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D7.1 Assessing the determinants of labour market inclusion for vulnerable European citizens: an eco-systemic and multi-level approach

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**European Labour Markets Under Pressure –
New knowledge on pathways to include persons
in vulnerable situations**

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Introduction

Employment and related phenomena (such as short- and long-term unemployment, activation and participation in the job market, underemployment etc.) are on the top of the agenda of European policy makers at least since the end of WWII. Over the decades, coherently with evolving social and economic circumstances, different approaches and policies have been put in place to find an answer to a fundamental question: "How do we get more people to work?".

From the 50s to the 70s, the bulk of efforts to answer the above-mentioned question was focused on the supply side: the number of employed was mainly limited by the availability of jobs (Eichengreen, 1996). Coherently with the Keynesian approach prevailing at the time, public institutions either through public investments or through measures to favour private investments played a pivotal role (Glyin, 1995). Many countries set up agencies to foster the creation of employment opportunities in disadvantaged areas and endowed them with relevant financial means. Among the main examples, the Cassa del Mezzogiorno in Italy, the Délégation à l'Aménagement du Territoire et à l'Action Régionale in France and the Inistituto Nacional de Industria in Spain.

The 60s and 70s were also decades characterised by a growing ability of workers to put in place forms of collective action advocating for more rights and challenging current power structures (Wright, 2002). This wave of activism and participation favoured the emersion of the specific claims of often marginalised groups such as women, persons with disabilities etc. (Boris and Orleck 2011; Kaplan 2012). This contributed to clarify that specific groups of the population were (are) prevented from a full and effective capability to participate to the labour market, i.e. the participation to the job market (i.e. prevented from fully enjoying their rights as workers) as they used to experience specific barriers notwithstanding the actual availability of job opportunities (Pfau-Effinger 2017, Goldin 2014). In other words, the fact that a woman (or person living with a disability, a person living with chronic health problems etc.) is less likely to work, if working less likely to be well paid, if retired more likely to receive a below average pension etc. is not just linked to the number and variety of job opportunities but also to a structural, systematic and multi-layered discrimination (Sainsbury 2018; Hurley et al., 2021).

The 80s and the 90s saw a progressive paradigm shift. The neo-liberal counter revolution (Duménil and Lévy, 2005) is a somewhat general label under which we include a heterogeneous set of changes in policies regime mainly based on a stronger emphasis on market-led processes, the push for a weaker role of the state, a general claim to have weaker constraints to the action of market actors and forces etc. This change had considerable consequences in terms of approaches to employment policies: all in all, we observed a shift focus from the creation of employment opportunities to the improvement of individual employability. Coherently with this vision, the objective of employment policies should be "to equip" individuals so that they increase their ability to participate to the job market: this entails strong investments in education, training on soft and hard skills, re-tooling as well as on related domains such as ECEC services. According to a somewhat mitigated version of a purely neo-liberal vision, the range of action of public institution is extended to fostering the coexistence of high level of labour market flexibility with a fair security standard (Muffels and Wilthagen, 2013): it is the so-called flexicurity approach that gained a growing space in European narratives and policy initiatives

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including the Lisbon Treaty (European Commission 2012; Bekker et al. 2008). The goal is GDP growth, and the labour force is the mean rather than the final objective in terms of multidimensional wellbeing.

A trend that has progressively gained prominence since the 1980s is the awareness about the centrality of local contexts in development processes, and therefore also in determining people's employment trajectories. From the perspective of the theoretical debate on development, heterodox theories developed from Hirschmann's (1958) work have constituted a 'third way', both in contrast to a rigidly dirigiste and Keynesian vision (focused on the role of the state as an investor, if not directly as an entrepreneur) and to neoliberal approaches, which see the free functioning of market forces as the primary driver of development and the creation of job opportunities. As Hirschmann (1958, p. 5) effectively stated, "development depends not so much on finding optimal combinations for given resources and factors of production as on calling forth and enlisting for development purposes resources and abilities that are hidden, scattered, or badly utilized." Hirschmann also focused on the concept of Social-overhead capital to emphasise the role of human capital, and in particular the pivotal role of basic social services and institutional support that are at the core of the development process and that are different in different contexts. Essentially, this refers to a resource mobilization process that cannot be separated from the context in which it occurs or is intended to occur. This type of approach has subsequently developed in various ways (see also section 2.2), leading, at the level of European institutions, to an increasing interest in so-called place-based policies (Barca, 2009).

The progressive Europeanization of cohesion policies (with related implications in terms of employment policies) has been a further driver leading to a more relevant role of the local level. Although it is possible to identify early signs of European cohesion policies in the 1957 Treaty of Rome, a decisive acceleration in this regard occurred with the creation of the European Development Fund in 1973. With the Single European Act of 1986, economic and social cohesion were officially recognized as accompanying policies "in order to promote harmonious development throughout the Community". The Structural Funds and the European Investment Bank were identified as the principal instruments for this purpose. This process continued with the 1992 Treaty on the European Union, which established the Cohesion Fund and reinforced the role of the Structural Funds. An interesting aspect of this process is that Europeanization can be interpreted on at least two levels. The first, more intuitively, concerns the increasingly significant and structured role of European institutions in this field. The second, more complex, pertains to the emergence of multilevel governance mechanisms that have become necessary to facilitate dialogue between European institutions, member states, and local authorities, which are, in most cases, responsible for the implementation of projects. This process implied both "the reorientation or reshaping of politics (and governance) in the domestic arena in ways that reflect policies, practices, or preferences advanced through the EU system of governance" (Bache and Jordan 2006: 30), as well as the emergence of local authorities as key actors in employment policies. The resulting framework is therefore far more complex when compared to the Keynesian state model that characterized the 1950s and 1960s, where the central state's role was decidedly more prominent.

The overall trajectory of the EU after the Great Recession of 2008 has shown that convergence in terms of growth, of employment and of enjoyment of social rights (the so-called social upward convergence) is still far from being achieved (Boeri and Jimeno, 2016). As an example, Biggeri et al. (2022), by analysing the Social Scoreboard indicators identified a social divergence on multiple levels. On the one hand, we have Southern Europe performing substantially worse than the rest of the continent. On the other hand, at the subnational level, we see internal divergence within many member states. Other authors have gone further, investigating the political implications of this divergence (Rodriguez-Pose 2018; Rebechi and Rodhe 2022; Dijkstra et al.2020).

Starting from 2020, the pandemic crisis with its consequences, rising geopolitical instability, and the structural challenges linked to the triple transition (digital, green, social) have further increased the complexity of the scenario, as each of these phenomena has consequences for access to employment and the barriers that may prevent EU citizens from fully and effectively participating in the labour market (OECD 2023; JRC 2021). Finally, the aging population and the resulting pressure on social protection systems have pushed more and more countries to consider the increase in labour market participation as a priority, either through extending working life or through higher participation rates of population groups at greater risk of marginalization (elder workers, women, youth, persons with disabilities etc.) (European Commission, 2021).

Building on these notions, this paper aims to contribute to the debate concerning which factors influence both labour market participation and the employment status of citizens in the 27 EU member states plus Norway through a regional perspective. Research questions this paper tries to address regard the role played by individual and contextual characteristics on labour market participation and employment, and how these two levels interact with each other. As per the conceptual framework, we rely on the Capability Approach by Sen (1999), according to which, the capability of having a decent work depends on individual conversion factors as well as societal and environmental conversion factors.

The dual focus on labour market participation and employment serves two purposes: first, it helps to mitigate issues of self-selection bias that are common in this type of analysis; second, it highlights how various individual and contextual characteristics can have divergent effects on these two dimensions, with significant implications for territorial cohesion and social inclusion policies. Moreover, particular attention will be devoted to labour market trajectories of vulnerable groups. Methodologically, the paper is based on a three-level multilevel analysis using 2010-2022 EU-SILC data and a dataset that provides disaggregated contextual information at NUTS2 and/or NUTS1.

The work is structured as follows: the Background and Conceptual Framework section summarizes previous studies relevant to the research topics and introduces the theoretical basis of the study. The Methodology and Data section presents the research design, the data and the analytical specifications adopted. The Results section presents the main findings, starting with descriptive statistics, followed by an analysis of individual and contextual determinants, and concluding with a comparison of these determinants' effect across rich and poor regions. Conclusions follow.

Background and conceptual framework

Our paper benefits of (and will hopefully contribute to) two strands of literature: the first, primarily situated within the labour economics discipline, examines the traditional individual and contextual determinants of labour market participation and employment; the second aligns instead closer with the local development approach and regional economic studies.

According to the first strand, the individual determinants of labour market participation and employment most often reported as significant in the empirical literature are the following: age, gender, education, disability conditions, migration background, employment history, household's economic situation and caring responsibilities (Dvouletý et al., 2019, Kelly et al. 2014, Lundin and Hemmingsson 2013, Marelli, 2013). Generally, these studies found that younger adults, females, and youth with disabilities face higher odds of unemployment and exclusion from the labour market. Lower levels of education and caring responsibilities also reduce the likelihood of employment, while previous work experience increase it (Jaumotte,

2003; Vlasblom and Schippers, 2004; Gabriele et al., 2011; Cipollone et al., 2014; Mussida and Patimo, 2023).

Contextual factors, such as the stock of human capital, transport infrastructure, and the industrial structure of the economy, significantly shape labour market participation and employment (Jiwattanakulpaisarn et al., 2010; Tomić, 2018). Additionally, labour market policies and institutions play a crucial role: social protection policies such as unemployment benefits and employment protection legislation are designed to reduce vulnerabilities and provide safety nets. Market-oriented policies, including active labour market policies (ALMP), emphasize improving individual employability through skills training, re-skilling, and labour market reintegration (Dvouletý et al., 2019; Grigoli et al., 2018).

To classify employment status determinants into the above-mentioned categories (context and individual) expose to the risk of neglecting a basic fact: concrete individuals (i.e. heterogeneous individuals with specific characteristics) live in specific places and in a specific time. What we observe in terms of employment related outcomes (and not only) is the result of this interaction. As a consequence, a second strand of literature, to which our work speaks as well, draws on studies of local development and regional economics and looks instead at the interaction between individuals' and places' characteristics. This literature, pioneered by Hirschmann (1958) and then by the Barca's report (2009), the 2009 "How Regions Grow" OECD report and by the paper by McCann and Rodriguez-Pose (2011), points to the necessity to move beyond the "one-size-fits-all", space-neutral development approaches typical of those traditionally offered in the past, and to the recognition that different territories often face specific challenges that require tailored solutions.

As per labour market issues, this strand recognizes how regional structural economic factors might impact regional labour market outcomes. Di Cataldo and Rodriguez-Pose (2017) find that infrastructure, human capital, innovation and quality of government impact employment generation, but this impact depends on regions' conditions: for instance, authors found that while in the better-off EU regions innovation capacity contributes to employment growth, the presence of a highly educated population increases employment in regions characterized by lower economic development. Local human capital level has been confirmed also by Winters (2013) to produce positive externalities on the probability of LFP and employment for both US women and men. The regional impact of high-level human capital has been analysed also in the urban development literature stream, in particular starting with Florida's "The rise of creative class" (2002). Florida's initial ideas emphasized reimagining cities with a focus on the so-called "creative jobs", such as artists, scientists, engineers, and educators. However, over time, this approach raised a lot of criticism and led to unintended consequences, displacing long-time working-class residents due to gentrification and increasing living costs in these areas.

Interregional inequalities have become that evident and prominent in the policy debate, that Iammarino et al. (2017) proposed a classification of European regions into four economic clubs, highlighting the essential need to move beyond the national level and capture the various regional heterogeneities. According to the authors, interregional disparities emerge as a result of two main forces: the first one, for which, since the big wave of technological innovation in the 1970s, high-tech and knowledge-intensive sectors have concentrated in large metropolitan areas, while increased automation has reduced trade costs and replaced routine, low-skilled jobs, and manufacturing has become more geographically dispersed and outsourced. The second one is connected with place-specific factors, such as human capital, industries, institutions, innovation capacity, and adaptability to change.

In this framework, our paper makes two distinct contributions. First, within the labour economics literature, we aim to provide new empirical evidence by utilizing a notably large, updated, and highly detailed dataset, covering 27 EU countries and Norway over 13 years,

disaggregated at the NUTS1 or NUTS2 level. This enables us to offer robust and updated findings that contribute to the ongoing debate on the determinants of labour market participation and employment across Europe. Second, regarding the local development and regional studies literature, our contribution lies in demonstrating that not only individual and spatial characteristics do influence labour market outcomes, but also that specific individual characteristics may have varying effects depending on the geographical and economic context. This highlights the critical need to conduct subnational research and consider the interplay of individual and regional factors when analysing labour market dynamics, with important implications for policy.

The ability to participate in the labour market with access to decent work within one's community is one of the most critical among the capability dimensions given its direct linkage with human well-being and social inclusion (ILO, 2006). Nussbaum (2011) identifies it as a basic human need. The ability to engage in the labour market with decent jobs holds substantial instrumental value for individual well-being and societal inclusion. Having access to decent work, characterized by fair employment conditions and adequate income, enables a range of other capabilities, such as maintaining good health, developing meaningful social relationships, avoiding exploitation, gaining respect from family and peers, participating in decision-making, fostering self-esteem and agency, and enjoying adequate leisure time. This entails a strong focus on the intrinsic and extrinsic value of work (Soffia 2023). Consequently, the absence of opportunities to participate in the labour market in decent work (Abbot et al., 2016) can result in significant discrimination for certain groups. Gaps in employment participation, such as those based on gender or disability, extend beyond direct economic losses, profoundly impacting individual quality of life and creating broader social repercussions through the restrictions placed on individual opportunities and capabilities.

Framing labour market participation and employment issues through the Capability Approach constitutes a promising starting point given the previously described research question. More precisely, the capability approach allows us to conceive the individual employment status (employed vs unemployed, active vs non active) not as mere label but as the result of number of interacting social, cultural and economic processes.

Neo-liberal approaches tend to over-emphasize the role of individuals and of individual-level policies in influencing the employment status: in a way, if the market is by definition right, what is left is to act on individual actors by empowering/training/motivating/enabling them if not by blaming their "dysfunctional" behaviors such as being too choosy, too lazy, too attached to the place they are living in and thus not open to move etc. (Monti, 2010). On the contrary, perspectives solely based on protection tend to neglect the role of agency defined as the individual commitment to shape their lives and influence the context (Nebel et al. 2018). The CA approach allows us to overcome the alleged dichotomy between activation and protection to focus on the interaction between person and the context. This is relevant both in terms of analysis and of policies: a capability-based analysis is expected to shade light on those mechanisms while policies are expected to act on the aspects that for a given person in given place (and time) prevent from fully enjoying opportunities and freedoms, including job-related ones.

This entails the role of conversion factors acting on different levels: at the individual (e.g., metabolism, physical condition, gender, education, age, previous experiences), environmental (e.g., geographic location, physical characteristics of the area), and societal (e.g., public policies, social norms, institutions, discriminatory practices, gender roles). Moreover, the coherence between individual expectations and the opportunities provided by the context is a key factor as well. All in all, people present different labour-related outcomes because of factors acting at the individual, household, local, national, global level as well as by their interplay.

Moreover, the CA helps to unpack labour-related deprivation. Persons who are economically inactive could be outside from the labour force for different reasons:

- inability to work: given the current level of technology and bio-medical knowledge, someone may be unable to do any substantial work because of certain illnesses, injuries, or conditions

- formal rules: people could be kept outside from the labour market by specific legal provisions

- involvement in other activities: students or persons who have care duties could simply not have enough time (particularly in absence of support services) to work

- informal rules: social values and norms may be a strong although informal disincentive to participate to the labour market.

- discouraged worker-effect: people may realise that, given the opportunities plausibly available to him/her, the probability to find a job that one can and may want to accept is de facto extremely low. This may result in a permanent or at least long-term departure from the condition of being economically active (Ozerkek, 2013).

- preference: some people may simply be not interested to work. As such, particularly considering what may happen in middle-term life trajectories, some individuals may find themselves outside from the labour force because of a deliberate, aware and legitimate choice.

Note that the difference between being discouraged (and thus inactive) and being not willing to work incoherence with one's preferences is somewhat fuzzy: individual preferences may at least partially adapt to what is actually achievable (Teschi and Comim, 2005).

In other words, a relevant part of those who are inactive are deprived in terms of opportunities as "having/finding a job" is something outside from what is actually achievable. On the other side, being unemployed is a different form of deprivation: an unemployed person perceive himself/herself as a worker who is not currently working as he/she is not in the condition of finding a job or at least not a job that is coherent with his/her needs, expectations, skills etc. This difference suggests that activation and employment should be investigated as separated although deeply interlinked phenomena who are likely to be influenced by different factors or by similar factors but in a different way.

The CA thus accommodates a multilevel perspective, from the macro-level influences of national policies on education, training, and active employment policies, to subnational institutions and local grassroots organizations, bridging national goals with regional and local realities.

This means that social and environmental conversion factors of different regions and countries are going to shape the level of participation according to the individual characteristics of the persons. The same person in different places may have access to a narrower or wider set of opportunities and then to present different levels of achievements in terms of labour-related functionings (Biggeri and Ferrannini, 2014). Interestingly individuals should not be conceived as the mere target of these multilevel processes. On the contrary, their agency has a transformative potential through feedback loops that may contribute to change the setting. As an example, individuals can choose, if the option is viable, to be enrolled in training activities so modifying their individual conversion factors (via increased education and skills), can be engaged in collective action (e.g. through trade unions) so influencing policies and rule. They can even decide to migrate so completely changing in the territorial conversion factors they have to deal with.

Methodology and data

Data

The main data used for our analysis have been extracted from the European Union – Statistics on Income and Living Conditions (EU-SILC). EU-SILC is a cross-sectional and longitudinal sample survey, coordinated by Eurostat, based on data from the European Union member states. EU-SILC provides data on income, poverty, social exclusion and living conditions in the European Union, as well as detailed information about respondents' participation in the labour market. The EU-SILC reference population includes all private households and their current members who are residing in the territory of the countries at the time of the data collection. All household members are surveyed, but only those aged 16 or older are interviewed. Different types of sampling have been used depending on the country: the most used sampling design is stratified multistage sampling. Depending on the country, it is possible to retrieve the geographical location of the respondent disaggregated at the NUTS0, NUTS1 or NUTS2 level (in Table A 1 in the Appendix we provide the number of observations by country and NUTS level).

We restrict our working sample along several dimensions: as the longitudinal component of EU-SILC is far more limited in sample size compared to cross-sectional component, for our analysis we use the latter and treat the sample as a pooled cross section. We also restrict the sample considering only respondents falling into the EUROSTAT working age group (i.e., individuals between 15 and 64 years of age) and we exclude from the sample full-time students, as their performance is not of interest for our study. Therefore, our final working sample from EU-SILC is composed of 28 (27 EU countries + Norway) and 117 different NUTS regions for the 2010-2022 period, for a total of 3,845,746 observations.

As we are interested in understanding labour market conditions of vulnerable groups, the at-risk groups we have been able to identify through information provided in the EU-SILC are the following, although with some caveats:

- Females: unfortunately, EU-SILC provides information only about the biological sex of respondents. It does not provide information about their gender nor their sexual orientation, which in some cases can be a source of discrimination or vulnerability in the labour market (Q. n. PB150).

- Person with long-lasting illness: our primary objective was to investigate the situations of people with disabilities. Unfortunately, in EU-SILC there are no specific questions on disability, but there is a question that asks respondent if they have any longstanding illness or health problem, and we use that question as proxy for disability (Q.n. PH020).

- Households with limited wealth: we use information provided on the tenure status of respondents (whether the respondent is an owner or whether must pay a rent), which we use as a proxy of respondent's wealth. We acknowledge that this variable is an imperfect proxy for wealth, but there is evidence that homeownership is positively and significantly associated with wealth accumulation over time (Di et al., 2007). We also argue that using income information instead might suffer from not negligible reverse causality (Q.n. HH021).

- Low educational level: we use information on the highest ISCED (International Standard Classification of Education 2011) level successfully completed by the respondent (Q.n. PE041).

- Carers: the EU-SILC contains a question about the number of months spent on domestic tasks and care responsibilities. We consider a carer a respondent that has spent at least 1 month in these activities in the year of the survey (Q.n. PL089).

- Parents and lone parents: through information on the type of household, we look to the effect of being a lone parent or a couple with children against being single or a couple without children (Q.n. PB190 and PB200).
- Living in remote areas: EU-SILC provides information on whether the respondent lives in cities, or in town and suburbs or in rural areas (Q. n. DB100).

To note that we have not been able to include the migrant status among the predictors of vulnerability as the question about the country of origin has been included in the EU-SILC only since the 2021 wave.

Regional database

For information at the regional level, we construct an auxiliary dataset with data from Eurostat's Regional Database and OECD database, that we merged with the EU-SILC. Specifically, we extracted information on the following dimensions:

- Regional Gross Domestic Product (PPS per Inhabitant): A measure of the economic output of a region, adjusted for purchasing power standards (PPS) to account for cost-of-living differences, expressed per inhabitant. We introduce it in the analysis of as a proxy of the economic development of the regions.

- Unemployment Rate: The percentage of the labour force in a region that is unemployed and actively seeking work.

- Activity Rate: The proportion of the working-age population in a region that is either employed or unemployed but actively seeking employment.

- Motorways Network: The total length of motorways within a region, serving as an indicator of physical infrastructure and accessibility of the regional labour markets.

- Herfindahl–Hirschman Index (HHI): A measure of economic diversification within a region, calculated based on the concentration of economic activity across sectors. Higher values indicate lower diversification and dominance by fewer sectors.

- Tertiary Education Attainment: The percentage of the regional population aged 25–64 that has completed tertiary education, reflecting the region's level of human capital.

- Expenditure on ALMP (as % of GDP): The share of a country's GDP allocated to Active Labour Market Policies (ALMP), which include initiatives such as job training, employment subsidies, and public employment services.

To address missing data, a two-step procedure was used. First, a linear interpolation was made for variables with missing data for which we had information on the previous and following years. Following this, values from the NUTS2 level were aggregated to NUTS1 level, based on region's population or GDP per capita, depending on the nature of the imputed variable.

A table with all summary statistics of the variables used in our study is available in Table A2 in the Appendix.

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Methods

Our methodology relies on multilevel modelling of respondents' labour market participation and employment status. Multilevel modelling is particularly appropriate to study nested data designs, where respondents are organized within more than one level, and in our case individuals (i) are nested within European regions (j), NUTS2 or NUTS1 according to data availability. As mentioned above, labour market participation and employment status are often influenced by individual-level factors (e.g., age, education, gender) and contextual factors at a higher level (e.g., regional or country-specific economic conditions, policies), and a multilevel specification explicitly accounts for this structure, by modelling both individual and contextual influences taking into account the nested structure of the data. Therefore, we adopt a three-level multilevel modelling with random intercepts, where the three levels are respectively: the respondent level i, the region-year jt level and the region j level. With this specification, we are able to capture variation between different regional-year units (i.e., how conditions in a specific region in a specific year influence the outcome) and variation across regions that are stable over time, as proposed by Schmidt-Catran and Fairbrother (2016) and as in Fairbrother (2013).

As we are interested in exploring determinants of both labour market participation and employment, we run parallel analysis on these two different outcome variables. We do this in a sort of hurdle model, constructing our two outcome variables as follows:

Active: Our first dichotomous outcome variable concerns labour market participation and takes the value of 1 in all cases except for respondents that define themselves as inactive, unable to work or retired; for these respondents the variable is 0.

Employed: Our second dichotomous outcome variable is called employed and is defined only for those who are active in the labour market, excluding the inactive from the definition. This second variable takes value 1 when the respondent worked both full-time or part-time at least 6 months during last year, while it takes the value 0 when the respondent is active in the labour market but unemployed (i.e., unemployed at least 1 month during last year, but also less than 6 months spent in employment even if the other months are not in unemployment) .

Since we consider separately determinants of labour market participation and employment, this allows us to avoid potential self-selection bias issues. This is because individuals who are active in the labour market represent a specific subset of the population, and their characteristics may differ systematically from those who are inactive. For example, people with higher skills, stronger work experience, or fewer caregiving responsibilities are more likely to participate in the labour market, which can skew analyses of employment determinants if these pre-selection factors are not accounted for. By addressing these processes separately, we ensure that our analysis accurately captures the unique drivers of both labour market activation and employment outcomes, leading to more reliable findings.

We add explanatory variables at the individual level coherently with the literature and the CA, and within the limits of the information available from EU-SILC, namely: age categories (15-24, 25-54, 55-64, following the EUROSTAT classification of working age population), sex, household type, long-lasting illness, the tenure status, care responsibilities and domestic tasks, whether a person lives in a urban, peri-urban or rural area and the level of education.

We also add explanatory variables at the regional level, to control for the CA's societal and environmental conversion factors, namely: the region's GDP per capita, the activity/unemployment rate, the motorway network as a proxy for region's physical infrastructures, the Herfindahl–Hirschman index as a proxy for regional economy's diversification, the s80/s20 ratio as a proxy for the inequality level in the region, the national expenditure on ALPM as % of national GDP and the tertiary education attainment rate, as a proxy regions' human capital. We introduce regional variables following Fairbrother (2014),

allowing for the simultaneous but separate analysis of cross-sectional and longitudinal relationships. We do this by inserting a variable's temporal mean and subtracting that mean from the time-varying variable of interest. In this way, we are able to capture two distinct effects: the cross regional differences and the temporal deviation. For the former, the intertemporal mean allows us to examine how long-term, region-specific characteristics of the contextual variables influence the outcome variable y. For the latter, the deviation from the intertemporal mean isolates the impact of short-term fluctuations within a region over time.

Lastly, we also add year dummies to control for unobserved changes that are common across all observations for a given year.

Therefore, the resulting logit model is:

$$logit\,(P_{ijt}) = \beta_0 + \sum_{m=1}^{n} \beta_m X_{mijt} + \sum_{p=1}^{n} \gamma_p Z_{ptjM} + \sum_{q=1}^{n} \lambda_q \bar{Z}_{qj} + \rho_4 T_t + u_j + v_{jt}$$

Where:

P_ijt are the two outcome variables' probabilities

X_mijt are M individual level variables

Z̄_qj are regional means for contextual variables

Z_ptjM are the deviations from the mean

T_t are year dummies

u_j is the random intercept for the regional level j

v_jt is the random intercept for the regional-year level

Random effects are independent, normally distributed with mean 0 and variance σ_v^2 and σ_u^2.

Additionally, as one of our aims is to detect whether there are differences in the effect of the individual-level Xs between poor and rich regions, we create a dummy for the identification of rich against poor region (HighGDPpc), adopting a definition following Iammarino et al. (2017). Simplifying their classification, we define rich regions as the ones that have a GDP per capita above 120% of EU average, and poor regions as the ones that have a GDP per capita below the 120% of EU average of the same year .

Therefore, the second model we estimate takes the following form:

$$logit\,(P_{ijt}) = \beta_0 + \sum_{i=1}^{n} \beta_i X_{ijt} * HighGDPpc_{jt} + \sum_{j=1}^{n} \gamma_j Z_{jt} + \rho_3 T_t + u_j + v_{jt}$$

In all specifications we allow the covariance matrix to be unstructured, as it is the most flexible given that it does not impose any constraints on the correlations between random effects at different levels of the model.

Results

Descriptives

Descriptive statistics reveal a high variation in terms of activity rate and employment across NUTS2 regions.

Figure 1 presents a definitely varied situation: at the country level, we can note how Scandinavian and Baltic countries show the highest levels of activity rates, while especially Southern countries suffer a lower participation rate in the labour market. If, however we go to the subnational level, a relevant heterogeneity emerges: France for example displays lower activity rates in central and some southern regions, and the same is true for Italy, while Spain shows higher activity rates in central and eastern regions compared to northern and southern ones.

Figure 1: Activity rate (15-64 y.o.) by NUTS2 region in 2022
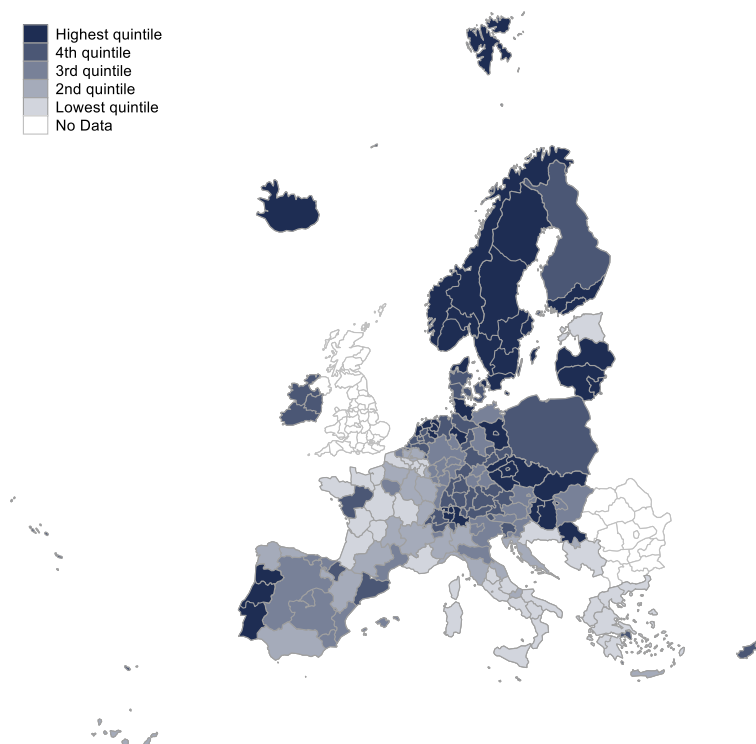
Source: Authors' elaboration on EUROSTAT data

Employment rates (Figure 2) present a high degree of heterogeneity as well. Again, most of the regions of the Scandinavian countries belong to the highest quintiles of distribution. Eastern and Baltic regions perform relatively well, but slightly worse compared to their performance in activity rate. German regions instead show a better performance in employment, while many Portuguese, Spanish and Italian regions (and the whole Greece) display a substantially worse performance, as they belong to the lowest quintile of the distribution. In addition to the significant heterogeneity observable at the subnational level, the comparison between the two maps reveals that the two phenomena under consideration do not completely overlap. On the one hand, there are indeed regions, mainly in the Scandinavian area, that excel in both

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dimensions, showing higher-than-average performances both in terms activity and employment rates, as well as other regions characterised by poor performances in both areas. Nonetheless, what stands out is the existence of regions where a relatively high activation rate does not necessarily translate into corresponding employment gains; this happens in many Baltic and Eastern Europe regions, as well as for instance in many Portuguese and Spanish regions. This divergence highlights the complexity of labour market dynamics, emphasizing that high activation efforts alone are not sufficient for fostering employment growth, and that regional context plays a critical role for the success of these policies.

Figure 2: Employment rate (15-64 y.o.) by NUTS2 region in 2022
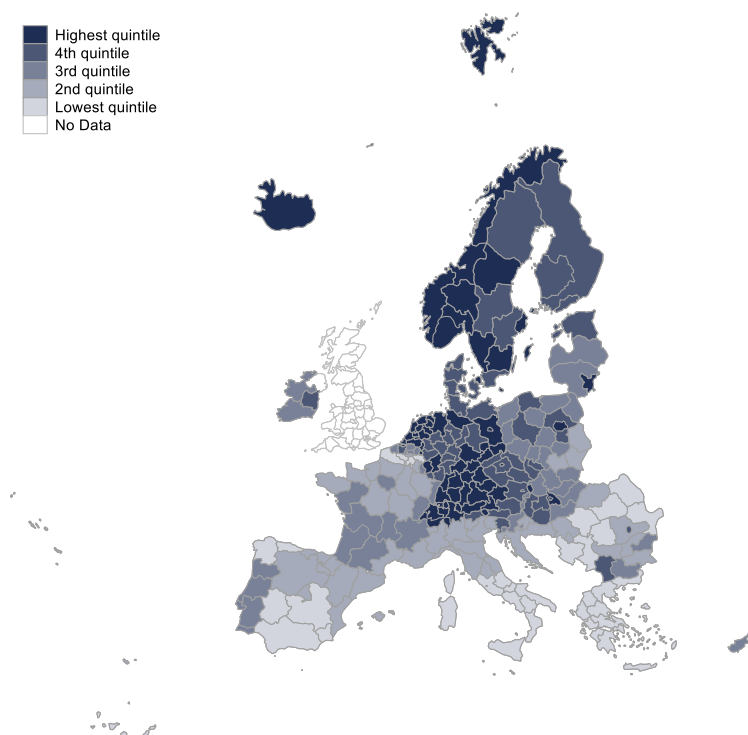
Source: Authors' elaboration on EUROSTAT data

Differences in our outcome variables emerge also if we look at their temporal trends across the four regional economic clubs (Figure 3 and Figure 4) Regions with a very high GDP per capita display both trends as more stable, with smaller improvements over time, reflecting well-established labour markets; regions with high GDP per capita display the highest activity and employment rates among the four groups, medium GDP per capita regions show a lower but increasing trend in both dimensions and low GDP per capita regions show the lowest levels of both dimensions throughout the period of our study, but still with positive tendencies. Besides the individual trends, if we look at the aggregate, we can note two other aspects: first of all, activity rates display a lower variability than employment. Indeed, activity rates range from 76.7% and 89.7%, while employment rates range from 60.1% and 80.3%. This indicates that barriers to access effective employment vary substantially across economic regions. Second, on average, both trends show positive movements throughout the period, with some decreases after the financial crises and the Covid-19 pandemic, but in general we can say that the various European regions are improving their labour market structures.

Figure 3: Activity rate and GDPpc at the regional level
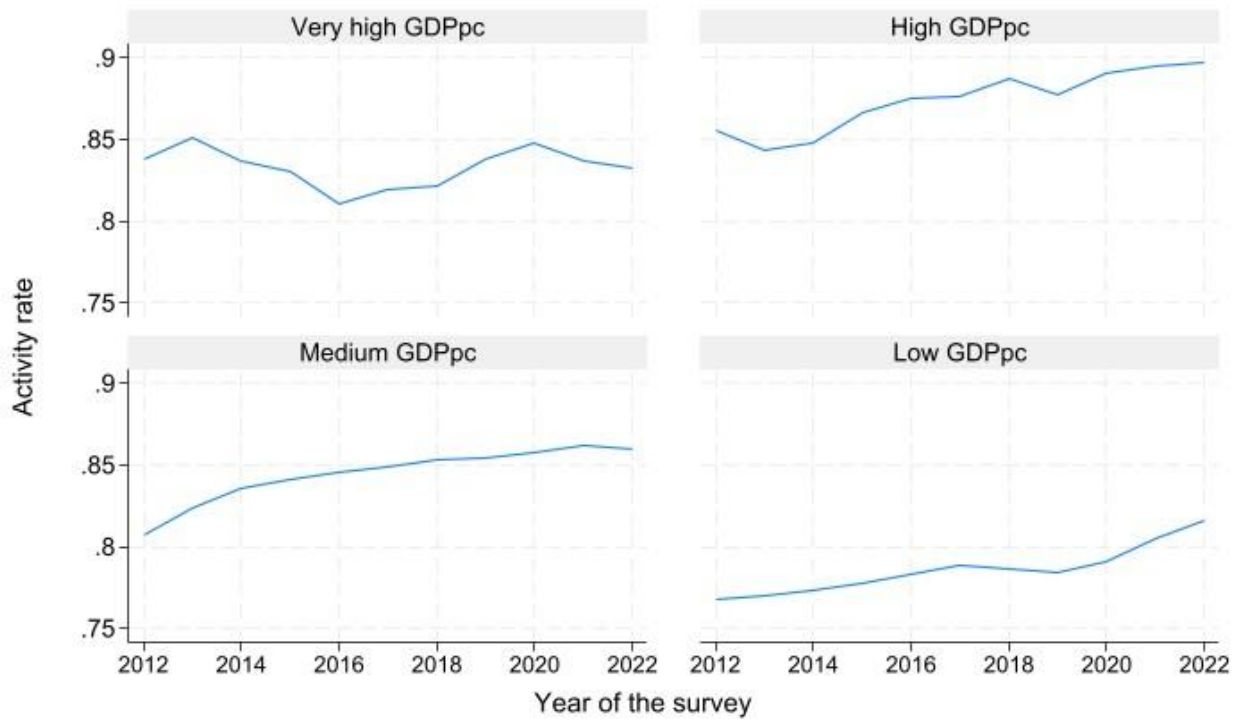
Source: Authors' elaboration on EU-SILC and EUROSTAT data

Figure 4: Employment rates and GDPpc at the regional level
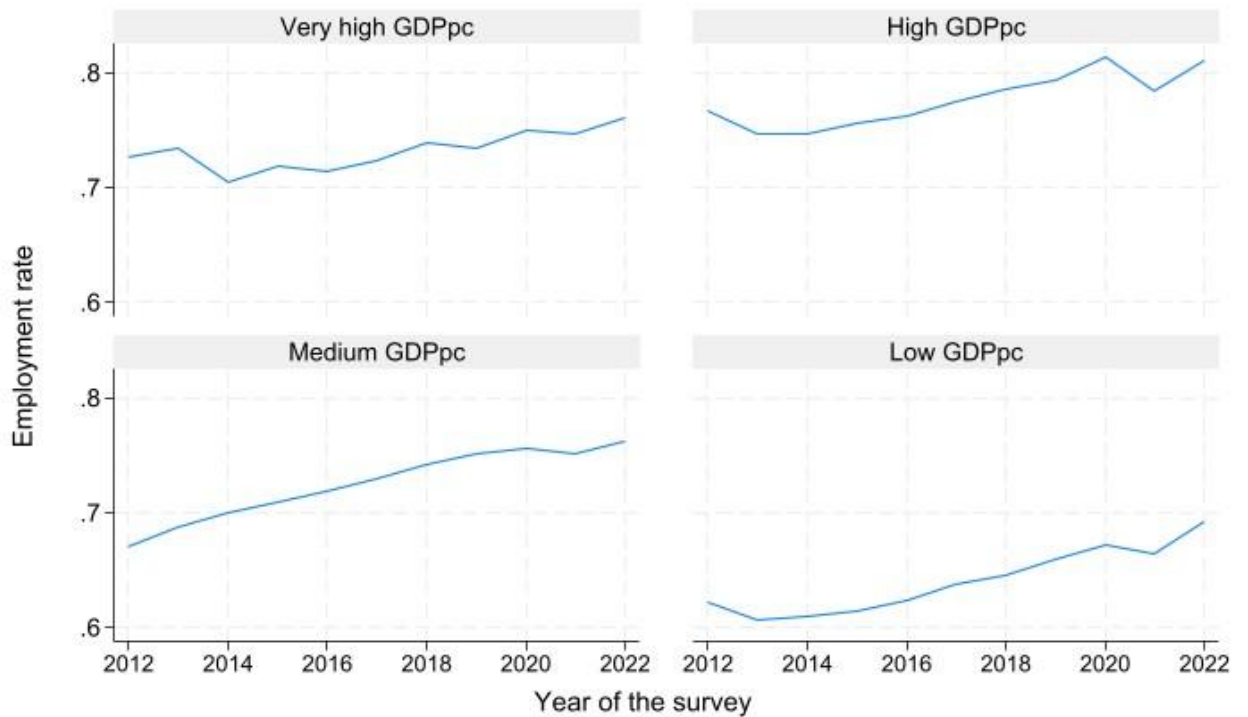
Source: Authors' elaboration on EU-SILC and EUROSTAT data

Lastly, we provide descriptive evidence of how our outcome variables distribute across vulnerable groups and regions. We report activity and employment rates of women, people with long-lasting illness, caregivers, against the ones of males, to give an idea of the difference with what is usually referred to as the most advantaged category in the labor market. There is a clear disparity between regions: in regions with low GDPpc, activity rates for females, people with long-lasting illness, and caregivers are significantly lower compared to those in regions with high or very high GDPpc. Interestingly, women participation rates are higher in regions with High GDPpc than in those with Very High GDPpc. Moreover, while males are the most advantaged group in terms of activity rates across all regions, the gap between males and other categories narrows in regions with higher GDPpc. Carers appear to be the most vulnerable category in terms of labour market participation. Regional disparities are evident also for employment rates: in regions with low GDPpc, female, people with long-lasting illness, and caregiver employment rates are notably lower compared to regions with medium, high, or very high GDPpc, and again, carers appear to be the most vulnerable.

Figure 5: Activity rates for vulnerable groups and regions
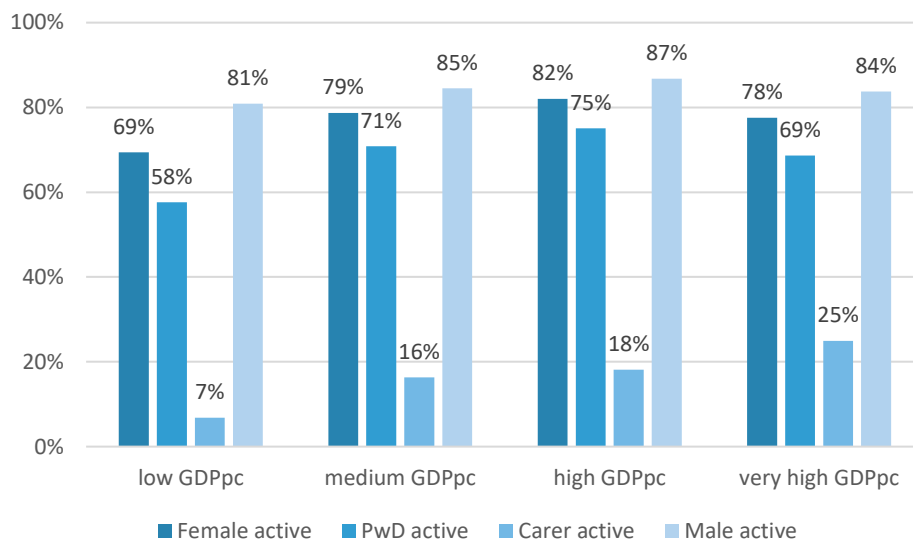
Source: Authors' elaboration on EU-SILC and EUROSTAT data
Note: percentages for each category have been computed with reference to the total population belonging to each of the 4 groups.

Figure 6: Employment rates for vulnerable groups and regions
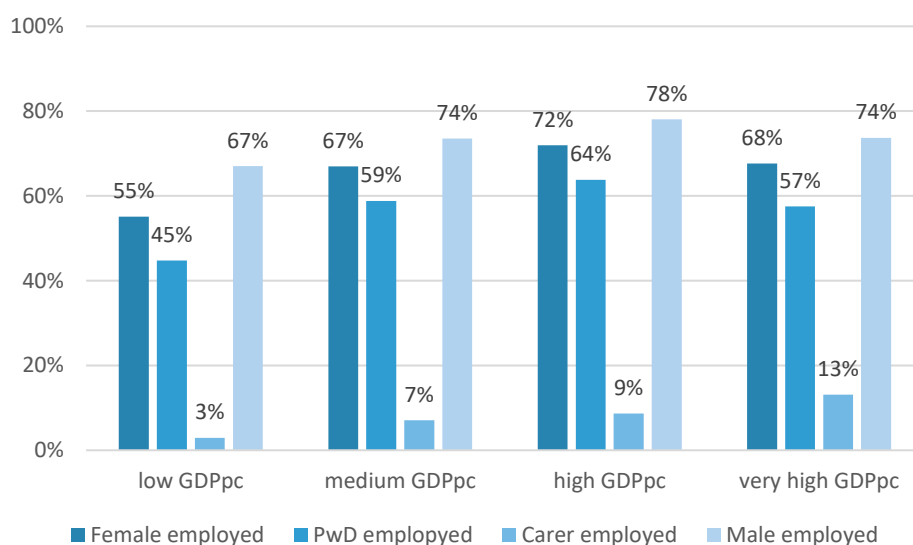
Source: Authors' elaboration on EU-SILC and EUROSTAT data
Note: percentages for each category have been computed with reference to the total population belonging to each of the 4 groups.

Individual determinants

We report here the estimates related to the multilevel models. Although, the regression analysis simultaneously considers both individual and contextual variables, we preferred to present and comment first the effect of individual variables, and then the role of contextual variables. The tables with the complete results are available in the Appendix[1] in Table A 3 and Table A 4.

Table 1: Results for individual level characteristics

VARIABLES	Activity Column 1	Employment Column 2
Age 25-54	-0.823***	0.265***
	(0.021)	(0.058)
Age 55-65	-2.031***	1.340***
	(0.036)	(0.094)
Previous experience	1.711***	2.733***
	(0.033)	(0.042)

[1] We report in the main text only the most complete specification for both outcome variables. In the Appendix we report the whole set of regressions, where we start from the model with only individual level characteristics, and we add one contextual regressor at a time.

Age 25-54*Previous experience		-0.590***	-0.258***
		(0.036)	(0.060)
Age 55-64*Previous experience		-1.016***	-1.201***
		(0.047)	(0.096)
Female		-0.240***	-0.010
		(0.008)	(0.010)
Single parent		0.022	-0.058**
		(0.020)	(0.025)
Couple with children		0.100***	0.112***
		(0.009)	(0.011)
Chronic illness		-1.095***	-0.191***
		(0.008)	(0.011)
Tenure status		-0.337***	0.237***
		(0.010)	(0.013)
Carer		-3.254***	-0.153***
		(0.015)	(0.026)
Towns and suburbs		-0.042***	0.015
		(0.010)	(0.013)
Rural areas		-0.049***	0.036***
		(0.010)	(0.012)
Primary education		0.494***	0.101**
		(0.031)	(0.051)
Lower secondary		0.676***	0.267***
		(0.029)	(0.048)
Upper secondary		0.822***	0.622***
		(0.029)	(0.048)
Post secondary non tertiary		0.871***	0.712***
		(0.037)	(0.056)
Tertiary education		1.066***	0.915***
		(0.030)	(0.049)
Constant		4.698***	-7.819***
		(0.746)	(0.714)
Year FE		YES	YES
Level 2		Region*Year	Region*Year
Level 3		Region	Region

Number of obs	467952	250928

Source: Authors' elaboration on EU-SILC and EUROSTAT data

Note: Coefficients from regression tables are odds ratios. Complete regression tables are provided in the Appendix in Table A 3 and Table A 4.

The first evidence that emerges is that age has different impacts on activity rate and employment. In fact, younger workers tend to be the most active, but at the same time, they tend to be the less likely to have find a job when they look for it. At the same time, having already work experience facilitates both activation and employment. On the other hand, regarding the interactions between age and work experience, the results are not in line with what we expected and need further investigation.

Women are less likely to be active in the labour market but show no significant difference in terms of employment compared to males. This suggests that while women may face barriers to labour market participation, once active and once controlled for other variables, they have similar employment prospects to men[2]. Note also that in our analysis we do not hold against contract types held, nor the part-time, full-time difference, nor contract duration, wage levels etc., where differences between men and women might emerge instead (European Commission, 2023). As per the household type, while being a couple with children is positively correlated with both activation and employment (indicating that the possibility to share duties and responsibilities might act as a supporting factor that facilitates activation and employment), single parents exhibit no significant difference in activation compared to the base category (i.e., couples without children), although they have a significantly lower probability of being employed. This may be probably linked to the barriers this group faces in securing jobs, likely due to caregiving constraints, sectorial segregation etc.

Long-lasting illness[3] and care responsibilities negatively correlate with both outcomes significantly.

Both economic theory and existing evidence (Cesarini et al. 2017, Imbens et al. 2001) suggest that household wealth could be negatively correlated with individual and household labour supply thus resulting in lower activity rates for wealthier people. This is somewhat confirmed by these estimates: homeownership, (here used as a proxy for household wealth levels), is associated with a negative effect on activation although, once active, it has a positive effect on employment. Living in suburbs or rural areas significantly decreases the chances of being active but, once active, it is positively related to the possibility of being employed (probably connected with less competitive labour markets)[4]. However, it should be emphasised that this

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[2] It should be remembered that the analysis is conducted ceteris paribus, so this result should be read in these terms: once active in the labor market, and for the same levels of education, caregiving loads, family type etc., women are just as likely as men to be employed.

[3] In EU-SILC, disability is approximated according to the concept of global activity limitation, which is defined as a limitation – because of health problems – in carrying out usual activities (for at least the previous 6 months). This is not perfectly in line with a social and right-based approach to disability but, nonetheless, is the best proxy we can use.

[4] Higher employment rates in rural areas are in line with what emerges from the Rural Europe EUROSTAT publication (2002): "Almost four out of every five (79.6 %) men aged 20–64 years who were living in rural areas of the EU in 2021 were employed. This was higher than the corresponding shares recorded among

interpretation may not be appropriate for all countries in the sample. For example, Romania has a super homeownership system, in which home ownership is very common, but households often lack the resources to maintain it, ending up with precarious housing conditions (Tufa et al., 2013).

Lastly, consistently with the literature and previous evidence (Gros, 2019; Cairò and Cajner, 2018), education can be considered a strong driver of increased labour force participation and employment: as a matter of facts, the coefficients for education levels consistently show a strong, positive relationship with both labour market activation and employment. Higher education levels, especially tertiary education, significantly increase the likelihood of both activation and employment.

Contextual determinants

Results presented in this subsection provide insight into the effects of the contextual characteristics of the regions where individuals live. Specifically, Column 1 provides insight into these effects on the likelihood of being active in the labour market, whereas Column 2 shows the effect on the probability of being employed, given the individual active participation in the labour market.

Table 2: Results for contextual variables

VARIABLES	Activity Column 1	Employment Column 2
GDPpc mean	-0.572***	0.493***
	(0.087)	(0.079)
GDPpc deviation	0.023	0.748**
	(0.425)	(0.336)
Activity rate mean	0.028***	
	(0.003)	
Activity rate deviation	-0.002	
	(0.003)	
Unemployment rate mean		-0.056***
		(0.004)
Unemployment rate deviation		-0.032***
		(0.009)
Motorway network mean	0.005***	0.001
	(0.001)	(0.001)
Motorway network deviation	0.004	-0.001

men living in towns and suburbs (78.9 %) and in cities (77.5 %)". One of the determinants of this difference, also mentioned in the EUROSTAT report, may be related to the impact of Covid-19, which caused employment rate for cities falling at a faster pace than that for towns and suburbs or rural areas.

	(0.004)	(0.004)
HH index mean	-2.946***	-1.274***
	(0.579)	(0.465)
HH index deviation	-1.209	-0.787
	(2.166)	(2.022)
Tertiary education mean	0.010***	-0.011***
	(0.003)	(0.002)
Tertiary education deviation	0.045***	-0.034***
	(0.011)	(0.010)
Expenditure on ALPM mean	0.259***	0.131***
	(0.022)	(0.022)
Expenditure on ALPM deviation	0.028	0.113**
	(0.053)	(0.049)
Constant	4.698***	-7.819***
	(0.746)	(0.714)
Year FE	YES	YES
Level 2	Region*Year	Region*Year
Level 3	Region	Region
Number of obs	467952	250928

Source: Authors' elaboration on EU-SILC and EUROSTAT data

Note: Coefficients from regression tables are odds ratios. Complete regression tables are provided in the Appendix in Table A 3 and Table A 4.

Starting from the effect of the GDP per capita, which we introduce as a proxy of overall regional economic development, we see that it displays significant but opposite effects on activation and employment. Indeed, everything else being equal, economic development negatively correlates with labour market participation and positively with employment. The fact that, once accounted for the role of other individuals in richer regions are less likely to actively seek participation might suggest a lower need for labour market activation in wealthier regions (in line with the higher activity rates in High GDP regions than Very High GDP regions depicted in Figure 3) but the chances to find a job are higher once individuals are active.

We introduce in the analysis also regional activity rates (Column 1) and unemployment rates (Column 2); both cross-sectional terms are significant and point to the evidence that, *ceteris paribus*, living in a region with higher activity rates and lower unemployment rates increases the likelihood of respectively being active and being employed. Moreover, the effect of unemployment rates is significant also in its longitudinal components: in other words, once considered the effect of other variables, positive (negative) changes in contextual employment rates are associated with parallel variation of individual probability of being employed. Physical infrastructure (here considered as a proxy of regional physical capital endowment) does appear have a significant effect only on activation and not on employment, likely because its influence is mediated by other variables. This is evidenced by the fact that the coefficient is significant in

earlier model specifications but loses significance as additional covariates are introduced (Table A 3 and Table A 4). The Herfindahl-Hirschman Index, which accounts for regional economic diversification, is significant and negative, indicating that regions with less diversified economies (economies where fewer sectors dominate the creation of the total Gross Value Added) face significant challenges in both encouraging labour market and employment (as in Watson and Deller (2017)).

High levels of human capital produce interesting results, as they have significant but opposite impact on the two outcomes, and this holds true both for its cross-sectional and longitudinal components. Results indicate that both human capital stock and human capital flows (proxied by over-time mean and yearly deviations of the prevalence of highly educated individuals at the regional level) are associated with a higher individual probability of being active (as in Di Cataldo and Rodriguez-Pose, 2021). However, once accounted for the role of other variables including individual education level, to live in a context where labour force is in average more educated, is associated with a stronger individual probability of being unemployed probably due to stronger competition (as for example in Van Ours and Ridder, 1995).

Both the cross-sectional and longitudinal components of the expenditure on ALMP show positive effects on activation and employment (in line with Grigoli et al., 2018). Higher and increasing investment in these policies is associated with better labour market outcomes.

Lastly, high levels of inequality are associated with lower labour market participation. Interestingly, the squared term of inequality is positive and significant, showing a non-linear relationship. Therefore, living in a less equal context is associated with a lower probability of being active, but, as the relation is concave, the effect is decreasing and possibly reversed for higher levels of inequality. However, we detect no effect of inequality on employment, suggesting that inequality may stimulate labour market engagement, but it does not directly translate into improved employment outcomes.

Cross-levels effects

As mentioned in the methodology section, our last research question aims to understand whether and the effect of certain individual characteristics may present a heterogeneity linked to the context of life. To investigate this, we interacted three individual-level variables used to identify characteristics somewhat linkable experiencing a higher risk of marginalisation (namely, being a woman, living with a long-lasting illness and having care responsibilities) with a dummy variable that identifies High-Very High GDP regions and Medium-Low GDP ones. Results are presented in Table 3.

Table 3: Results for individual-region interaction effects

	Activity	Employed	Activity	Employed	Activity	Employed
	Interaction with gender	Interaction with gender	Interaction with long-lasting illness	Interaction with long-lasting illness	Interaction with care responsibilities	Interaction with care responsibilities
High GDPpc	0.124*	-0.006	-0.073	0.089	0.000	0.037
	(0.067)	(0.073)	(0.067)	(0.072)	(0.069)	(0.072)

	(1)	(2)	(3)	(4)	(5)	(6)
Female	-0.188***	-0.036***				
	(0.009)	(0.012)				
High GDPpc*Female	-0.154***	0.078***				
	(0.017)	(0.023)				
Long-lasting illness			-1.157***	-0.192***		
			(0.009)	(0.013)		
High GDPpc*Long-lasting			0.232***	-0.159***		
			(0.018)	(0.026)		
Carer					-3.373***	-0.192***
					(0.019)	(0.032)
High GDPpc*Carer					0.368***	-0.019
					(0.034)	(0.058)
Constant	6.238***	-13.605***	6.178***	-13.605***	0.641	-13.622***
	(0.977)	(1.062)	(0.976)	(1.062)	(0.955)	(1.062)
Level 2	Region*Year	Region*Year	Region*Year	Region*Year	Region*Year	Region*Year
Level 3	Region	Region*Year	Region	Region*Year	Region	Region*Year
Number of obs	465,592	214341	465,592	214341	365,929	214341

Source: Authors' elaboration on EU-SILC and EUROSTAT data

Note: Coefficients from regression tables are odds ratios. Complete regression tables are provided in the Appendix in Table A 5 and Table A 6.

Starting from women's situation, what emerges is that (i) women, in general, tend to participate less in the labour market compared to men, coherently with what found in Table 1 and (ii) that women in richer regions are less likely to participate compared to women living in poorer region. However, for employment, the interaction is positive and significant, indicating that women in high GDP regions who are active have a significantly higher chance of securing employment compared to those in lower GDP regions. In other words, regional GDP once interacted with

gender seems to have an effect, *mutatis mutandis*, similar to what observed for household wealth: a reduction in household labour supply more than proportionally involving women. This is not true for employment: on the contrary, living in a wealthier region tend to mitigate the gender related penalty resulting in women's systematically higher net probability of employment[5].

Moreover, in line with what found above, persons with long-lasting illness are significantly less likely to be both active and employed, highlighting the substantial barriers faced in terms of labour market engagement and job retention. What is interesting here is the different impact of the illness condition between the two outcomes according to regional GDP level: the significant and opposite effects of the interaction terms in the activity and employment equations show that individuals with long-lasting illness in high GDP regions are more likely to be active, but less likely to be employed. This suggests that wealthier regions may create better conditions for individuals with long-lasting illness to engage in the labour market, potentially due to a more dynamic labour demand. However, where job market entry barriers are lower, the proportion of persons with long-lasting illness working in less protected sectors is more relevant. This results in a stronger exposure to job related risks such as unemployment.

Lastly, care giving responsibilities show a large negative effect on both activation and employment. If we look to the interaction terms, it appears that wealthier regions provide better conditions or resources (such as childcare services or flexible work arrangements) that help caregivers engage in the labour market. However, the effect on employment is not significant, suggesting that while high GDP regions may encourage greater labour market participation for carers, these regions do not necessarily help them secure employment.

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[5] This is further confirmed by the fact that, when we examine the interaction between gender and a more granular definition of regional GDP (e.g. a four-level categorical variable instead of a dichotomous one), a more complex and nuanced effect emerge. Regions where women are significantly less active are those on the extreme wings of the distribution. In low GDP regions, the crowding out effect may be linked to demand side constraints: in absence of job opportunities and effective support mechanisms, the low probability of actually being employed may push women toward inactivity. In very high-income regions this effect is likely to be due to a reduction in household level supply that tend to involve women more than proportionally. To explore the reasons behind this gender related asymmetry could be a further development of this research.

Conclusions

This working paper sheds light on the multidimensional and multilevel articulation of the social and economic mechanisms that shape individual's access to the job market and employment carriers. Our study offers new empirical insights into the determinants of labour market participation and employment across EU member states, with a specific focus on the experiences of vulnerable groups. By leveraging an extremely comprehensive dataset, spanning 28 countries over 13 years, with a NUTS1/NUTS2 disaggregation, and employing a three-level multilevel model, we provide an in-depth analysis of how individual and contextual factors, and their interactions, shape labour market dynamics in the EU.

First, coherently with the Capability Approach, our findings confirm the significant influence of individual conversion factors summarised by characteristics such as age, education, gender, long-lasting illness, and care responsibilities on labour market outcomes. For example, young people tend to activate more than the older, but they find more difficulties in finding job when they actively look for it. Having previous work experience help in both activity and employment, while long-lasting illness and care responsibilities negatively correlate with both outcomes significantly. Higher education levels, especially tertiary education, consistently correlate with increased labour market activation and employment.

Second, beyond individual characteristics, our analysis underscores the critical role that contextual factors play in shaping labour market dynamics. We find that, everything else being equal, living in a region with high levels of activation and employment increases the chances of being respectively active and employed. In the same way, once controlled for individual characteristics, living in a region with high levels of human capital or a highly diversified economic structure exert substantial influence on labour market outcomes. Also, our study highlights the importance of ALMP in promoting labour market participation and employment. Increased investment in ALMPs proves to be a crucial factor in mitigating the risks of long-term detachment from the labour market.

One of the key contributions of our work is the understanding of how individual characteristics, such as gender, long-lasting illness, and caregiving responsibilities, often predictors of higher risk of marginalisation on the job market, can have heterogenous effects varying according to the economic context in which individuals live. For example, women living in wealthier regions, while less likely to participate in the labour market, tend to have better employment prospects once active. Conversely, individuals with long-lasting illness are more likely to be active in wealthier regions, but lower barriers to labour market access in these regions increase the competition in those markets, lowering employment prospects for people with long-lasting illness compared to those in lower GDP regions. Again, different local contexts require different policy approaches.

Another interesting contribution emerging from our results is how some of the predictors of both activity and employment, at both individual and contextual levels, as well as their interactions, have different effects on activity compared to employment. For example, single parents appear not to experience particular difficulties in entering into the labour market, but they significantly struggle transitioning from activation to actual employment. This implies that tailored policies are needed for each of these two dimensions: to promote employment, it is necessary to first promote activity, but the pathways leading to the two outcomes may not necessarily overlap. By recognizing and addressing the complex interplay of individual vulnerabilities and regional economic conditions, future labour market interventions can more effectively promote inclusion and social cohesion across the European Union.

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PATHS 2 INCLUDE

Appendix

Table A 1: Number of observations by country and NUTS level

Country alphanumeric	NUTS Level			
	0	1	2	Total
AT	0	99517	0	99517
BE	0	104838	0	104838
BG	0	111895	0	111895
CY	0	83785	0	83785
CZ	0	0	131715	131715
DK	0	91241	0	91241
EE	0	104784	0	104784
EL	0	199801	0	199801
ES	0	0	278728	278728
FI	29	0	194807	194836
FR	20139	0	172015	192154
HR	0	116455	3540	119995
HU	0	149259	0	149259
IE	0	80762	0	80762
IT	0	311352	0	311352
LT	0	83856	0	83856
LU	0	83449	0	83449
LV	0	97372	0	97372
MT	0	71247	0	71247
NL	193641	0	0	193641
NO	29	91469	0	91498
PL	0	252707	0	252707
PT	85365	0	81440	166805
RO	8	128178	0	128186
SE	0	117327	0	117327
SI	66880	123493	0	190373
SK	0	114623	0	114623
Total	366091	2617410	862245	3845746

Source: Authors' elaboration on EU-SILC and EUROSTAT data

Table A 2: Summary statistics of variables used in the analysis

Variable	Mean	Std. Dev.	Min	Max
Age categories				
15-24	.069	.253	0	1
25-54	.66	.474	0	1
55-64	.271	.444	0	1
Female	.511	.5	0	1
Household type				
Single/Couple without children	.505	.5	0	1
Single parent	.03	.171	0	1
Couple with one or more children	.465	.499	0	1
Chronic illness	.258	.438	0	1
Past work experience	.793	.405	0	1
Domestic tasks and care	.064	.244	0	1
Tenure status	.847	.36	0	1
Rural				
Cities	.36	.48	0	1
Towns and suburbs	.273	.445	0	1
Rural areas	.367	.482	0	1
Educational level				
No education	.007	.086	0	1
Primary education	.063	.242	0	1

Lower secondary	.163	.369	0	1
Upper secondary	.45	.498	0	1
Post-secondary non tertiary	.034	.182	0	1
Tertiary education	.283	.45	0	1
GDP per capita (ln)	10.138	.392	9.069	11.418
Activity rate	76.937	8.789	46.4	100
Unemployment rate	9.316	5.645	1.2	37
Motorway network (Km/ thousand	25.628	22.155	0	98
HH index	.376	.049	.277	.548
Tertiary education	0.315	0.09	0.11	0.55
Total expenditure on ALMP (%GDP)	1.664	.995	.071	4.56

Source: Authors' elaboration on EU-SILC and EUROSTAT data

Table A 3: Labour market participation complete regressions

VARIABLES	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7
Age 25-54	-0.496***	-0.485***	-0.543***	-0.543***	-0.561***	-0.559***	-0.823***
	(0.014)	(0.017)	(0.018)	(0.018)	(0.019)	(0.019)	(0.021)
Age 55-65	-1.767***	-1.790***	-1.736***	-1.736***	-1.788***	-1.785***	-2.031***
	(0.027)	(0.031)	(0.033)	(0.033)	(0.035)	(0.035)	(0.036)
Previous experience	1.891***	1.856***	1.969***	1.969***	1.983***	1.987***	1.711***
	(0.024)	(0.027)	(0.030)	(0.030)	(0.032)	(0.032)	(0.033)
Age 25-54*Previous experience	-0.818***	-0.786***	-0.836***	-0.836***	-0.837***	-0.840***	-0.590***
	(0.026)	(0.030)	(0.033)	(0.033)	(0.035)	(0.035)	(0.036)
Age 55-64*Previous experience	-1.336***	-1.253***	-1.294***	-1.294***	-1.237***	-1.239***	-1.016***
	(0.035)	(0.039)	(0.043)	(0.043)	(0.045)	(0.045)	(0.047)
Female	-0.192***	-0.176***	-0.202***	-0.202***	-0.209***	-0.208***	-0.240***
	(0.006)	(0.007)	(0.007)	(0.007)	(0.008)	(0.008)	(0.008)
Single parent	0.050***	0.001	0.040**	0.040**	0.018	0.018	0.022
	(0.016)	(0.018)	(0.019)	(0.019)	(0.020)	(0.020)	(0.020)
Couple with children	0.131***	0.089***	0.112***	0.112***	0.091***	0.091***	0.100***
	(0.007)	(0.008)	(0.008)	(0.008)	(0.009)	(0.009)	(0.009)
Chronic illness	-1.144***	-1.118***	-1.092***	-1.092***	-1.086***	-1.088***	-1.095***
	(0.006)	(0.007)	(0.007)	(0.007)	(0.008)	(0.008)	(0.008)

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Tenure status	-0.374***	-0.360***	-0.350***	-0.350***	-0.342***	-0.342***	-0.337***
	(0.008)	(0.009)	(0.009)	(0.009)	(0.010)	(0.010)	(0.010)
Carer	-3.482***	-3.481***	-3.294***	-3.294***	-3.285***	-3.285***	-3.254***
	(0.011)	(0.012)	(0.013)	(0.013)	(0.014)	(0.014)	(0.015)
Towns and suburbs	-0.028***	-0.028***	-0.033***	-0.033***	-0.036***	-0.035***	-0.042***
	(0.007)	(0.009)	(0.009)	(0.009)	(0.010)	(0.010)	(0.010)
Rural areas	-0.015**	-0.023***	-0.038***	-0.038***	-0.044***	-0.043***	-0.049***
	(0.007)	(0.008)	(0.009)	(0.009)	(0.009)	(0.009)	(0.010)
Primary education	0.576***	0.592***	0.546***	0.546***	0.530***	0.530***	0.494***
	(0.022)	(0.027)	(0.029)	(0.029)	(0.030)	(0.030)	(0.031)
Lower secondary	0.684***	0.715***	0.675***	0.675***	0.664***	0.664***	0.676***
	(0.022)	(0.026)	(0.028)	(0.028)	(0.029)	(0.029)	(0.029)
Upper secondary	0.788***	0.824***	0.778***	0.778***	0.769***	0.769***	0.822***
	(0.022)	(0.026)	(0.028)	(0.028)	(0.029)	(0.029)	(0.029)
Post secondary non tertiary	0.922***	0.977***	0.886***	0.886***	0.860***	0.858***	0.871***
	(0.026)	(0.030)	(0.034)	(0.034)	(0.036)	(0.036)	(0.037)
Tertiary education	1.003***	1.049***	1.067***	1.067***	1.050***	1.049***	1.066***
	(0.022)	(0.027)	(0.029)	(0.029)	(0.029)	(0.029)	(0.030)
GDPpc mean		-0.345***	-0.561***	-0.561***	-0.336***	-0.709***	-0.572***
		(0.059)	(0.066)	(0.066)	(0.086)	(0.089)	(0.087)
GDPpc deviation		0.037	-0.132	-0.132	-0.451	-0.340	0.023
		(0.401)	(0.419)	(0.419)	(0.461)	(0.435)	(0.425)
Activity rate		0.018***	0.025***	0.025***	0.019***	0.014***	0.028***
		(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)

Activity rate	-0.001	-0.002	-0.002	-0.003	-0.003	-0.002	
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	
Motorway network mean		0.006***	0.006***	0.008***	0.006***	0.005***	
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	
Motorway network deviation		0.007	0.007	0.004	0.003	0.004	
		(0.004)	(0.004)	(0.005)	(0.004)	(0.004)	
HH index mean				-3.007***	-3.151***	-2.946***	
				(0.644)	(0.612)	(0.579)	
HH index deviation				-0.538	-1.543	-1.209	
				(2.416)	(2.291)	(2.166)	
Tertiary education mean					0.024***	0.010***	
					(0.003)	(0.003)	
Tertiary education deviation					0.042***	0.045***	
					(0.012)	(0.011)	
Expenditure on ALPM mean						0.259***	
						(0.022)	
Expenditure on ALPM deviation						0.028	
						(0.053)	
Constant	0.454***	2.919***	4.442***	4.442***	3.712***	7.055***	4.698***
	(0.074)	(0.566)	(0.625)	(0.625)	(0.689)	(0.752)	(0.746)
Year FE	YES	YES	YES	YES	YES	YES	YES
Level 2	Region* Year	Region* Year	Region* Year	Region* Year	Region* Year	Region* Year	Region* Year
Level 3	Region	Region	Region	Region	Region	Region	Region
Number of obs	952934	689941	557746	557746	498942	497783	467952

Source: Authors' elaboration on EU-SILC and EUROSTAT data

Note: Coefficients from regression tables are odds ratios.

PATHS 2 INCLUDE

Table A 4: Employment complete regressions

	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7
VARIABLES							
Age 25-54	0.292***	0.296***	0.300***	0.348***	0.246***	0.245***	0.265***
	(0.049)	(0.052)	(0.052)	(0.053)	(0.057)	(0.057)	(0.058)
Age 55-65	1.479***	1.371***	1.377***	1.365***	1.364***	1.364***	1.340***
	(0.082)	(0.087)	(0.087)	(0.089)	(0.094)	(0.094)	(0.094)
Previous experience	2.984***	2.929***	2.933***	2.838***	2.794***	2.794***	2.733***
	(0.036)	(0.039)	(0.039)	(0.040)	(0.042)	(0.042)	(0.042)
Age 25-54*Previous experience	-0.341***	-0.318***	-0.318***	-0.351***	-0.252***	-0.252***	-0.258***
	(0.051)	(0.054)	(0.054)	(0.055)	(0.059)	(0.059)	(0.060)
Age 55-64*Previous experience	-1.363***	-1.228***	-1.233***	-1.222***	-1.225***	-1.226***	-1.201***
	(0.083)	(0.089)	(0.089)	(0.090)	(0.095)	(0.095)	(0.096)
Female	-0.002	0.001	0.001	0.002	-0.006	-0.006	-0.010
	(0.008)	(0.008)	(0.008)	(0.009)	(0.010)	(0.010)	(0.010)
Single parent	-0.050**	-0.050**	-0.055**	-0.082***	-0.068***	-0.067***	-0.058**
	(0.020)	(0.022)	(0.022)	(0.023)	(0.025)	(0.025)	(0.025)
Couple with children	0.127***	0.116***	0.116***	0.110***	0.111***	0.111***	0.112***
	(0.008)	(0.009)	(0.009)	(0.010)	(0.010)	(0.010)	(0.011)
Chronic illness	-0.200***	-0.191***	-0.195***	-0.202***	-0.192***	-0.191***	-0.191***
	(0.009)	(0.009)	(0.009)	(0.010)	(0.011)	(0.011)	(0.011)
Tenure status	0.219***	0.200***	0.199***	0.222***	0.217***	0.217***	0.237***
	(0.010)	(0.011)	(0.011)	(0.012)	(0.012)	(0.012)	(0.013)
Carer	-0.137***	-0.138***	-0.151***	-0.194***	-0.183***	-0.183***	-0.153***
	(0.020)	(0.022)	(0.022)	(0.023)	(0.025)	(0.025)	(0.026)
Towns and suburbs	0.035***	0.027**	0.020*	0.028**	0.033***	0.033***	0.015
	(0.010)	(0.011)	(0.011)	(0.012)	(0.012)	(0.012)	(0.013)
Rural areas	0.022**	0.029***	0.024**	0.047***	0.050***	0.050***	0.036***
	(0.010)	(0.011)	(0.011)	(0.011)	(0.012)	(0.012)	(0.012)
Primary education	0.168***	0.177***	0.162***	0.131***	0.122**	0.123**	0.101**
	(0.043)	(0.046)	(0.046)	(0.048)	(0.050)	(0.050)	(0.051)
Lower secondary	0.276***	0.279***	0.260***	0.269***	0.267***	0.268***	0.267***
	(0.041)	(0.044)	(0.044)	(0.046)	(0.047)	(0.047)	(0.048)

PATHS2INCLUDE

Upper secondary	0.596***	0.610***	0.579***	0.603***	0.611***	0.612***	0.622***
	(0.041)	(0.044)	(0.044)	(0.046)	(0.047)	(0.047)	(0.048)
Post secondary non tertiary	0.689***	0.684***	0.656***	0.693***	0.682***	0.683***	0.712***
	(0.045)	(0.049)	(0.049)	(0.052)	(0.054)	(0.054)	(0.056)
Tertiary education	0.930***	0.931***	0.905***	0.902***	0.905***	0.907***	0.915***
	(0.042)	(0.045)	(0.045)	(0.046)	(0.048)	(0.048)	(0.049)
GDPpc mean		0.619***	0.379***	0.349***	0.422***	0.517***	0.493***
		(0.038)	(0.044)	(0.054)	(0.066)	(0.079)	(0.079)
GDPpc deviation		0.927***	0.787***	0.488*	0.679**	0.588*	0.748**
		(0.242)	(0.276)	(0.294)	(0.327)	(0.327)	(0.336)
Unemployment rate			-0.054***	-0.050***	-0.046***	-0.045***	-0.056***
			(0.002)	(0.003)	(0.003)	(0.003)	(0.004)
Unemployment rate			-0.017**	-0.014*	-0.028***	-0.027***	-0.032***
			(0.008)	(0.008)	(0.009)	(0.008)	(0.009)
Motorway network mean				0.001	0.001	0.002	0.001
				(0.001)	(0.001)	(0.001)	(0.001)
Motorway network deviation				-0.002	-0.002	-0.001	-0.001
				(0.004)	(0.005)	(0.005)	(0.004)
HH index mean					-1.096**	-1.220***	-1.274***
					(0.471)	(0.470)	(0.465)
HH index deviation					-1.400	-0.923	-0.787
					(2.054)	(2.048)	(2.022)
Tertiary education mean						-0.005**	-0.011***
						(0.002)	(0.002)
Tertiary education deviation						-0.029***	-0.034***
						(0.010)	(0.010)
Expenditure on ALPM mean							0.131***
							(0.022)
Expenditure on ALPM deviation							0.113**
							(0.049)

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Constant	-4.166***	-10.525***	-7.552***	-7.085***	-7.580***	-8.238***	-7.819***
	(0.083)	(0.387)	(0.466)	(0.556)	(0.610)	(0.710)	(0.714)
Year FE	YES	YES	YES	YES	YES	YES	YES
Level 2	Region*Year	Region*Year	Region*Year	Region*Year	Region*Year	Region*Year	Region*Year
Level 3	Region	Region	Region	Region	Region	Region	Region
Number of obs	411906	356001	353053	297772	264649	264649	250928

Source: Authors' elaboration on EU-SILC and EUROSTAT data

Note: Coefficients from regression tables are odds ratios.

Table A 5: Labour market participation complete regressions with interactions

VARIABLES	Interaction with female	Interaction with long-lasting illness	Interaction with care burden
Age 25-54	-0.812***	-0.814***	-0.805***
	(0.021)	(0.021)	(0.023)
Age 55-65	-2.021***	-2.020***	-2.026***
	(0.036)	(0.036)	(0.041)
Previous experience	1.721***	1.717***	1.711***
	(0.033)	(0.033)	(0.037)
Age 25-54*Previous experience	-0.597***	-0.596***	-0.587***
	(0.036)	(0.036)	(0.041)
Age 55-64*Previous experience	-1.024***	-1.021***	-0.913***
	(0.047)	(0.047)	(0.052)
Female	-0.188***	-0.229***	-0.225***
	(0.009)	(0.008)	(0.009)
High GDPpc	0.124*	-0.073	0.000
	(0.067)	(0.067)	(0.069)
Single parent	0.044**	0.038*	0.040*
	(0.020)	(0.020)	(0.023)
Couple with children	0.106***	0.106***	0.107***
	(0.009)	(0.009)	(0.010)
Chronic illness	-1.097***	-1.157***	-1.086***
	(0.008)	(0.009)	(0.009)
Tenure status	-0.338***	-0.334***	-0.343***
	(0.010)	(0.010)	(0.011)
Carer	-3.270***	-3.270***	-3.373***

	(0.015)	(0.015)	(0.019)
Towns and suburbs	-0.041***	-0.041***	-0.045***
	(0.010)	(0.010)	(0.011)
Rural areas	-0.048***	-0.049***	-0.058***
	(0.010)	(0.010)	(0.011)
Primary education	0.487***	0.480***	0.459***
	(0.031)	(0.031)	(0.033)
Lower secondary	0.672***	0.668***	0.667***
	(0.029)	(0.029)	(0.030)
Upper secondary	0.819***	0.815***	0.813***
	(0.029)	(0.029)	(0.030)
Post secondary non tertiary	0.875***	0.871***	0.879***
	(0.037)	(0.037)	(0.039)
Tertiary education	1.061***	1.058***	1.051***
	(0.030)	(0.030)	(0.031)
GDP per capita	-0.544***	-0.531***	0.088
	(0.105)	(0.105)	(0.098)
Activity rate	0.011***	0.011***	0.010***
	(0.002)	(0.002)	(0.002)
Motorways network	0.005***	0.005***	0.002
	(0.001)	(0.001)	(0.001)
Herfindahl-Hirschman index	-4.045***	-4.064***	-4.290***
	(0.549)	(0.548)	(0.565)
Tertiary education	0.017***	0.017***	0.017***
	(0.003)	(0.003)	(0.003)
Total expenditure on ALMP (% GDP)	0.196***	0.194***	0.201***
	(0.021)	(0.021)	(0.022)
Female*High GDPpc	-0.154***		
	(0.017)		
Long-lasting illness*High GDPpc		0.232***	
		(0.018)	
Carer*High GDPpc			0.368***
			(0.034)
Constant	6.238***	6.178***	0.641
	(0.977)	(0.976)	(0.955)

D7.1 Assessing the determinants of labour market inclusion for vulnerable European citizens: an eco-systemic and multi-level approach

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PATHS 2 INCLUDE

	Interaction with female	Interaction with long-lasting illness	Interaction with care burden
Year FE	YES	YES	YES
Level 2	Region*Year	Region*Year	Region*Year
Level 3	Region	Region	Region
Number of obs	465592	465592	365929

Source: Authors' elaboration on EU-SILC and EUROSTAT data

Note: Coefficients from regression tables are odds ratios.

Table A 6: Employment complete regressions with interactions

VARIABLES	Interaction with female	Interaction with long-lasting illness	Interaction with care burden
Age 25-54	0.328***	0.332***	0.328***
	(0.061)	(0.061)	(0.061)
Age 55-65	1.354***	1.357***	1.353***
	(0.099)	(0.099)	(0.099)
Previous experience	2.653***	2.657***	2.653***
	(0.044)	(0.044)	(0.044)
Age 25-54*Previous experience	-0.269***	-0.272***	-0.270***
	(0.063)	(0.063)	(0.063)
Age 55-64*Previous experience	-1.165***	-1.170***	-1.164***
	(0.101)	(0.101)	(0.101)
Female	-0.036***	-0.016	-0.016
	(0.012)	(0.011)	(0.011)
High GDPpc	-0.006	0.089	0.037
	(0.073)	(0.072)	(0.072)
Single parent	-0.052**	-0.049*	-0.050*
	(0.026)	(0.026)	(0.026)
Couple with children	0.120***	0.119***	0.119***
	(0.012)	(0.012)	(0.012)
Chronic illness	-0.233***	-0.192***	-0.233***
	(0.012)	(0.013)	(0.012)
Tenure status	0.250***	0.249***	0.250***
	(0.013)	(0.013)	(0.013)
Carer	-0.199***	-0.199***	-0.192***
	(0.027)	(0.027)	(0.032)

Towns and suburbs	0.040***	0.041***	0.040***
	(0.014)	(0.014)	(0.014)
Rural areas	0.067***	0.068***	0.067***
	(0.014)	(0.014)	(0.014)
Primary education	0.095*	0.097*	0.094*
	(0.056)	(0.056)	(0.056)
Lower secondary	0.239***	0.240***	0.238***
	(0.053)	(0.053)	(0.053)
Upper secondary	0.595***	0.595***	0.594***
	(0.053)	(0.053)	(0.053)
Post secondary non tertiary	0.670***	0.671***	0.670***
	(0.061)	(0.061)	(0.061)
Tertiary education	0.865***	0.865***	0.864***
	(0.053)	(0.053)	(0.053)
GDP per capita	1.053***	1.050***	1.054***
	(0.114)	(0.114)	(0.114)
Activity rate	0.003	0.003	0.003
	(0.003)	(0.003)	(0.003)
Motorways network	-0.004***	-0.004***	-0.004***
	(0.001)	(0.001)	(0.001)
Herfindahl-Hirschman index	-1.505**	-1.494**	-1.504**
	(0.600)	(0.600)	(0.600)
Tertiary education	-0.017***	-0.017***	-0.017***
	(0.003)	(0.003)	(0.003)
Total expenditure on ALMP (% GDP)	-0.035	-0.034	-0.035
	(0.023)	(0.023)	(0.023)
Female*High GDPpc	0.078***		
	(0.023)		
Long-lasting illness*High GDPpc		-0.159***	
		(0.026)	
Carer*High GDPpc			-0.019
			(0.058)
Constant	-13.605***	-13.605***	-13.622***
	(1.062)	(1.062)	(1.062)
Year FE	YES	YES	YES

PATHS 2 INCLUDE

	Region*Year	Region*Year	Region*Year
Level 2	Region*Year	Region*Year	Region*Year
Level 3	Region	Region	Region
Number of obs	214341	214341	214341

Source: Authors' elaboration on EU-SILC and EUROSTAT data

Note: Coefficients from regression tables are odds ratios.

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