shocks (Boeri and Jimeno, 2016), highlighting in turn the importance of carrying on the continuous production and release of historical series of labour market indicators with a strong spatial detail (Patacchini, 2008). The empirical results of this study also remark the significance of a comparative and contextual analysis of multiple indicators, such as participation, unemployment, and employment rates jointly, to delineate the functioning of local labour markets (Veneri, 2010). An accurate collection of data from official statistics under a geo-economic perspective facilitates the design of a set of contextual variables (Bande and Karanassou, 2013), further integrated with newly available indicators retrieved from different administrative (economic/demographic) archives (Salvati, 2016). The elaboration of new indicators to implement comparative analysis should be advisable at the European level (Ciommi et al., 2019). Unfortunately, the geography of labour systems is codified in a very partial and fragmented way in Europe, and it is explicitly adopted only in some national statistical systems (Chieppa and Panizon, 2001). The English system widely benefited from the geography of local labour systems (Cainelli and Iacobucci, 2012). In this system, indeed, travel to work areas represented, for several years, an accurate analysis' unit (Battaglia and Iraldo, 2011). Research trials have also been performed in Spain and France, among others (Franconi et al., 2017). The relevance to have some more detailed spatial units for statistical reporting than provinces/prefectures (NUTS-3 level), being in turn less detailed than municipalities (NUTS-5 level), is a relevant challenge in official statistics (Ciccone, 2002). This is because, if on the one side there is an increasing demand for official statistics, on the other side the demand of municipal-scale indicators cannot be satisfied in the case of sampling surveys (Cracolici et al.,

2007), where the sample size is not enough to disaggregate the most relevant variables to geographically detailed reporting scales.

5. CONCLUSIONS

Local labour systems represent a valid compromise between different disaggregation levels, since they provide an enough articulated geographical picture of territorial disparities at an appropriate level of spatial disaggregation. The adoption of local labour systems represents a basic step for future developments of homogeneous official statistics in Europe. At a country level, more efforts should be placed in the elaboration of geo-referenced statistics to reach and cover wider administrative domains. Scholars, practitioners and policymakers would benefit from this implementation program, since they need continuous information for socioeconomic policies responding (and possibly adapting) to the heterogeneous characteristics of each target area.

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