

Breaking the Divide: Can Public Spending on Social Infrastructure Boost Female Employment in Italy?¹

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Jelena Reljic^a and Francesco Zezza^{a,b,*}

^a Sapienza University of Rome

^b Levy Economics Institute of Bard College

* Corresponding author: francesco.zezza@uniroma1.it

Abstract

Recent financial crises have had devastating effects on living conditions in Europe, with the most vulnerable groups paying the higher price in terms of employment over the last decade. Increasing precariousness particularly affects young people, immigrants, and women, but the latter suffer more from cuts in social spending: less availability of early childhood services, the burden of imbalance in the distribution of domestic work within the family, the lack of flexibility in the organization of work, all make it particularly difficult to reconcile work-life balance for women. Investing in “social infrastructure” is therefore on the agenda of most European governments.

To assess the effects of fiscal policies on inclusiveness in local labour market in Italy we rely on a unique database (“Conti Pubblici Territoriali”) providing information on public spending broken down by category, economic sector, institutional level, and region. We adopt the SVAR analysis, building on the works of Zezza and Guarascio (2023) and Akitoby et al. (2019). We find that, although public spending in social infrastructure yields positive outcomes in terms of output growth and crowding-in of private investment in all areas of the country, the effects on gender employment gap display great regional heterogeneity. This implies that one-size-fits-all kind of policy is not necessarily effective but should instead be designed accounting for regional specificities.

Keywords: Social infrastructure; Gender inequality; Fiscal Policy; Panel SVAR; Italian regions.

JEL: C33; E24; E62; J16; R58

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1. Introduction

The financial crisis and the ongoing COVID-19 pandemic have both had devastating effects on living and working conditions in Europe, particularly in the southern periphery (Portugal, Italy, Greece, and Spain). In response to the crisis of 2008, these countries turned to austerity agendas, which led to significant cuts in social spending (Piacentini et al., 2016; Zezza, 2020), along with further deregulation of the labour market (Cirillo et al., 2017; Reljic et al., 2023). Nevertheless, these policies have failed to deliver the hoped-for effects in terms of growth. Quite the contrary, this internal devaluation strategy has further exacerbated the existing core-periphery divides both between and within countries in the EU (Celi et al., 2019).

In this context, the fragmentation and precariousness of the labour market have disproportionately affected vulnerable workers, such as youth, immigrants, and women. The latter, in particular, have been further penalized by public spending cuts in the social infrastructure services – including education, health care, childcare, and social assistance (Oyvat and Önarar 2020). On the labour demand side, the social sector - which tend to employ more women than men - has been crippling as a consequence of fiscal consolidation, limiting employment opportunities for women (León and Pavolini, 2014; Pavolini et al., 2015). On the labour supply side, given the unequal distribution of unpaid care work women borne within families, the inadequate provision of essential public care services (both for children and elderly) has put additional burden on their participation in the labour market (Chiericato, 2021; Pacelli et al., 2013). The effects of the COVID-19 pandemic and lockdown measures have further accentuated the enduring gender gaps (Cetrulo et al., 2022).

So far, the literature evolved along different lines of research to investigate the role of government spending in shaping female labour market outcomes. The effects of fiscal policy on gender inequality have been examined at micro, sectoral and macro level. The evidence from impact evaluation studies is vast. While these allow for higher level of detail on the labour supply side, their findings often remain silent on net aggregate

effects, and more-than-often suffer from external validity (Ernst et al., 2022). Another line of research focused on the impact of government spending on “social infrastructure” by employing input-output tables (De Henau and Himmelweit, 2020; Ilkharacan et al., 2021, among others). Sectoral studies have the advantage of accounting for structural and institutional characteristics, albeit at the expense of the longitudinal dimension. The less investigated angle of this nexus is its territorial perspective, which is crucial in countries characterised by marked regional inequalities. To address this research gap, we bring together two strands of the literature: the contributions analysing the employment impact of public spending on social infrastructure (Oyvat and Önar, 2020) and those focusing on structural polarisation and core-periphery divides (Accetturo et al. 2022; Celi et al. 2018; Gräbner et al. 2020).

The Italian context is an interesting case for investigation, not only because it stands out as one of the worst performers in the European Union regarding gender parity in the labour market, but also due to the significant within-country differences (Hoffmann et al., 2021). In 2021, Italy emerged as the second-worst performer in the EU in terms of female employment (49,4%) and inactivity rate (44,6%), followed by only Greece and Romania respectively. The situation is even worse in the southern regions, including Sicily and Calabria, where female employment rate still stands below 30%.

In this vein, the present study focuses on regional labour markets in Italy and aims to investigate the effects of public spending on social infrastructure on female employment. We build upon the work of Akitoby et al. (2019) and Zezza and Guarascio (2023), and estimate two five-variable panel structural vector autoregressive (P-SVAR) models with regional fixed effects, which includes both monetary (i.e., public spending in the social sector, private investment, and GDP) and employment variables (i.e., total employment, the female share of total employment, and the female labor force participation rate).

Our study reveals a positive and long-lasting impact of social expenditure on private investment, GDP, and employment. While the employment effect of social spending is

similar across regions despite structural differences (but magnitudes are different), the effect on the gender employment gap is favourable only in the South, areas with lower quality of public services and underlying chronic underinvestment in social infrastructures, as well as more disadvantaged labour market conditions. Nevertheless, these positive effects reverse the sign after three years, indicating that structural weaknesses prevail in the medium-to-long term.

Our findings deliver some important policy implications, especially in light of the National Recovery and Resilience Plan of the Italian Government. On the one hand, given that we find that public spending on social infrastructure sustains the private initiative, crowding in private investment and expanding output, the forty percent of NRRP resources allotted to Mezzogiorno may reduce (at least partly) the long-standing core-periphery divide. On the other hand, the NRRP resources assigned to reduce gender disparities may in contrast not be sufficient. Thus, more structural policy actions, such as long-term investment in social infrastructure, rather than one-off measures, are needed to lift the barriers women face in the labour market, ultimately favouring regional convergence.

The rest of the paper is organized as follows. Section 2 reviews the literature on fiscal policy and female labor markets, on the one hand, and the one on fiscal multipliers on the other. Section 3 presents the data used in the empirical analysis, and discusses the methodology adopted. Results of our empirical exercise are shown and discussed in Section 4. Section 5 concludes.

2. Literature review

2.1. Fiscal policy and female labor markets

The impact of fiscal policies on female labour market outcomes depends on various sources of heterogeneity, although positive effects seem to prevail, especially in cross-country analyses (see Olivetti and Petrongolo, 2017, for a review). In terms of policy

measures, studies either emphasised the role of specific policies in isolation (e.g., childcare enrolment) or they focused on more aggregate fiscal stimulus.

[...]

Our study differs in some important respects from the IMF work. First, while they use aggregate cross-country data for X advanced countries (...), we rely instead on data for Italian regions from the Public Territorial Accounts (PTA, more on which will be said in Section 3). Second, while they concentrate on total fiscal expenditures (net of interest payments and transfers), the aim of our study is to disentangle the role of expenditures in social infrastructures, and thus our fiscal variable only covers a small proportion of expenditures.

2.2. Fiscal multipliers

In recent years, there has been a Renaissance in fiscal research – to use the words of Ramey (2019) –, and more generally on the study of the macroeconomic impact of government spending (Batini et al., 2014). A vast literature employs Structural Vector Autoregressive (SVAR) models², adopting different identification schemes (see Caldara and Kamps, 2017 for a review).

Meta-analysis of the literature have shown that multipliers for government spending are generally positive (ranging between 0.5 and 1), with the investment component having the higher value, followed by public purchases and transfers (Gechert, 2015; Ramey, 2019). However, the magnitude of multipliers varies according to (i) the model adopted, (ii) the country under study, (iii) the time horizon, and (iv) the data used to define the fiscal variables.³ Moreover, the size and degree of persistence of fiscal

² Another widely adopted methodology is the Local Projections approach pioneered by Jordà (2005) and integrated into SVAR analysis (Auerbach and Gorodnichenko, 2017). However, recent studies show that the two methodologies produce the same IRFs, and are equally robust to non-linearities (Plagborg-Møller and Wolf, 2021).

³ The last point is particularly important when it comes to SVAR models. Here, one of the main issues stems indeed from the potential endogeneity of public spending due to automatic stabilizers. This

multipliers may be affected by the structural characteristics of the economy under study. Indeed, the size of fiscal multipliers turns out to depend upon: (i) industrial development; (ii) the exchange rate regime; (iii) the degree of openness to trade; (iv) the size of public debt (Ilzetzki et al., 2013).

Labor market characteristics also play a pivotal role. On the one hand, Cole and Ohanian (2004) and Gorodnichenko et al. (2012) show that the more rigid is the labour market the larger the fiscal multipliers (as rigid wages tend to amplify the responsiveness of output to demand shocks). On the other, Dolls et al. (2012) report a negative correlation between fiscal multipliers and the size of automatic stabilizers.

A number of recent studies focus on Italian regions and/or macro areas, estimating ‘local fiscal multipliers’ on regional cross-sectional data using SVARs in a panel setting⁴. Deleidi et al. (2021) decompose public expenditures between current and investment spending, finding investment multipliers equal to 4 in Centre-North and 2.3 in Mezzogiorno. Their results are confirmed when accounting for fiscal foresight. Zezza and Guarascio (2023), on the other hand, focus on mission-oriented public expenditures (i.e., green, digital, and knowledge-related), and its effects on stimulating economic activity (private investment and GDP), and foster structural change (export competitiveness and high-tech manufacturing).

Other studies use instead Bayesian techniques to estimate region-specific multipliers. De Stefanis et al. (2022) focus on three sources of public spending – EU structural Funds, government investment and government consumption. They find positive multipliers for government investment (even though the larger values are reported for EU structural funds), with generally higher values for Mezzogiorno.⁵ While the previously discussed studies use an identification strategy based on a Choleski scheme,

problem makes the identification of shocks harder, inevitably influences the values of the estimated multipliers, and questions the robustness of results.

⁴ For model-based estimates see, among others, (Canelli et al., 2022; Piacentini et al., 2016).

⁵ As in Marrocu and Paci (2010) and Piacentini et al. (2016).

Lucidi (2022) uses theory-driven sign restrictions, as in Canova and Pappa (2007), estimating the effects of shocks to public current expenditure (i.e., the sum of public final consumption and social transfers), public investment and deficit, on GDP, employment and prices. His results point to a misalignment in fiscal multipliers not only between aggregates – with the highest multipliers reported for investment and the lowest for revenues – and across macro-areas – with Centre-North displaying an investment multiplier at impact of 2.5, against 1.5 in Mezzogiorno – but also within them.⁶

3. Data and methodology

3.1. Data and descriptive evidence

Our research builds on the concept of “social infrastructure”, which encompasses the provision of education, healthcare, social assistance, and childcare (Oyvat and Önarar, 2020). It is worth noting that a majority of social workers, both paid and unpaid, are women. Consequently, while investment in social infrastructure may not specifically target women, they have the potential to alleviate gender inequalities and enhance inclusiveness in the labor market by increasing both labour supply and labour demand (Ngai and Petrongolo, 2017; Azmat and Petrongolo, 2014; Huidrom et al., 2020; Akbulut, 2011).

To consider public expenditures in the social sector as “investment” or “infrastructure”, they should create a lasting stock of human and social “capital”, yielding long-term benefits to the public. However, the international System of National Accounts (SNA) classification fails to acknowledge the long-term contributions made by social infrastructure spending for the creation and accumulation of human and social capital. According to SNA, spending on social infrastructure, including the management and staffing of educational, healthcare, and childcare facilities are not considered

⁶ In Centre-North, the investment multiplier at impact ranges between 7.8 for Trentino and 1.3 for Tuscany.

investments. This means that government spending on salaries of teachers, nurses, and childcare workers fall under the government's annual current expenditure. This is one of the main reasons why fiscal consolidation policies often target spending on social infrastructure, neglecting the fact the benefits derived from today's investments in health, education, and childcare extend well into the future. A more educated, healthier, and cared-for population, along with a system that provides such aids, benefits society as a whole.

Figures for public spending in the social sector are available at the country level from Eurostat. At the territorial level (NUTS 2), however, while public consumption follows the COFOG 10-sector taxonomy, investment spending is all lumped into three sectors (education, healthcare, and other), so the matching between public consumption and investment for each economic sector is not possible. Moreover, it is not possible to distinguish between categories of expenditures, thus avoiding the possibility of excluding the most endogenous components of public spending (i.e., interest expenditures and automatic stabilizers).

As said previously, we rely on regional data from the CPT database, as in Zezza and Guarascio (2023). CPT data provide information on public spending broken down by category, economic sector, and institutional level. This rich dataset allows us to construct fiscal variables explicitly excluding all major sources of endogeneity found in the SVAR literature – i.e., automatic stabilizers – thus easing the identification of exogenous shocks. Following the previous discussion, our fiscal variable (G_i) is the sum of “wages and salaries paid”, “goods and services bought”, “current transfers to households and firms” and “investment in fixed capital” (i.e., machineries and infrastructure). Figure X shows the dynamics of spending in the social sector, highlighting the values for Centre-North and Mezzogiorno.⁷ Differently from the

⁷ Data inspection showed that the two alpine regions of Trentino Alto Adige and Valle d’Aosta display values for social infrastructure spending systematically higher than all other regions and are thus dropped from the empirical analysis. However, results are qualitatively identical.

dynamics of total public expenditures per capita, structurally higher in Centre-North, spending in the social sector is similar across regions (although still higher in the North), and equally declining following the GFC of 2008.

Figure X. Real public expenditures per capita in the Social Sector. Centre-north and Mezzogiorno. 2000-2020

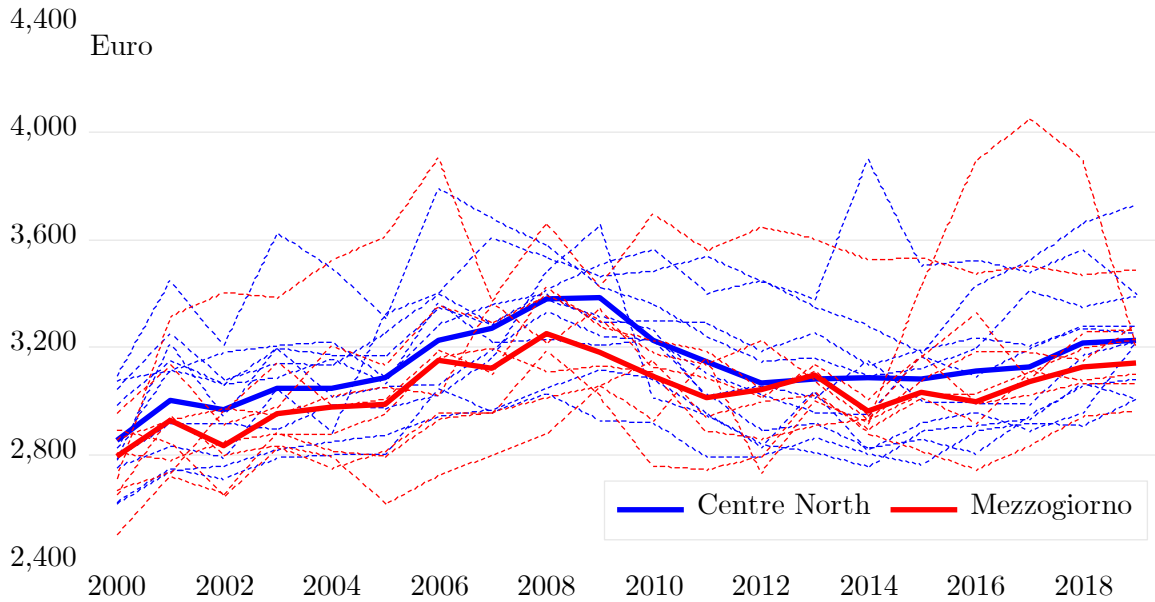
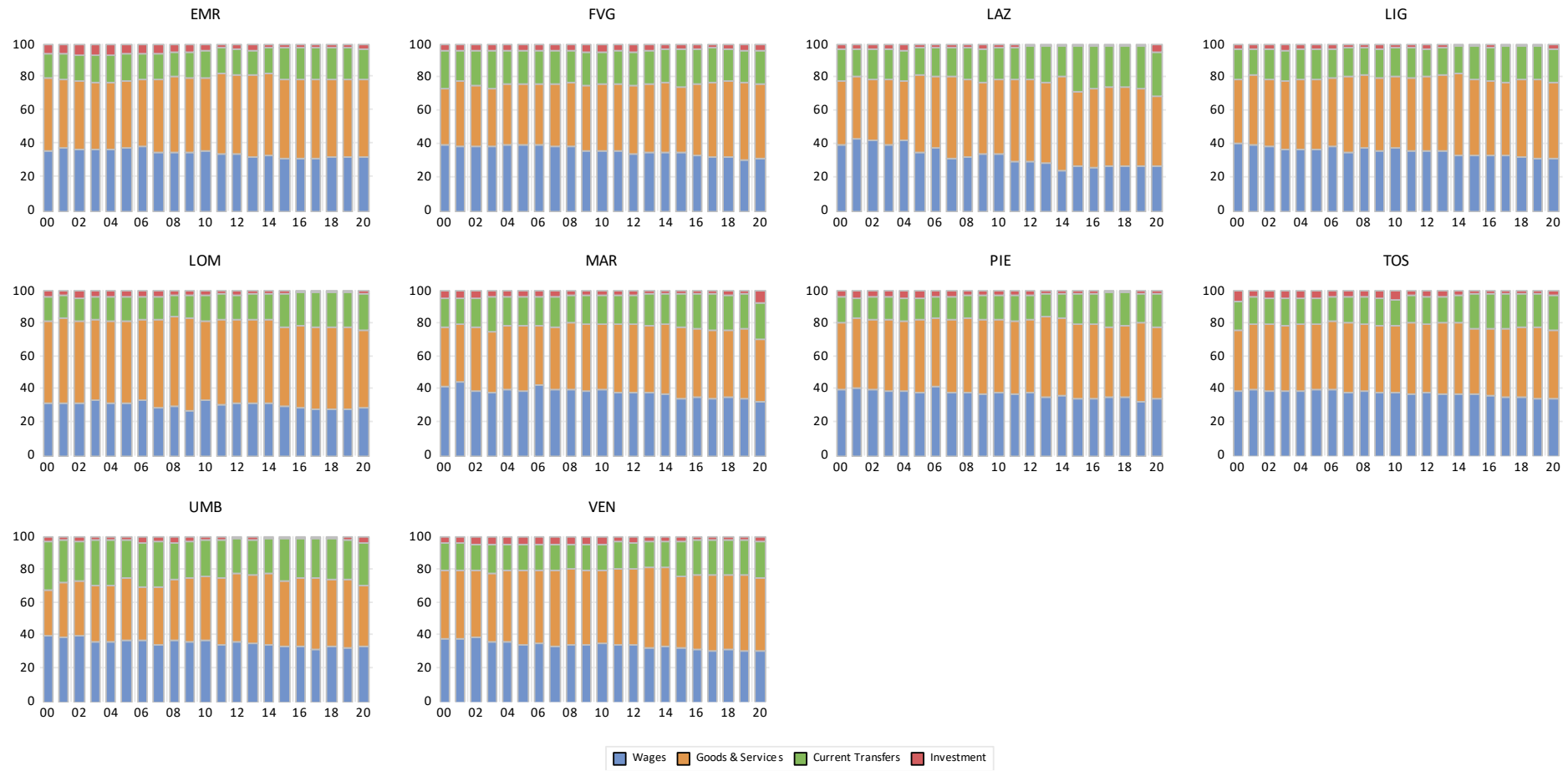
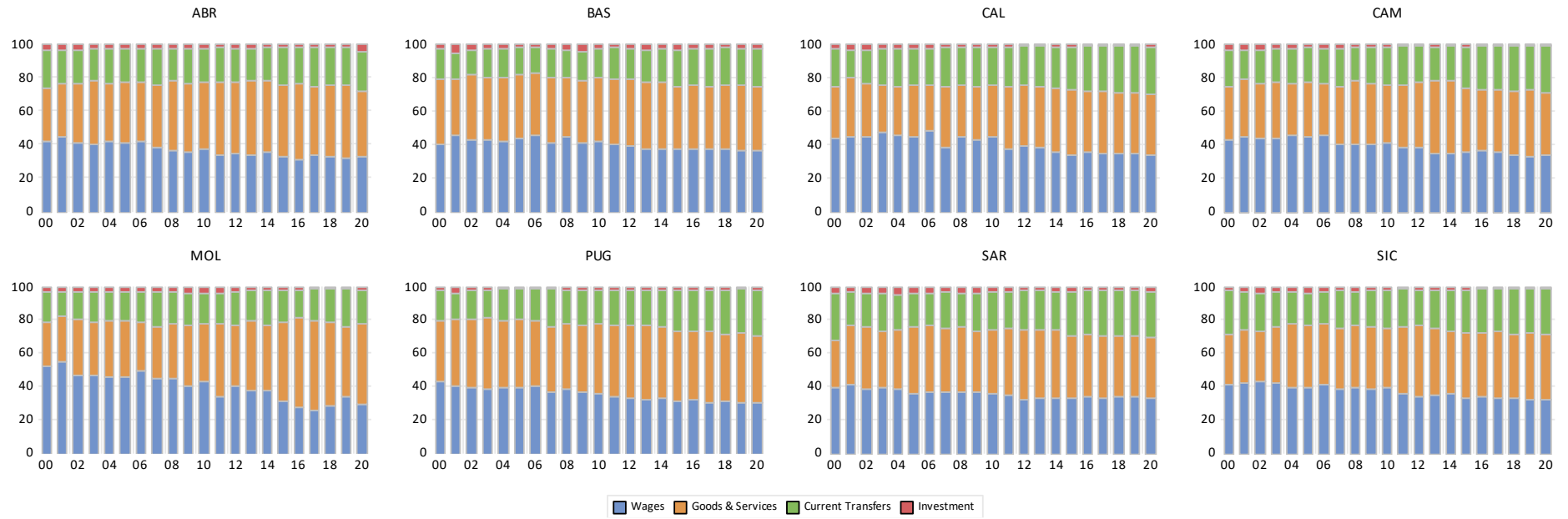


Figure X, in turn, shows the composition of regional social expenditures in the sample. The interesting fact here is that the major contraction in spending was in wages and investment, particularly in the South.

Public expenditures in the Social Sector. Components. Centre North



Public expenditures in the Social Sector. Components. Mezzogiorno



3.2. Methodology

Building upon the works by Akitoby et al. (2019) and Zezza and Guarascio (2023), we estimate a five-variable panel structural vector autoregressive (P-SVAR) model. This model incorporates regional fixed effects and examines the following variables: public expenditures in social infrastructure per capita (G_i), private investment per capita (I_i), Gross Domestic Product per capita (Y_i), total employment (E_i) and the female share in total employment (W_i).

P-SVAR modelling employs a four-step procedure: I) starting from a reduced-form P-VAR(n), II) a P-SVAR is estimated by imposing an identification strategy on the matrix of contemporaneous coefficients, III) impulse response functions (IRF) are then retrieved and, IV) the IRF are then transformed into euro-to-euro multipliers through the appropriate conversion factors.

We use a Choleski scheme, as in (1), to identify fiscal policy shocks.

$$B_{0i}y_{i,t} = \begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ - & 1 & 0 & 0 & 0 \\ - & - & 1 & 0 & 0 \\ - & - & - & 1 & 0 \\ - & - & - & - & 1 \end{pmatrix} \begin{bmatrix} g_{i,t} \\ i_{i,t} \\ y_{i,t} \\ e_{i,t} \\ w_{i,t} \end{bmatrix} \quad (1)$$

Where $B_{0i}y_{i,t}$ is the the matrix of contemporaneous coefficients, (-) denotes "free" parameters, and 0s indicate restrictions. The Choleski scheme is “a story about a given endogenous variable being determined by those *higher up* in the system but not those *lower down*” (Ouliaris et al., 2016, pp. 92–93), with the ordering of variables determined by economic theory.

As custom in fiscal research, government spending is ordered before other macroeconomic monetary variables (in our case, investment and GDP), as in the seminal paper by Blanchard and Perotti (2002). Private investment is ordered second – as in Deleidi and Mazzucato (2021) and Zezza and Guarascio (2023). The rationale here is that private firms (long-run) investment plans do not respond to

contemporaneous changes in fiscal spending, as they are based on (long-run) expectations about the state of the economy.

Labor market variables (E and W) enter the VAR after GDP, in a set-up is similar to the recent IMF study by Akitoby et al. (2019). Including the share of women in employment W allows us to ascertain the effects of fiscal shocks on the labor force *composition*. Indeed, one should expect that a shock to social infrastructure – a gender segregated sector – would induce a positive shift in W (i.e., reduce the gender employment gap).

Alternatively, we also estimate a model where the female labor market is included through the women’s labor force participation rate ($LFPR_i$). Thus, (1) becomes (2)

$$B_{0i}y_{i,t} = \begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ - & 1 & 0 & 0 & 0 \\ - & - & 1 & 0 & 0 \\ - & - & - & 1 & 0 \\ - & - & - & - & 1 \end{pmatrix} \begin{bmatrix} lfpr_{i,t} \\ g_{i,t} \\ i_{i,t} \\ y_{i,t} \\ e_{i,t} \end{bmatrix} \quad (2)$$

Where $LFPR_i$ is ordered first, as it represent a structural variable which can be thought to hardly change in response to contemporaneous shocks.

Finally, we also investigate possible heterogeneous effects of social spending across regions, by splitting the sample along: i) *territorial dimension*, distinguishing between Centre-North and Mezzogiorno; and ii) *the provision of early childcare services* (age 0-3), e.g., its territorial diffusion and the childcare enrolment rate.

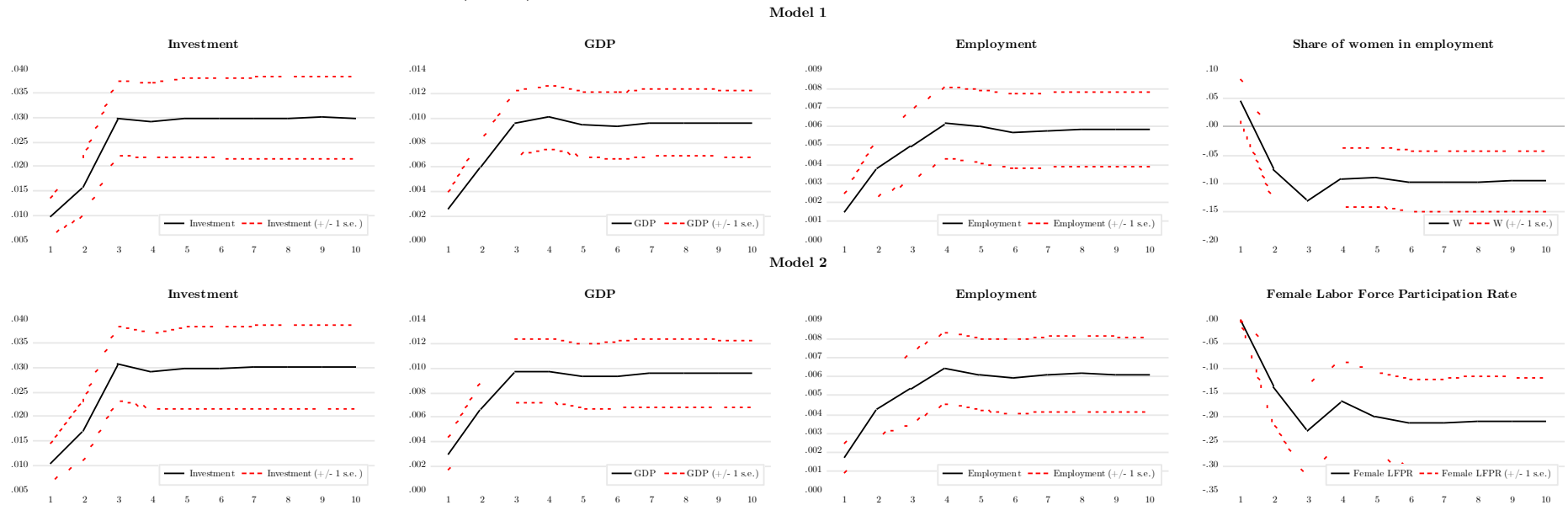
4. Results

Figure X shows the Impulse Response Functions (IRFs) from model 1 and 2 estimated on the whole sample – which display the dynamic response of the variables following a shock to fiscal spending –, while Figure X shows the corresponding Variance decomposition – which display the percentage of the forecast variance due to each

innovation at every horizon. Finally, Table 1 shows the cumulative multipliers relative to model 1 and 2, estimated on all regions, and when splitting the sample between Centre-North and the Mezzogiorno.

In both specifications, shocks to social infrastructure have positive effects on investment, GDP, and employment. However, the effect on female labor market are positive only at impact (in model 1), and reverse the sign thereafter, while the effect on female labor force participation rate is negative – and statistically significant – throughout.

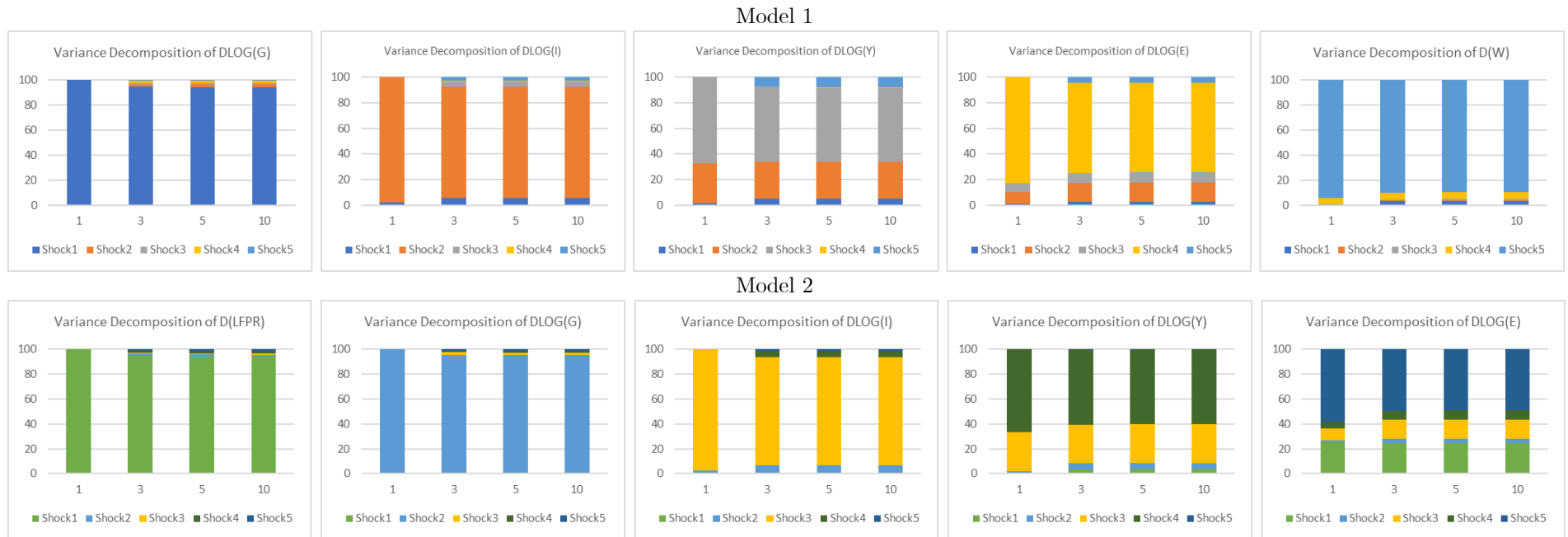
Figure X. Impulse response functions (IRFs) from models 1 and 2 elasticities for all regions.



Note: mean response = solid lines; confidence bands = dotted lines.

Source: Authors' own elaboration.

Figure X. Variance decomposition using structural vector autoregressive (SVAR) factors: models 1 and 2 for all regions.



Note: Shown is the percentage of the forecast variance due to each innovation at every horizon, with each column adding up to 100%.
 Source: Authors' own elaboration.

Table 1. Cumulative multipliers relative to a shock to social infrastructure

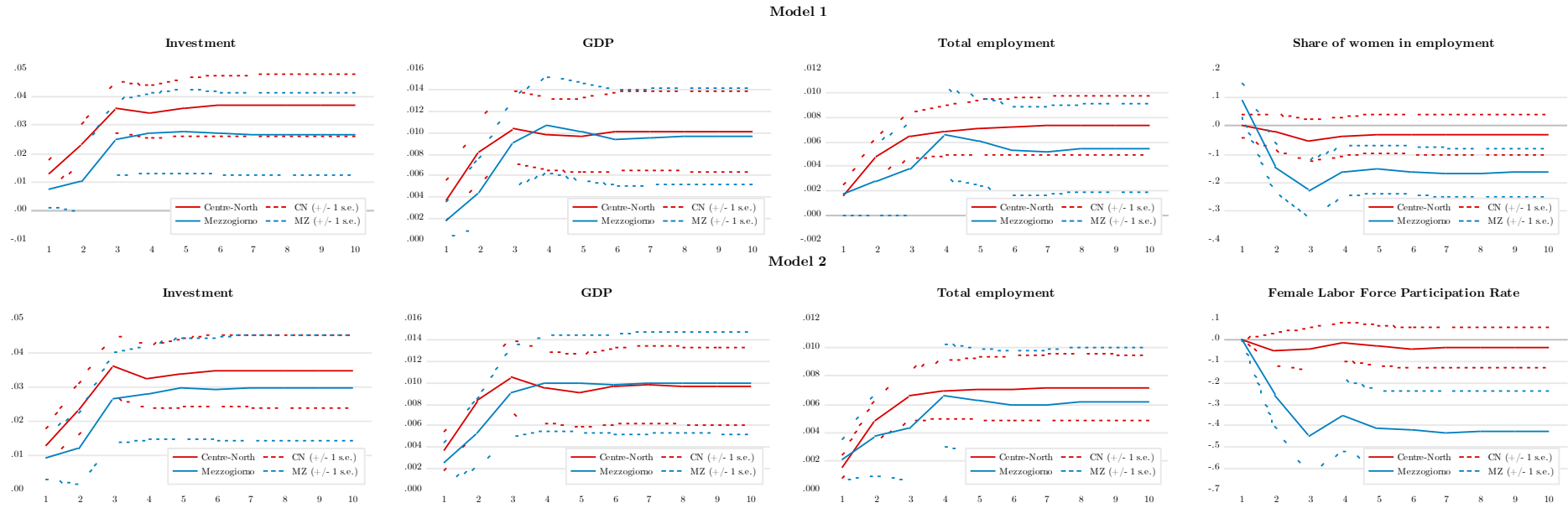
		Model 1					Model 2				
		1	2	3	4	5	1	2	3	4	5
All regions	I	0.4	0.8	1.3	1.3	1.3	0.4	0.9	1.3	1.3	1.3
	Y	0.5	1.6	2.1	2.2	2	0.6	1.8	2.1	2.1	2
	E	12.9	44.3	48.2	60.8	57.3	25.5	78.9	94.7	95.5	87.7
	W	1	-2.3	-3.3	-2.3	-2.2	0	-4.3	-5.8	-4.2	-4.8
Centre North	I	0.6	1.5	2	1.8	1.9	0.6	1.6	2	1.7	1.8
	Y	0.9	2.8	2.9	2.6	2.6	0.9	2.8	3	2.5	2.5
	E	19	77.7	87.9	87.7	91	43.6	135.8	143.6	123.3	119
	W	0	-0.7	-1.5	-1	-0.8	0	-1.6	-1.3	-0.2	-0.7
Mezzogiorno	I	0.2	0.4	0.8	0.9	0.9	0.3	0.4	0.8	0.9	0.9
	Y	0.2	0.8	1.3	1.7	1.5	0.3	0.9	1.3	1.5	1.4
	E	8.7	18.4	20.8	39.3	34.4	12.6	36	50.8	58.6	54.2
	W	1.8	-3.9	-5.1	-4	-3.5	0	-7.1	-10.1	-8.5	-9

Notes: the table reports the cumulative multipliers relative to a shock to per-capita Public Expenditures in social infrastructure. Multipliers for investment and GDP are expressed euro-on-euro. The response of employment is expressed in thousand units, and the response of the share of women in employment in percent change. Statistically significant values are reported in bold and highlighted in green (red) if positive (negative), with the highest (lowest) value in a darker shade.

While public spending on social infrastructure yields positive outcomes in terms of output growth and crowds in private investment in all areas of the country, the impact is more sizeable in Centre-North. This result, in line with the literature on Italian regional multipliers (Deleidi et al., 2021; Destefanis et al., 2022; Zezza and Guarascio, 2022), derives from: i) its greater industrial and infrastructural development; ii) the lower import dependency vis-à-vis Mezzogiorno; and iii) the better quality of public institutions. Unsurprisingly, these results are confirmed for regions characterized higher presence and quality of childcare services (Figure X).

Despite the favourable, albeit transitory, effect on the gender employment gap, the dysfunctional characteristics of the Italian labour market seem to prevail in the medium-to-long term. Indeed, the positive effect of social spending on female employment turns negative and statistically significant after 3 years. We argue that temporary or one-off measures are insufficient, and rather, structural, and farsighted policy actions are necessary to reverse trend of persistent gender divides.

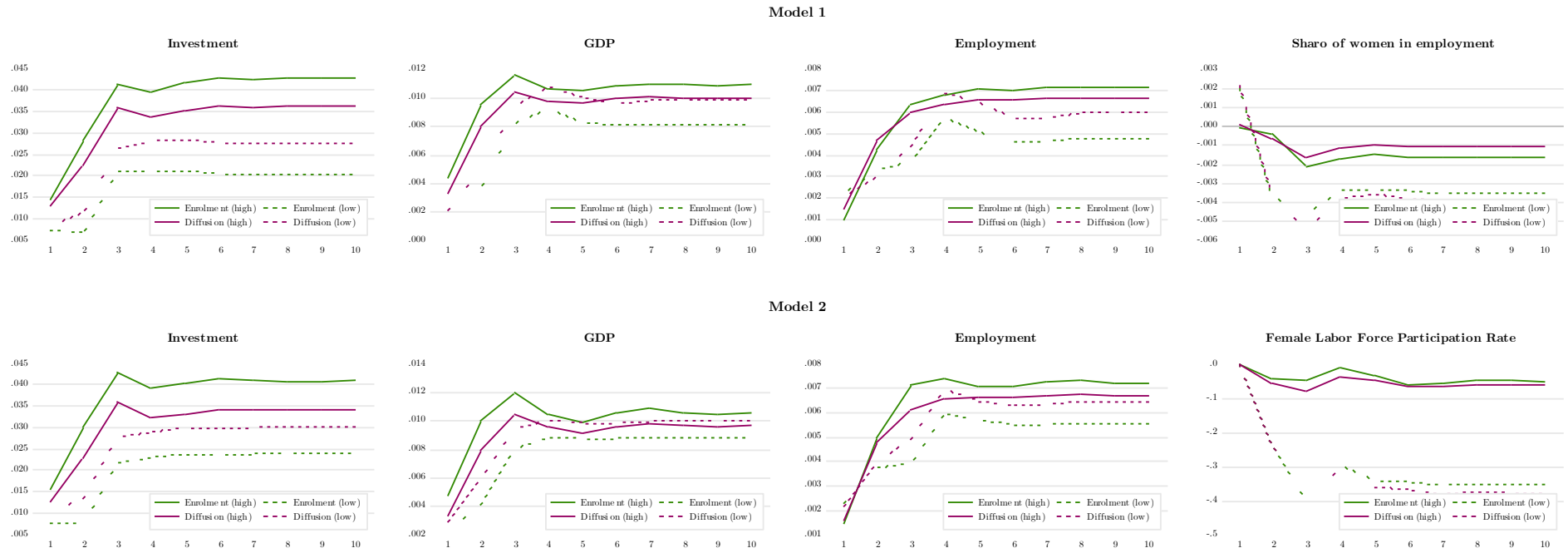
Figure X. Impulse response functions (IRFs) from models 1 and 2 for macro-areas: elasticities.



Note: mean response = solid lines; confidence bands = dotted lines.

Source: Authors' own elaboration.

Figure X. IRFs. Sample split according to (i) enrolment rate and (ii) territorial diffusion of childcare services



5. Conclusion

[...]

Finally, this work provides a conceptual framework that could be adapted to other countries characterised by marked territorial and gender disparities.

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