

More than a She-recession

Long-term feminization and short-term pandemic effects

Linnea Nelli

Università Cattolica del Sacro Cuore

Maria Enrica Virgillito

Scuola Superiore Sant'Anna

The Covid-19 crisis has been defined as a *She-recession* because of its disproportionate impact on female employment by contrast to past recessions defined as *Man-recessions*, for the usual disproportionate impact on men. The roots of the She-recession can be however traced back to the persistence of gender asymmetries both intra-household and extra-household in the labour market, a phenomenon known as feminization. This paper aims at measuring and explaining the gender differences in the impact of the Covid-19 crisis on the Italian labour market from a macroeconomic perspective. We measure the duration, depth, and diffusion of the Covid-19 crisis on job losses, structural unemployment, and inactivity. We find that the impact of the Covid-19 crisis has been more than proportional for women, especially for low-educated female workers and for those working in the South during 2020.

La crisi Covid-19 è stata definita come una She-recession a causa dell'impatto sproporzionato sull'occupazione femminile diversamente dalle recessioni passate definite come Men-recession, per l'usuale impatto sproporzionato sugli uomini. Le radici della She-recession possono essere identificate nella persistenza di asimmetrie di genere sia intra-familiari che extra-familiari nel mercato del lavoro, un fenomeno conosciuto come feminization (femminilizzazione). Questo articolo si pone l'obiettivo di misurare e spiegare le differenze di genere dell'impatto della crisi Covid-19 sul mercato del lavoro italiano da una prospettiva macroeconomica. Misuriamo la durata, la severità e la diffusione della crisi Covid-19 su perdite in occupazione, disoccupazione di lunga durata e inattività. Riscontriamo che durante il 2020, la crisi da Covid-19 ha avuto un impatto più che proporzionale sulle donne, specialmente sulle lavoratrici del Sud Italia e su quelle con livello di istruzione basso.

DOI: 10.53223/Sinappsi_2023-02-2

Citation

Nelli L., Virgillito M.E. (2023), More than a She-recession. Long-term feminization and short-term pandemic effects, *Sinappsi*, XIII, n.2, pp.25-60

Keywords

Covid-19
Female employment
Gender inequality

Parole chiave

Covid-19
Occupazione femminile
Disparità di genere

Introduction

During the pandemic crisis, a new concept has spurred into both academic and journalistic literature aimed at qualifying from a gender perspective the recessionary impact of the crisis on labour markets, namely, the notion of *She-recession*. The very concept of *She-recession* tries to account for the fact that a crisis

might have an asymmetric unfolding with respect to its gendered impacts and takes origin from the comparison between the Great Recession in the US, from 2007 to 2009, vis-à-vis the Covid-19 crisis in 2020. In fact, the literature defines the past economic downturns as *Man-recessions*, since the impact of pre-pandemic crises has usually been harder on male employment

rather than on female one. Until the pandemic crisis, economic shocks mainly affected male-prevalent industrial sectors, such as manufacturing and construction, subject to high cyclical volatility (Hoynes *et al.* 2012; Rubery and Rafferty 2013; Alon *et al.* 2021). Differently, the Covid-19 crisis has led to a major decline in female employment (Shibata 2020). The origin of the crisis, a global health crisis, and the adopted measures to contain it, in particular social distancing and lockdowns, have largely impacted service sectors, the latter involving working activities characterized by inter-personal contacts that cannot easily be performed from home. These sectors are characterized worldwide by predominantly female employment quotas. In addition to the closure of workplaces, school closures had a strong impact on motherhood, with female workers having to divide their time between working at home, whenever possible, and childcare, which typically weighs on women's shoulders. The interaction between the specificity of the pandemic crisis and the ensuing non-medical containment measures has resulted in what is now commonly understood as *She-recession*.

According to Del Boca *et al.* (2020), Italy is an interesting case study on this matter. On the one hand, it is the first European country where the coronavirus spread and where very strict lockdown measures were adopted, particularly long school closures. On the other hand, the Italian labour market is characterized by low female labour force participation and long-lasting gender asymmetries. Cetrulo *et al.* (2022) show that Italian women are mainly employed in essential, low-skilled sectors, service and retail activities, which could not be performed from home during lockdown phases; largely under temporary contracts or self-employed, many women were not covered by the firing restrictions applied by the Italian government as a response to the Covid-19 related economic crisis. Considering jointly gender asymmetries in the sectoral distribution of occupations and precarious working conditions, women

in the Italian labour market have been dramatically exposed to negative side effects of the pandemic, with peaks in unemployment and transition to inactivity at 98% during the last quarter of 2020¹. The roots of the She-recession can be however traced back to the persistence of gender asymmetries both intra-household and extra-household in the labour market, a phenomenon known as *feminization*². With extra-household feminization we intend feminization of the labour market which implies occupational segregation in low-paid activities, contractual segregation in temporary and fixed contracts, and fragmentation of jobs. Intra-household feminization implies a gendered division of unpaid and care work and gendered norms, the latter reflected in high inactivity and low female participation in the labour market.

In this contribution we ask the following research questions: has the She-recession taken place in Italy as a consequence of the Covid-19 shock? If yes, how can we measure the severity of such a phenomenon? To what extent the root causes of the She-recession are temporary or, alternatively, structural? We try to answer these questions by studying the unfolding over time of the She-recession in Italy. We take a macroeconomic-structuralist perspective, identifying its root causes in the persistent attributes of female employment conditions in the Italian labour market, both in the long and the short run. We first present a series of structural labour market trends in female employment. We then assess the She-recession looking at *depth, duration and diffusion* of the Covid-19 crisis, according to the NBER methodology of crisis identification, considering the long-term pre-crisis trends. In this respect, we build and refine the statistic developed by Fazzari and Needler (2021), a loss function measuring the unfolding of the crisis in terms of the three above-mentioned dimensions. The measure represents a proxy to detect the potential emergence of hysteresis in labour market patterns, being built upon deviation from long-term trends.

1 Total employment has decreased by 101,000 units in December 2020 compared to November 2020, of which 99,000 units of female employment (cyclical variation in Table 1), [Istat](#) (2020).

2 In the literature on poverty, the term *feminization* relates to the concept of feminization of poverty (Pearce 1978, as cited by Mc Lanahan *et al.* 1989) for which the exposure to poverty risk for women is higher than for men because of the change in family structures, occupational segregation on the labour market and welfare programs (Peterson 1987). While the implications for poverty risk are not addressed in our analysis, in this paper, we refer to feminization of the labour market. The concept intends that the increasing female participation rate in the labour market has been accompanied by the servitization and flexibilization of employment relations since the 1990s. In that, feminization implies occupational segregation and precariousness disproportionately affecting women (Manicardi 2023; Rubery 2015; Betti 2016; Cetrulo *et al.* 2023). Labour market feminization has been however also ignited by gender norms implying low participation rates and part-time working arrangements. In that, we uncover both extra-household and intra-household relations leading to feminization.

Using quarterly data from the Italian Labour Force Survey, we compute loss functions in employment, structural unemployment and inactivity distinguishing by gender, education level, geographical location and sectoral distribution. The measure allows us to retrieve equal vs unequal outcomes in the distribution of losses among categories for each series of interest. We document a disproportionate impact on female employment and a proportional effect on female inactivity due to previous hysteresis in the labour market. Women from the South and women with lower education levels have been the most exposed categories, recording an impact more than proportional compared to higher-educated women and women from other regions.

The analysis is structured as follows: Section 1 accounts for a theoretical discussion and previous findings on She-recession; Section 2 looks at structural trends and changes in female labour markets, focusing on the role of education, tertiarization, flexibilization of the labour market, and regional asymmetries, in a nutshell, patterns of feminization of labour markets (Manicardi 2023). Section 3 presents the data, Section 4 links structural trends and pandemic effects in female labour markets to detect the She-recession and present the methodology and the results. Our conclusions are laid out in the last Section.

1. She-recession: why the pandemic crisis is different

Female labour demand and supply during recessionary periods

In order to understand the specific attributes of the She-recession we need to compare such an event with previous episodes of crises. Recessions are generally understood as originating from supply or alternatively demand 'shocks'. Generally speaking, with respect to supply shock crises, the literature refers to energy crises or imported-inflation of intermediate goods that propagate via price-channels, with the oil crisis in the seventies being the textbook case. When coming to demand crises, less acknowledged till the Great Recession in 2008, the literature refers to declines in wage growth and lack of consumption. The pandemic crisis has been classified as both a supply crisis, due to the reduction of working hours and labour supply, and a demand crisis, as far as wage compression and income losses might have constrained demand.

Crises, particularly in labour markets, propagate via industry channels: working hours reduction and

employment losses derive from output contraction in industries and sectors more exposed to the shocks. Therefore, both industry composition in terms of gender, and country composition in terms of industry, determine the severity of each given crisis and any eventual disproportionate effect on specific labour market/industry segments. Comparing the pandemic with 'ordinary' shocks provides evidence of asymmetric effects in terms of gendered job losses.

Hoynes *et al.* (2012) compare the financial crisis of 2007 with the economic recession in the 1980s in the United States. The loss in overall employment has been stronger and longer during the Great Recession than in the 1980s recession, mainly because of a higher participation of women to the labour market, but men accounted for the highest share of job loss, and they find that unemployment was more cyclical for men than for women both during the 80s and during the financial crisis. Rubery and Rafferty (2013) trace back gender differences in crisis outcomes to job segregation, work flexibility and participation, and welfare state capacity. The latter are channels through which there could be propagation of negative shocks leading to unexpected outcomes. Occupational segregation can both protect or expose more women according to the characteristics of the recession and, because of the low pay they receive, they might record an increase in employment during recoveries, acting as a substitute for higher-paid male workers; in addition, female labour supply is hugely dependent on the household role and welfare state benefits in kind. These attributes make the female component of labour markets behave in a very peculiar way compared to the male component. In line with this expectation, although highly shock-exposed industries have usually been male-dominated ones, looking at cyclical volatility between the last quarter of 2019 and the second one of 2020, female-predominant industries have recorded the highest loss in employment (Alon *et al.* 2021).

Therefore, the very nature of the recession in itself is the primary reason for the gendered effects of crises. However, in addition to asymmetric exposure to shocks because of occupational segregation, resulting from asymmetric labour demand patterns, female labour supply patterns are also quite specific.

Women responses to recessions might be very diverse. During ordinary shocks, a countercyclical response of female employment to counterbalance the risk of unemployment of the male partner has been

defined by Lundberg (1985) as the “added-worker effect” acting as an insurance against employment uncertainty, credit constraints and loss in earnings of the male members of the household. Rubery and Rafferty (2013) argue that in past recessions before the Great Recession in 2007, cyclical volatility of female employment was found only in manufacturing, where women mainly occupied buffer positions, with flexible hour arrangements to adjust to variations in demand and protect the male positions at the core, while in other sectors they were more protected. Flexible participation to the labour market instead has led to an increase in unemployment and a decrease in inactivity rate for women between 2007 and 2011. The evidence of the added worker effect varies across countries. Bredtmann *et al.* (2018) analyse the responsiveness of female labour supply as a consequence of male partners’ unemployment status across different welfare regimes. They find that only Mediterranean countries (Italy, Spain, Portugal and Greece) show an added worker effect both on the extensive and intensive margin, because of low social protection and dominance of the familistic culture. Similarly, Prieto-Rodriguez and Rodriguez-Gutierrez (2003) find the added worker effect to be present in the years 1994, 1995 and 1996 only in Italy as opposed to other countries in their sample, where female labour supply is less related to the employment status of their husbands. Muñoz *et al.* (2015) found the presence of the added worker effect during the Great Recession in Italian and Spanish households. According to the Authors, the added worker effect is more significant for women while labour supply decreases for mothers and Italian women when income in the household increases. Ghignoni and Verashchagina (2016) found evidence for the added worker effect in Italy during the Great Recession, with the probability of participating to the labour market being 4.9% higher for women whose husbands became unemployed during 2010-2012. Childcare weakens the added worker effect, while mortgages positively affect the increase of female participation early in the crisis (2006-2008). However, employment translates mainly into low pay and precarious jobs. Franceschi (2014) estimates the added worker effect in Italy to be 2.4% and 4.2% for employment and participation respectively in 2009-2013 and that the added worker effect accounts for 8% of the increase in female employment in 2012 and 2013. The effect is lower for mothers while there is no evidence of ‘male added worker effect’ as a conse-

quence of job loss for women in the household. Baldini *et al.* (2018) analyse the reaction of household members to an employment shock, confirming the results of Franceschi (2014) and specify that for households in the South during the recession labour supply was intensified.

Remarkably, the Covid-19 crisis did not show these regularities. Because of the magnitude of employment decline during the pandemic (much higher than during the Great Recession, Shibata 2020), the “discouraged worker effect” (Lundberg 1985) characterized both female and male employment dynamics. Indeed, according to Albanesi and Kim (2021a), in the US employment decreases by 8.5% for married men with children compared to 13% for married women with children during the Covid-19 crisis. While the impact on male employment is higher than in the Great Recession (-2.4% versus -8.5%), the relationship is reversed for women (-13% in the pandemic crisis versus +0.2% during the Great Recession). According to Kim *et al.* (2022), less educated women, non-married and non-married with children are the ‘she’ of the She-recession, while the ‘he’ are never married and low-educated men.

Overall, the impact of the Covid-19 crisis on female employment has been twofold. On the demand side, acting via the *industry composition channel*, social distance measures have impacted female workers more than male ones due to the gender composition of the industries more subject to closures. On the supply side, acting via the *childcare channel*, school closures and gender norms in child and elder care forced working women to reduce their supply of labour also in sectors less hit by the pandemic, with the possibility of remote working, or even to exit the labour market.

She-recessions across countries

The extant literature shows that there is a large cross-country variation in the impact of the Covid-19 crisis on female employment. Alon *et al.* (2021) find that (i) gender gaps in employment effects decrease when controlling for occupations, but gender gaps for parents with school-age children are the largest in the United States and in Canada; (ii) the effect on employment is small in Germany and in the Netherlands but high on working hours, particularly because of furloughs schemes preserving employment but reducing working hours especially for women; (iii) the relative worked hour index for Swedish workers, that is the ratio between worked hours by women and worked hours

by men between the last quarter of 2019 and the second quarter of 2020, has increased given that Sweden has adopted softened school closures; (iv) in Spain the industry channel has a decisive impact since the results show a significant decline in hours for women with school-age children when controlling for occupation types, while it was not significant in the regression with no industry channel effects.

Hupkau and Petrongolo (2020) find that the effect of the Covid-19 crisis has been mixed in the United Kingdom: on the one hand, the gender gap has narrowed since the impact of the recession has been equally distributed among men and women in terms of job losses and resort to furloughs, while on the intensive margin, the reduction in worked hours and in earnings have been even smaller for women and an increase in fathers devoting time to housework and childcare is observed; on the other hand, women have taken care of 60% of the additional childcare hence gender differences in family life have widened. By the same token, for Italy Del Boca *et al.* (2020) and Del Boca *et al.* (2021) find that the time devoted by women to childcare is always higher except for those women who kept working where they used to during the pandemic. At the same time, they find that women's working arrangement does not affect the time their male partners devote to childcare or housework, but males' working arrangement does on their female partners. Biroli *et al.* (2021) ran a similar analysis comparing Italy, the United Kingdom and the United States while Djankov *et al.* (2020) found that the gender gap in labour force participation shrunk in Denmark, Norway, Australia and the United Kingdom thanks to ad hoc policies.

Particularly for Italy, the distribution of occupations by gender together with the housework division of labour are the main channels for which the impact of the pandemic has been so harsh for women. Cetrulo *et al.* (2022) show that women are mainly employed in essential, low-skilled sectors, such as service and retail activities, largely non-teleworkable occupations, with temporary contracts, or self-employed. The pandemic has exerted two consequences on these workers: firstly, they were not covered by the firings' restrictions, thus they were the category of workers for which the highest job losses were recorded; secondly, the impact of the lockdown measures on these sectors has exacerbated the polarization in wages between precarious and protected workers, widening gender gaps. Indeed, only 30% of professions can be executed from home

and women represent a low share of them (mainly employed in the administrative sector).

2. Beyond recessions: Long-term patterns of feminization of labour markets

The supply-side responses of women to the Covid-19 crisis acknowledged by the literature are particularly driven by gendered norms. Fabrizio *et al.* (2021) find that women without children whose occupations implied inter-personal contact have recovered in terms of employment much faster than mothers having similar occupations. Other than gender association for women in their role as mothers, the gender gap in earnings justifies the choice to reduce working hours for women who usually earn a lower salary than their male partners (Kleven *et al.* 2019; Albanesi and Kim 2021a; Albanesi and Kim 2021b; Hupkau and Petrongolo 2020; Sun and Russell 2021). However, the root causes of such patterns have to be traced back to long-term sources of occupational segregation.

The combination of structural changes in job opportunities in new growing sectors and higher levels of education have constituted a turning point for female employment. During the seventies, new job opportunities for women were constituted by the access to previously typical male professions such as teachers and bank clerks, by the increase in demand for health and childcare, a sector that already was female-dominated, and by technological change particularly in clerical work and telecommunications (Blau *et al.* 1998). Technological change, mainly computerization and the telecommunications revolution in the 1970s induced a recomposition effect in tasks and functions executed in the workplace, partly covered by female administrative jobs, growing also as a consequence of an increase in firm size and the need for clerical work (Costa 2000). Newly demanded job tasks matched women's abilities, thanks to an increase in their access to education (Goldin 1984; Dolado *et al.* 2002). The increase in women accessing higher levels of education was a result of what Goldin (2006) defines the *quiet and revolutionary phase of the modern economic role of women*. Starting in the late seventies, women's self-identity and decision-making began to shift from gender association, for which women identified themselves as housewives not participating to the labour market or not investing in their education, to their own individuality, involving a stronger attitude towards economic decisions, participation to the labour market and investments in human

capital and career development in a long-run horizon.

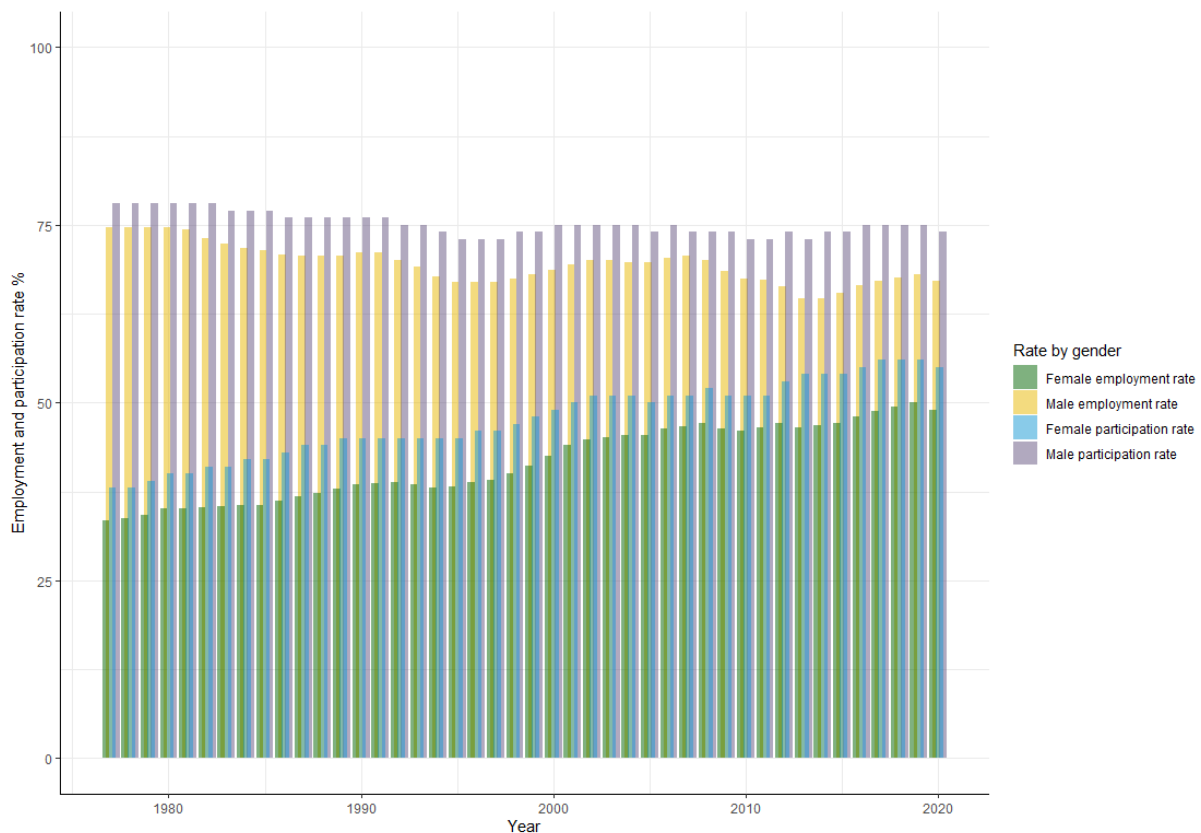
In the 1990s, the tertiarization of the economy drove female employment, providing for new job opportunities in services. Patterns in Italy followed such a trend. In Figure 1, both participation and employment rates are characterized by a positive and increasing trend for women, starting from levels below 40% for both rates in 1977 and reaching 50% - 55% in 2020. Nonetheless, both rates are still low compared to EU-level averages³, and especially lower than male participation and employment rates.

Despite the increasing trend in female employment, gender norms keep affecting the decision to participate to the labour market, the level and duration of education and consequently, the final occupation and sector of belonging for women, leading both to the concentration of female employment in low value-added sectors and/or limited access to high professional status (*horizontal and vertical occupational segregation*). Employment discontinuity in particular is among the sources of

segregation (Goldin 1984). According to Goldin (1984) women, as mothers and wives, exiting and entering again later the labour market do not become doctors or executives but nurses and typers (Goldin 1984, 2).

Although the increase in female education has narrowed the gap with male education level (Altonji and Blank 1999), there is wide agreement in the literature about the fact that the improvement in females' job experience given by non-intermittent careers, tenure and training accounts more than education in narrowing differences in earnings (O'Neill and Polachek 1993; Wellington 1993; Blau and Kahn 1997; Goldin 2006). Interacting with discontinuity in employment and education choices, Mincer and Polachek (1974) argue that there is a positive relationship between the continuity in participation, mainly observed in single, young women without children, and the initial investment in human capital in the first working experience, more than in later ones, while because of discontinuity of participation both wom-

Figure 1. Employment and participation rates by gender between 1977 and 2020 in Italy, age 15-64



Source: Authors' elaboration; data source: Labour Force Survey, ISTAT

3 Figure B1 in the Appendix.

en, usually married with children, and employees do not invest in learning and training skills.

Employers discontinuity and discriminatory hiring have long-lasting root causes. Historically, in Italy between 1951 and 1971 the female participation rate decreased with the shift from land to factory work (Costa 2000). In that period exclusively young, non-married women and with no children were employed in factories, mainly with part-time contracts and non-regulated dismissals. At the same time, care work and “industrial homework” were performed by up to 1 million women, in particular those migrating from the South to the North of Italy, in precarious work conditions in the informal economy. Such a pattern was observed during the 1970s as well, as a consequence of the feminization of industrial homework and exacerbated in the 1980s due to the flexibilization of the labour market (Betti 2016).

Employers’ perception of *motherhood* as a source of potential absenteeism from work, lower commitment and lower productivity affects female employment status in the hiring process. Acker (1990) claims that organizations are gender-structured, according to which a job, a set of tasks, competencies and responsibilities in the organization’s hierarchy, need to be filled by a worker with no other responsibilities outside the ones defined within the job’s boundaries. Therefore, a woman can’t fit the ‘*abstract job*’ since women have obligations in their household life other than those required by the job, while men do not. Cultural perspectives driven by gender norms and statistical discrimination (employers who rely on group averages based on stereotypes about candidates’ human capital which can’t be standardized from a job application, Birkelund *et al.* 2022; Gonzalez *et al.* 2019) are identified by the literature as the main drivers of gender discrimination by employers in hiring. Stereotypes can be descriptive, for which men are more committed to work and have leadership qualities, while women are caregivers. Descriptive stereotypes generate prescriptive ones which establish women’s role as ‘good mothers’ and men as ‘ideal workers’ for which women are expected to be less committed to work, more absent and thus less productive, fueling occupational segregation into male and female-dominated sectors (Gonzalez *et al.* 2019).

The above-mentioned channels, namely, employment discontinuity and intermittent careers, hiring discrimination because of motherhood, and job-title discrimination because of different ‘innate’ abilities between men and women, are all factors behind what we term the long-term feminization of the labour market. In the next paragraphs, we outline trends in Italian female employment with respect to education, sectors, contracts and geographical distribution, to provide some supportive statistical evidence of such long-term trend⁴.

Figure 2 shows female participation and employment rates by level of education between 1977 and 2020 in Italy: the higher the level of education, the higher the participation rate. Figure 3 presents the shares by education level within female employment. The improvement in education is straightforward: in 1977, only 4.4% of employed women had a tertiary education level while in 2020 the share was 31.2%; the share of working women with an upper secondary level of education follows a similar trend and in 2020 accounts for the highest share of employed women (46.2%). In 1977, the primary education level accounted for the category with the highest share in employment, while the share of working women with lower secondary education levels is quite stable over time.

Figure 4 provides for employment shares by gender in macro-sectors, namely agriculture, industry, and services in 1977 and in 2020⁵. Female employment is one-third of the male one in agriculture in 2020, a stable one-fourth share in industry, one-third in services in 1977 and almost equal to male employment in 2020. Indeed, with the tertiarization of the economy, women were employed mainly in administration services and public sectors (Betti 2016). We then look at the percentages of employment by gender in the different service activities, being the latter a female-dominated macro-sector. From Figure 5, adopting a NACE Rev.2 classification, “Education and health” is the sector with the highest share in female employment (72% vs. 28% of male employment both in 2008 and in 2020) and “Other service activities” (68% vs. 32% for male employment in 2020). “Accommodation and food” and “Administrative and support to firms” shares are quite balanced, while for “Information and communication”

4 The initial time and age differ in the discussed trends because of data availability for each category. 2020 is always the last period since we analyze the effect of the Covid-19 crisis during its first year. Employment by sectors and professional status are all age 15 and over to harmonize with the availability of data.

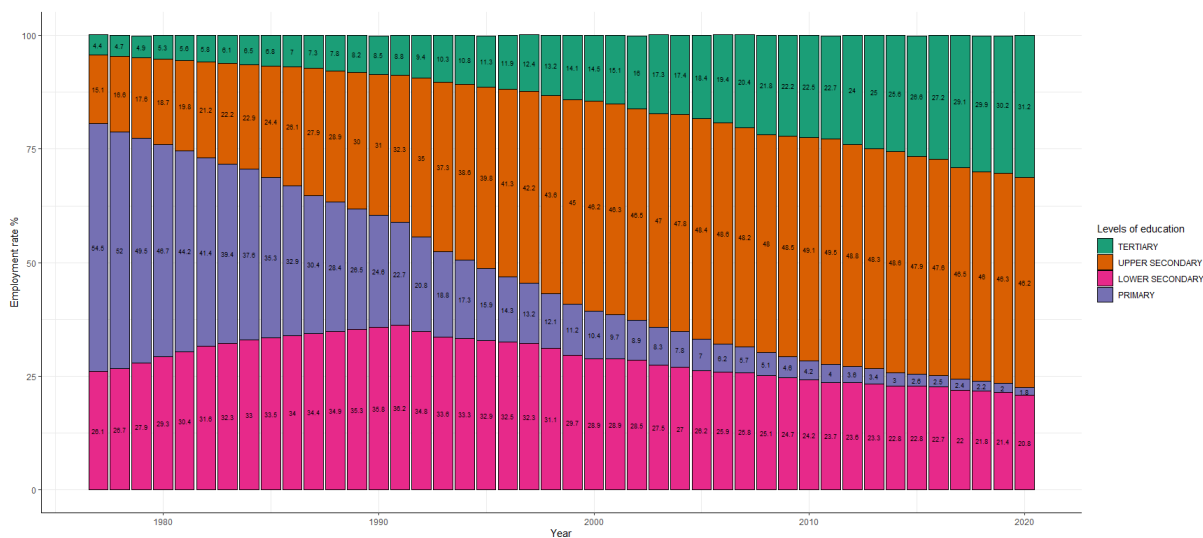
5 The NACE specification is the corresponding English translation of the sectors classified under the service macro-sector by ISTAT.

Figure 2. Shares of female participation rate by education from 1977 to 2020, age 15-64



Source: Authors' elaboration; data source: Labour Force Survey, ISTAT

Figure 3. Female employment rate by education from 1977 to 2020, age 15-64



Source: Authors' elaboration; data source: Labour Force Survey, ISTAT

and “Transportation and storage” male employment is much higher. This evidence accounts for the pattern of horizontal female occupational segregation, largely concentrated in so-called low value-added activities. Looking at occupational distribution by professional categories, a proxy for vertical segregation, Figure 6 shows that only 33% of executives are women in 2020, 45% middle managers and 31% are self-employed, while they account for 57% of white collars. Shares in professionals, middle management and

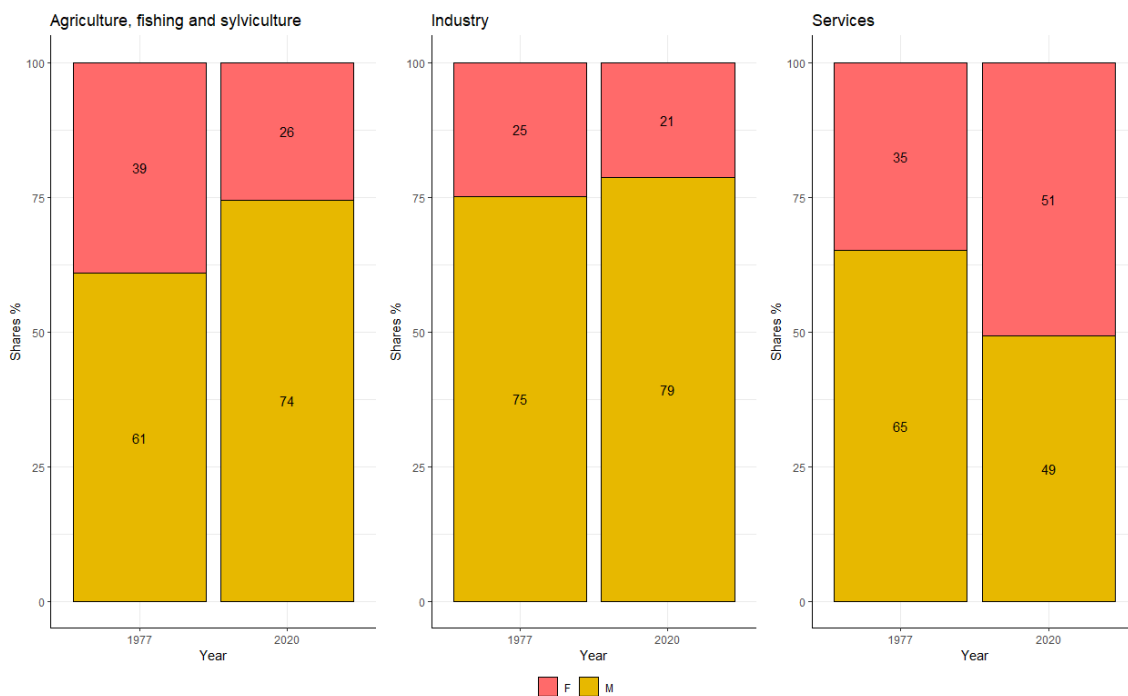
executives increased between 2004 and 2020. However, the bulk of female jobs being concentrated in “Other services” and in “Education and Health” are less subject to vertical mobility. In fact, among sectors, equally defined occupations are not equally remunerated, and horizontal segregation is not neutral thus exacerbates vertical disparities. Typically, in low value-added sectors, where female employment is concentrated, the possibility of professional upgrading and vertical mobility is lower than in so-called

high value-added sectors. Therefore, any potential amelioration in vertical mobility has to be compared with stagnant horizontal segregation.

Figure 7 shows that women account for the low-

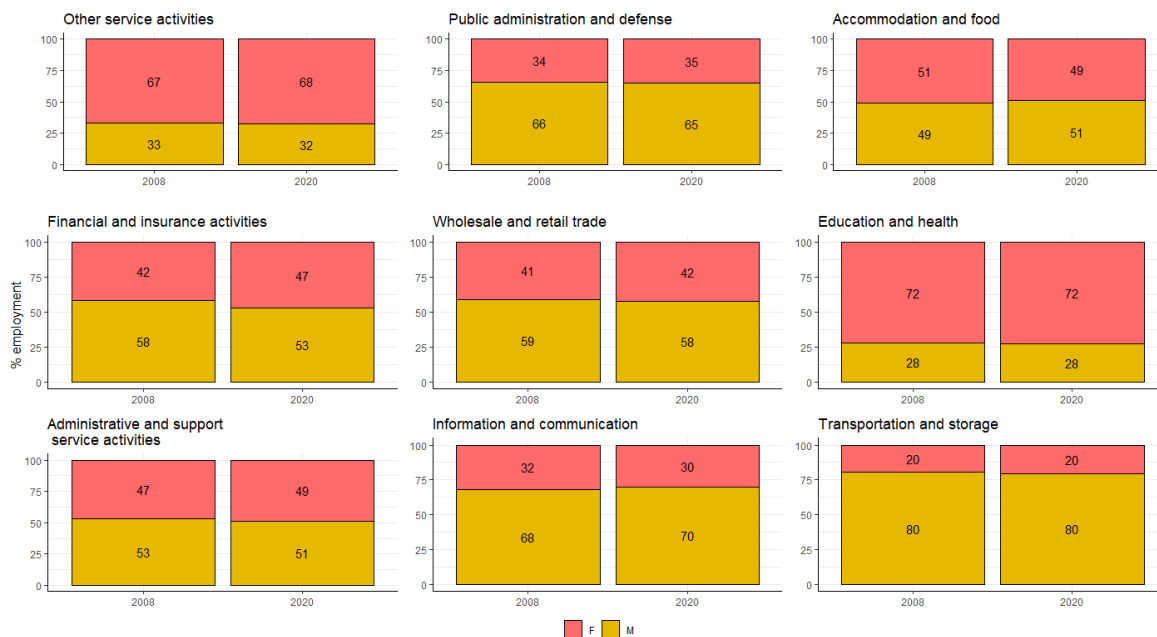
est share in full-time and open-ended contracts both in 2004 and in 2020. The flexibilization of work since the 1990s has become a feminized pattern, especially in Italy where both low and high-skilled wom-

Figure 4. Percentage share in employment by gender in macro-sectors in 1977 and in 2020 in Italy, age 15 and over



Source: Authors' elaboration; data source: Labour Force Survey, ISTAT

Figure 5. Percentage share in employment by gender in the service sectors in Italy in 2008 and 2020, age 15 and over

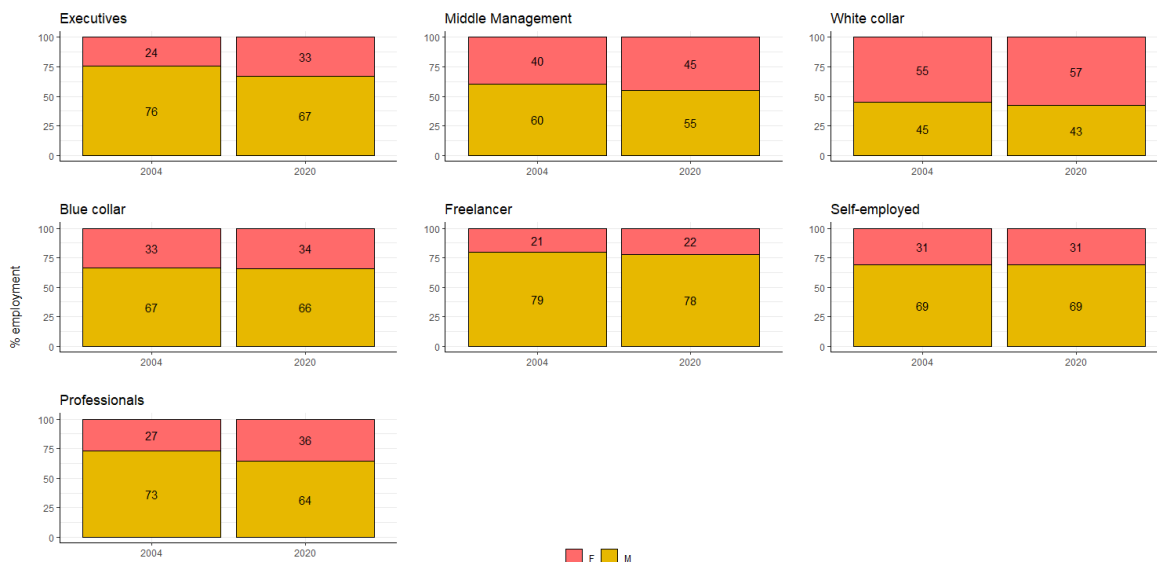


Source: Authors' elaboration; data source: Labour Force Survey, ISTAT

en are employed in occupations mainly by atypical contracts (Betti 2016; Manicardi 2023). According to Petrongolo (2004), the high shares of part-time contracts for women in Southern Europe is due to the gender discrimination affecting such countries rath-

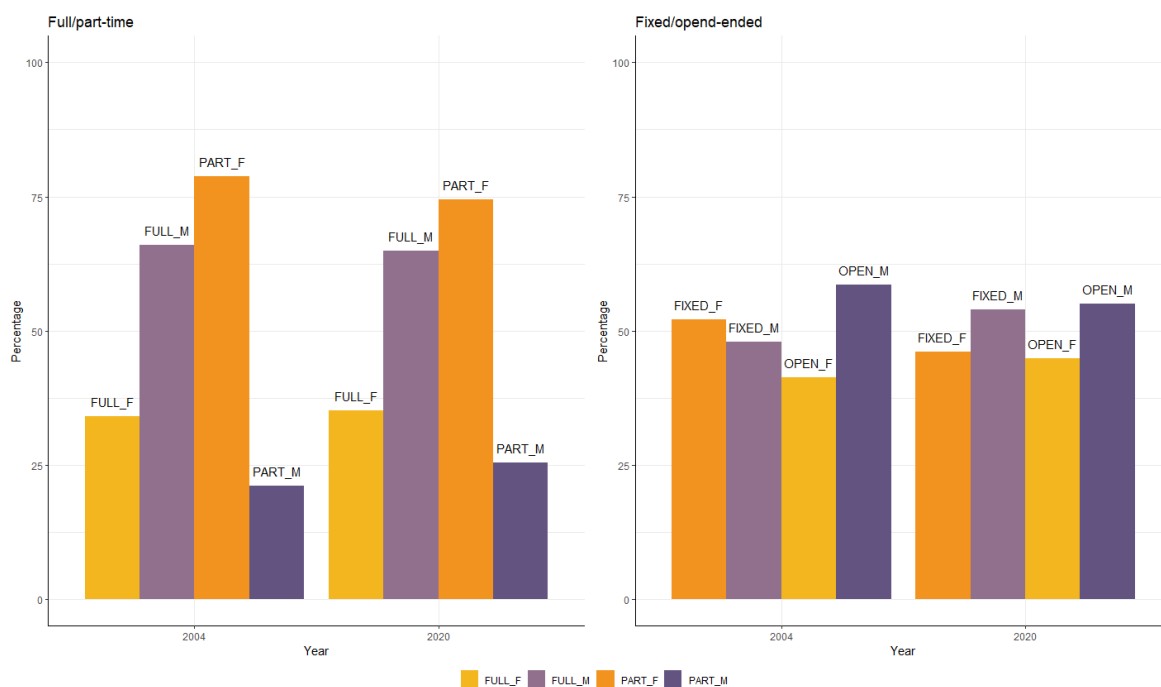
er than to womens' voluntary choices as in Northern countries, given that sectors as hospitality, cleaning, education, care, personal and social services happen to be both characterized by part-time/temporary working arrangements and female dominated

Figure 6. Percentage shares in employment by gender and by professional status in 2004 and in 2020, age 15 and over



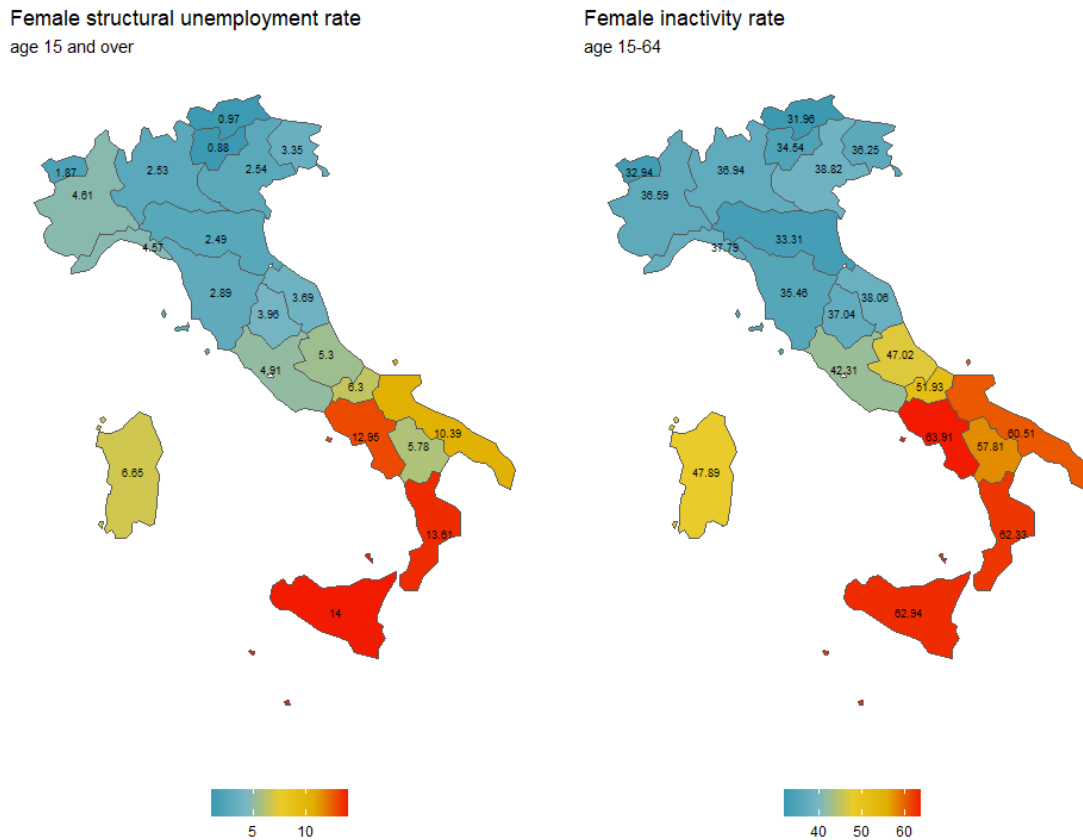
Source: Authors' elaboration; data source: Labour Force Survey, ISTAT

Figure 7. Percentage shares of full/part-time and fixed/open-ended contracts in employment by gender in 2004 and 2020, age 15-64



Source: Authors' elaboration; data source: Labour Force Survey, ISTAT

Figure 8. Female structural unemployment and inactivity rate by regions in Italy in 2020



Source: Authors' elaboration; data source: Labour Force Survey, ISTAT

sectors in which women are considered as 'more appropriate' (Buckingham *et al.* 2021; Birkelund *et al.* 2022).

Italy is characterized by a persistent asymmetry between Northern and Southern regions in gender labour market outcomes. Among the many territorial divides, gender divides are quite striking. Figure 8 reports the female structural unemployment rate (unemployed status for more than 12 months)⁶ and the inactivity rate by region. Structural unemployment is more than double for women in the South compared to more virtuous regions in the Centre and in the North of Italy. The inactivity rate is even more alarming suggesting strong discouragement effects in female labour market participation in half of the country. Notably, the South is also character-

ized by strong familistic orientations of the division of labour, with individuals pursuing the traditional division of labour following the male bread-winner model, with gender norms, at the very least, discouraging female participation in formal labour markets and women emancipation from family ties. In addition, from the demand side of the labour market, the structural weakness of the Southern productive structure hampers employment opportunities, and particularly good ones.

The documented patterns highlight the process of feminization of the labour market since the 1970s. In summary, such process can be expressed by the following trends: (i) female occupational segregation in low value-added sectors, (ii) unmatched increases of educational attainments with profes-

⁶ We look at structural unemployment as a variable characterized by strong hysteresis since the focus of the paper is on the long-term patterns of feminization of the labour market. We identify hysteresis as one of the main roots of the Covid-19 crisis, which developed as a She-recession and looks at structural rather than cyclical unemployment. The Labour Force Survey distinguishes for the duration of unemployment shorter or longer than 12 months. Further details are provided in Subsection From long-term feminization to hysteresis. The age cohort differs from inactivity because of data availability.

sional upgrading and in general wage remuneration for female workers, (iii) female disproportionate exposure to unstable and flexible contractual regulations, (iv) persistence of gender norms reproducing intra-household asymmetric division of labour and extra-household labour market participation.

3. Data

Having documented such long-term patterns, we now intend to focus on the specific effects on female workers due to the pandemic unfolding. In particular, we are interested in capturing hysteresis effects due to long-run trends in feminization as potential amplifiers of the pandemic crisis.

In order to accomplish the task, we analyze quarterly data from the Labour Force Survey of the Italian National Institute of Statistics (ISTAT) of employment, structural unemployment, inactivity for women and men aged 15 and over⁷, accounting for a long-term period, from 1993 to 2020 and of female employment by macro-regions (North, Centre and South, islands included), by level of education (tertiary, upper secondary, lower secondary and primary) for women aged 15 and over from 2000 to 2020 and by sectoral distribution (macro-sectors and focus on 9 service sub-sectors, NACE-1 digit) for women aged 15 and over from 2008 to 2020. Sectoral data are seasonally adjusted. Tables C1, C2, C3, C4 and C5 in the Appendix show the main descriptive statistics about these key variables. t is the number of observations, namely the number of quarters of the time series that changes because of data availability. Over the time period under consideration, on average female employment is lower than male employment by 4,572,650 units, female structural unemployment is higher than male one by 2,000 units while female inactivity is higher by more than 6 million units. Looking at the mean values of female employment by region, employment in the North almost doubles employment in the Centre and the South, while women with upper secondary education levels show the highest mean value across the educational distribution. Women are mainly em-

ployed in the service sector, accounting for almost 8 million workers on average. The sub-sector employing the highest number of women is education, human health and social work activities with more than 2.5 million workers on average (the so-called care sector), wholesale retail trade, repair of motor vehicles and motorcycles with 1.3 million workers, administration and support services and other services over 1 million workers on average along the 2008-2020 period under consideration.

4. Detecting She-recession

From long-term feminization to hysteresis

Economic shocks, such as the Covid-19 crisis, may induce hysteresis effects, impacting structural unemployment in particular. Dosi *et al.* (2018) identify three main channels of recessions inducing hysteresis in unemployment and output growth: decrease in productivity, skills deterioration, and firm entry dynamics. In relation to unemployment, during recessions, firms fire workers and unemployment rises. If recessions are deep, recovery will be slower and less powerful, causing an increase in the duration of unemployment which, in turn, implies skills deterioration: long-term unemployed workers stop learning by doing processes, miss to acquire new techniques of production, are less likely to find a job, and whenever it occurs, their skills have deteriorated and their productivity will be lower. Two important side effects emerge. First, an increase in the duration of unemployment raises structural unemployment, typically hysteretic through skills' deterioration, which induces further lengthening of unemployment duration. At the same time, structural unemployment largely characterizes female labour market status. In Italy, female structural unemployment, namely unemployment status with a duration longer than 12 months, has always been higher than the male one, and, on the contrary, employment and participation rates have always been much lower for women than for men⁸, and below EU average⁹.

As a consequence, long-term unemployed people may exit the labour market, because of the strong feeling of discouragement and transiting into

⁷ We choose the cohort of age of 15 and over since it is the one that is common to all three variables, since age 15-64 is not available for structural unemployment. By the same token, ISTAT do not provide data for long-term unemployment from 1977 as for inactivity and employment, hence we use data from 1993.

⁸ See Table C1 in the Appendix.

⁹ For instance, in 2019 before the pandemic, female employment in Italy was 53.8% vis-à-vis 67.5% as average in the European Union, 27 members, Eurostat (Figure B1 in the Appendix).

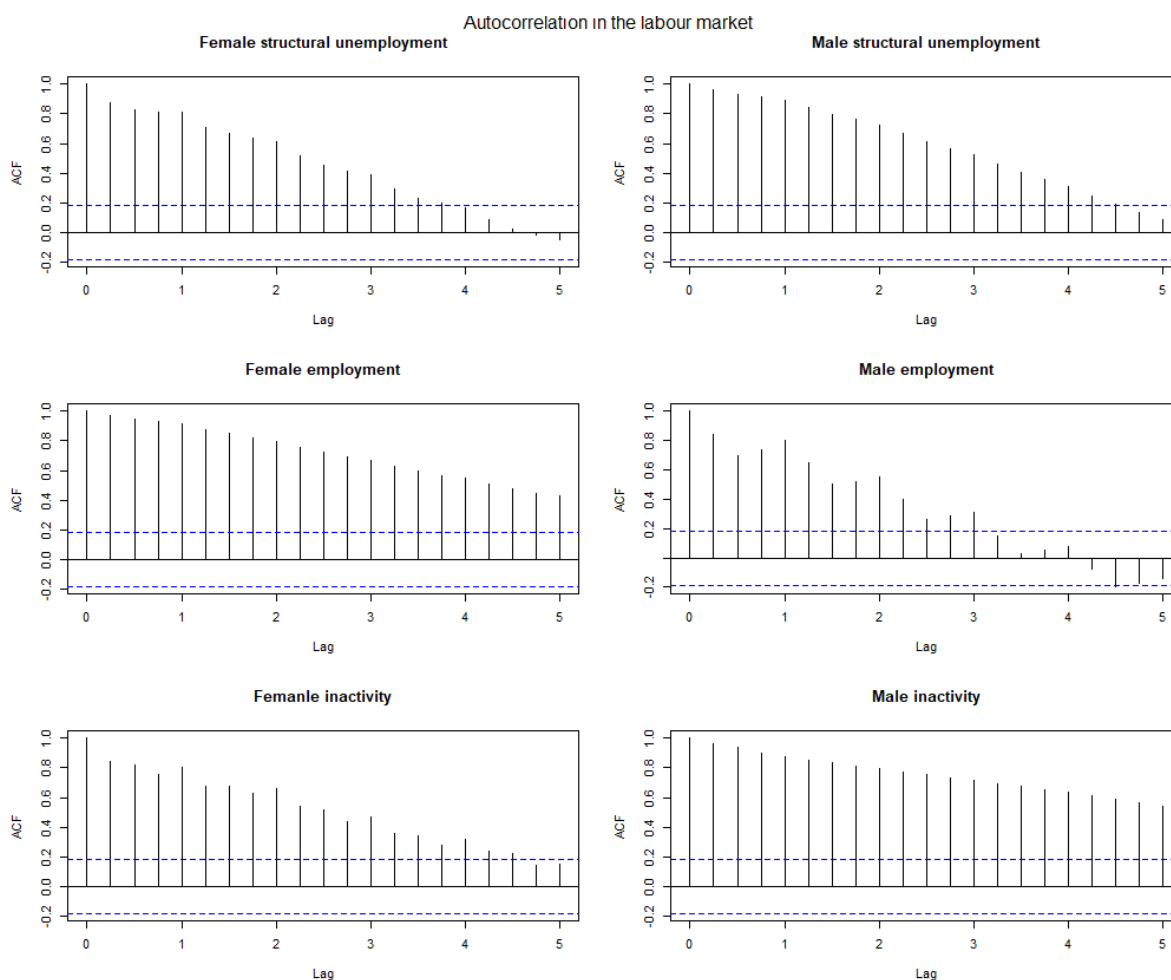
inactivity. Discouragement particularly characterized the labour market dynamics during the Covid-19 crisis both for men and women: ISTAT counts a trend variation of 1 million and 200 units of inactive workers already in March 2020 compared to March 2019¹⁰. The increase in inactive workers during the pandemic can be due to the persistence of precariousness and high unemployment in the Italian labour market.

In fact, occupational segregation, access to education and precariousness of female labour market participation present strong persistence over the long run, and in that have affected the labour market dynamics during the pandemic phase. In Figure 9, the autocorrelation functions for structural un-

employment, employment and inactivity by gender are shown. All variables, both male and female, are strongly correlated with their past values, although with a decaying memory. The time-lasting memory of the variables provides for first evidence about how an individual current status in employment, unemployment, and inactivity is deeply affected by past outcomes.

Figure 10 shows the change in employment, structural unemployment and inactivity rate in total and by gender from the last quarter of 2019 to the last quarter of 2020. The strong increase in the inactivity rate between the first and the second quarter of 2020 is evident both for men and women. In parallel, both the employment and the unemployment rate decrease, the latter

Figure 9. Autocorrelation in the Italian Labour market by gender, quarter lags, age 15 and over



Source: Authors' elaboration; data source: Labour Force Survey, ISTAT

10 Age 15-64, inactive workers in March 2019 were 13,016,046 and 14,223,474 in March 2020 (data source: Labour Force Survey, ISTAT). 10% of trend variation of inactive workers during the second quarter of 2020, corresponding to 1 million and 310 thousand units more compared to 2019.

being higher for women than for men. These trends give evidence of the strong discouragement effect impacting the Italian workers during the Covid-19 crisis.

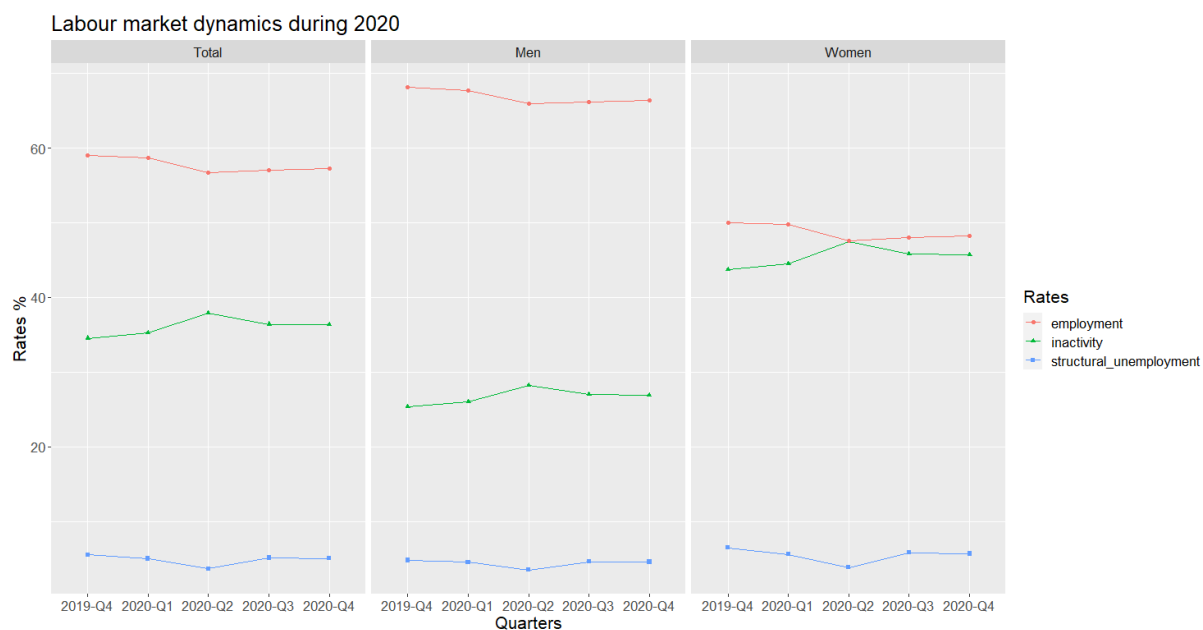
Figure 11 shows the level of employment by gender during 2020 and the percentage changes from quarter to quarter. The decrease is stronger for women only during the second quarter of 2020 (-2.24% vis-à-vis -1.04% for men), despite male employment increases during the third quarter, it decreases during the last one while female employment increases.

Figure 12 shows the percentage change from the previous quarter in employment by gender in macro sectors. Looking at the impact on total employment in the first quarter of 2020, it is evident the decline in all sectors compared to the last quarter of 2019, as in the second quarter of 2020, especially for wholesale, retail and trade, accommodation and food and services. The decrease is harsher for female employment. In the third quarter of 2020, both female and male employment in wholesale, retail and trade, accommodation and food and in services overall increased compared to the previous quarter, while manufacturing and other services (including arts, entertainment and recreation) kept decreasing. It is interesting to notice the relevant

changes in female employment in construction and agriculture. As claimed by Rubery and Rafferty (2013), women cover buffer positions in male-dominated sectors and thus are more subject to cyclicity.

Within the service sector (Figure 13), accommodation and food, wholesale and retail trade, other services arts, entertainment and recreation, and other service activities¹¹ have been the most affected. Male employment in accommodation and food, as expected, shows the highest variability across quarters, with a seasonal increase in the third quarter followed by a decrease in the fourth quarter of 2020. For women the losses look to be more structural and persistent: while the summer increase in accommodation and food is much lower when compared to the decrease in the final quarter, the losses in employment in other sectors are quite persistent even during the final quarter, except for the care one. Compared to men, female employment shows deeper negative changes in transportation and storage and in wholesale and retail trade during the first quarter of 2020, in wholesale and retail trade in the second quarter and in other service sectors such as financial, communication activities, other services, public administration in the last quarter of 2020.

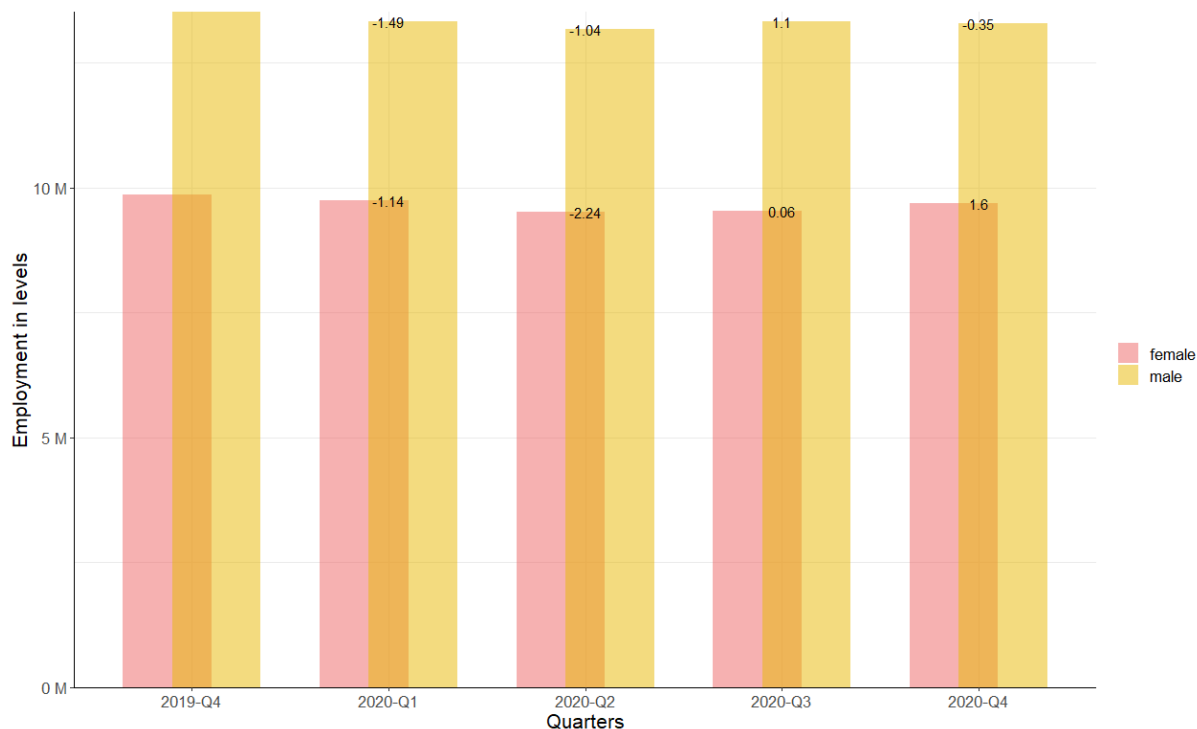
Figure 10. Employment, structural unemployment and inactivity rates by gender in Italy during 2020, age 15 and over, quarterly data



Source: Authors' elaboration; data source: Labour Force Survey, ISTAT

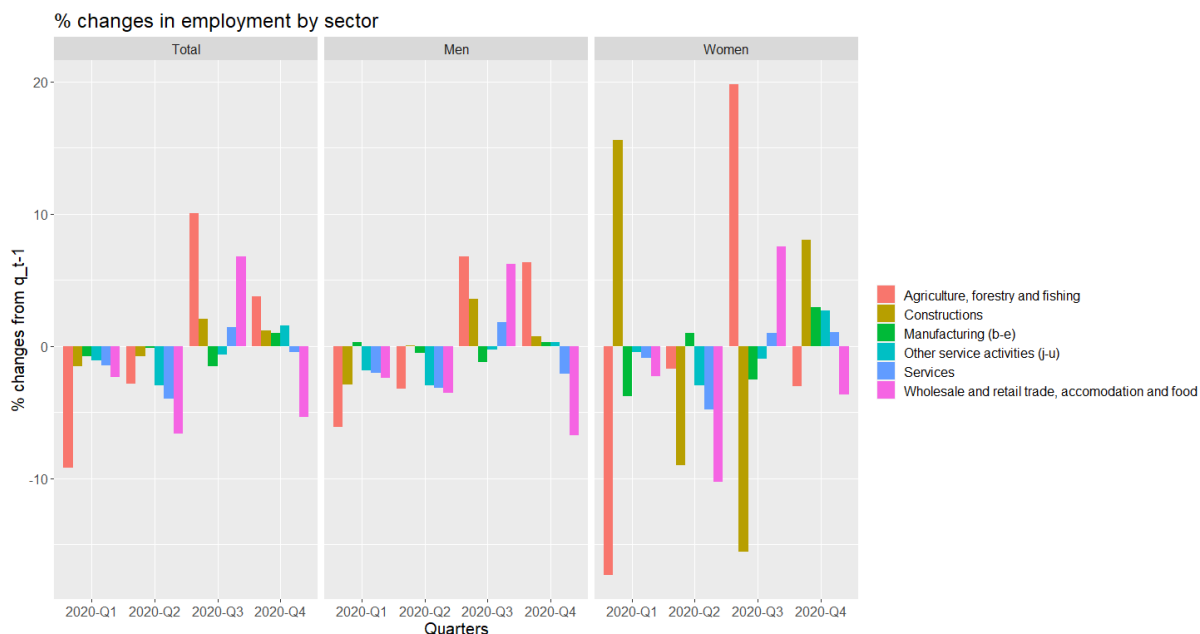
11 Including the activities of membership organizations, the repair of computers and personal and household goods and a variety of personal service activities, activities of households as employers, undifferentiated goods and services producing activities of households for own use.

Figure 11. Levels of employment and quarterly changes by gender in Italy during 2020, age 15 and over



Source: Authors' elaboration; data source: Labour Force Survey, ISTAT

Figure 12. Employment changes from the previous quarter in macro-sectors by gender during 2020, age 15 and over

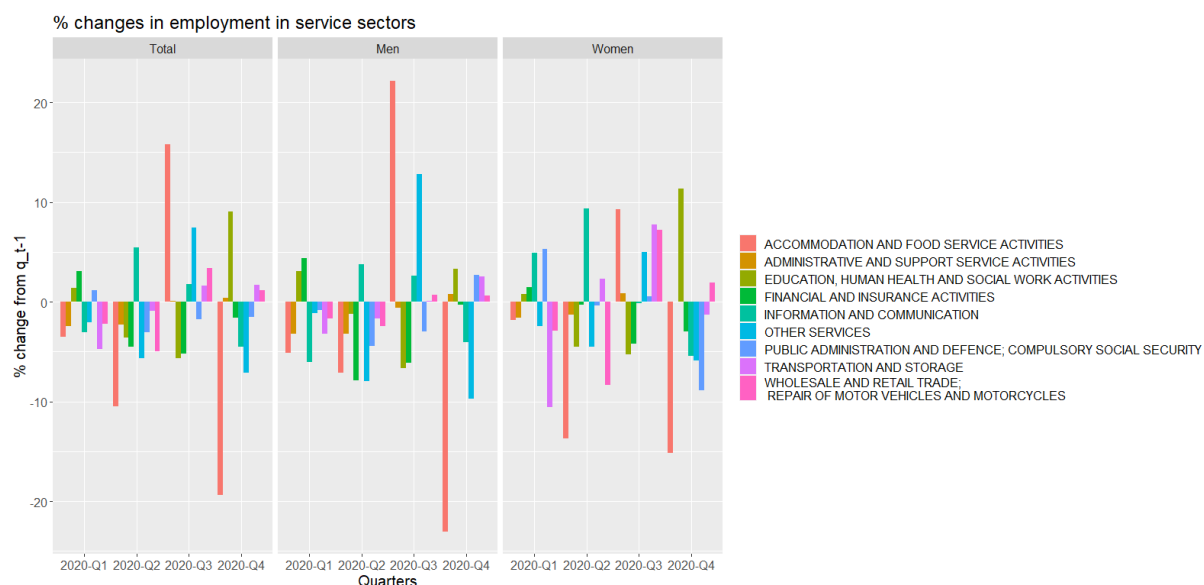


Source: Authors' elaboration; data source: Labour Force Survey, ISTAT

While exhibiting long-term memory patterns, typical of unit root variables, the analysis of autocorrelation functions is not enough to actually measure persistence in the duration of negative shocks for labour

market outcomes. In the next section, we are going to focus on the measurement of hysteresis in labour market outcomes for female workers and the extent to which a She-recession has occurred.

Figure 13. Employment changes from the previous quarter in the service sectors by gender during 2020, age 15 and over



Source: Authors' elaboration; data source: Labour Force Survey, ISTAT

Loss functions and their distribution

The evidence presented so far, although accounting for structural patterns and pandemic labour market effects, is still not conclusive of the extent to which a She-recession has occurred. We advance therefore with a direct measurement of losses in line with the methodology proposed by Fazzari and Needler (2021). The indicator measures whether the impact of the Covid-19 crisis has been disproportionate for a given gender category. We compute such statistics for employment losses, structural unemployment, and inactivity compared to the pre-recession trends. To account for the severity of the event in a hysteresis type of framework (i) we select structural unemployment (unemployment longer than 12 months, not simple unemployment) and inactivity as variables of interest being characterized by strong persistence; (ii) our statistics, being loss functions, assess the *depth*, *duration* and *diffusion* of the Covid-19 crisis, measuring deviations and duration of such deviations from the pre-crisis trend. In addition, focusing on the female employment impact, we then analyze heterogeneity across levels of education, regional and sectoral distribution within female employment to identify their underlying role in the disproportionality/proportionality of the pandemic effects.

We improve the methodology of Fazzari and Needler (2021) by (i) capturing hysteresis on the Italian labour market by considering structural unemployment and inactivity other than employment; by (ii) adopting a long-run perspective filtering the data with a trend starting in 1993 in order to account for long-run deviations from existing trends, while Fazzari and Needler (2021) apply a short run trend; (iii) by adopting the Christiano-Fitzgerald filter instead of a linear trend. The Hodrick Prescott filter is applied as a robustness check to show that the results are not driven by the choice of the filter. The use of the filter allows us to clean up the short-run components of the series and to focus on the structural ones, being our interest in the lasting impact of the feminization of the labour market as a possible pre-condition explaining the effects of the short-run Covid-19 crisis.

To compute the key statistic, we follow six main steps:

1. prior-recession peak and trough identification.

We firstly define the recession period following the three main criteria adopted by the NBER¹²: *depth*, *duration* and *diffusion*.

As cited by Claessens *et al.* (2009), "a recession begins just after the economy reaches a peak of participation and ends as the economy reaches its trough".

12 See NBER Business Cycle Dating Committee guidelines.

In terms of *depth*, a recession can be defined as severe when output declines more than 3.15% (Claessens *et al.* 2009); its *duration* is defined between the first peak and the first trough, namely by the time span between the first decrease of -3.15% (or more) and the first increase greater or equal to +3.15%. To address *depth* and *duration*, we identify the prior-recession peak and the first trough looking at GDP growth, following NBER Business Cycle Dating Committee guidelines.

Figure 14a shows the *annual trend variation* of GDP growth (grey line) and of total employment (dashed line) between the last quarter of 2019 and the second quarter of 2021 compared to the corresponding quarter of the previous year. In addition, we also show the cumulative variation of GDP to give an account of the persistent negative dynamics of the variable. The prior-recession peak is the last quarter of 2019 since the first drop is lower than -3.15% (-6.36%) and occurs during the second quarter of 2020. The trough is the last quarter of 2020, since the first trend variation over +3.15% is the first quarter of 2021. The end of the recession is then the last quarter of 2020 (2020-Q4). Total employment follows the annual trend variation of GDP.

Figure 14b shows the cyclical variation of GDP growth (grey line) and employment (dashed line), namely the percentage change compared to the previous quarter, together with the cumulative GDP variation (red bars). Despite the cumulative cyclical variation being still negative, the GDP growth increased by about 14% during the third quarter of 2020, thus the trough is the second quarter of 2020 (2020-Q2).

Therefore, we identify the last quarter of 2019 as the pre-recession peak and the last quarter of 2020 as trough with respect to the trend, while the second quarter of 2020 with respect to the cyclical variation. Estimates are pursued using both time spans.

As a result, (i) the identification of the peak and the trough allows us to measure the *duration* of the recession, to define the time span of the impact of the Covid-19 crisis on the Italian labour market (longer for annual trend with respect to cyclical variations); (ii) the identification of the peak and the trough with respect to the severity of GDP growth variation explains the *depth* of the recession, while actual data of the varia-

bles of interest at the peak signal the proportionality of the impact for the category of worker we are considering; (iii) comparing employment, structural unemployment, inactivity and female employment by education, by regions and by sectors explains the *diffusion* of the recession.

2. *Isolation of trend and cyclic data components.* To capture the impact of the Covid-19 crisis, we look at the differences between actual and filtered data over the defined recession period. In particular, the filter captures the state of the economy in the previous phase. However, the trend is calculated over a long-run horizon, starting in 1993 to account for any hysteretic pattern in the series analysed, in line with the evidence presented in Section 2.

Each time series is filtered by the Christiano-Fitzgerald filter (CF from now on), to detach the trend from the cycle, namely the variation from trend as a consequence of shocks. The Hodrick-Prescott filter (HP) is applied as a robustness check (description and estimates are provided in the Appendix), since the HP extracts a trend that is comparable to the linear trend adopted by Fazzari and Needler (2021) in our case, so it allows us to make a comparison and robustness checks¹³.

The CF filter decomposes a time series $\{x_t\}_{t=1}^T$ into its trend and cyclical components. Assume we have a stochastic process

$$x_t = y_t + x'_t$$

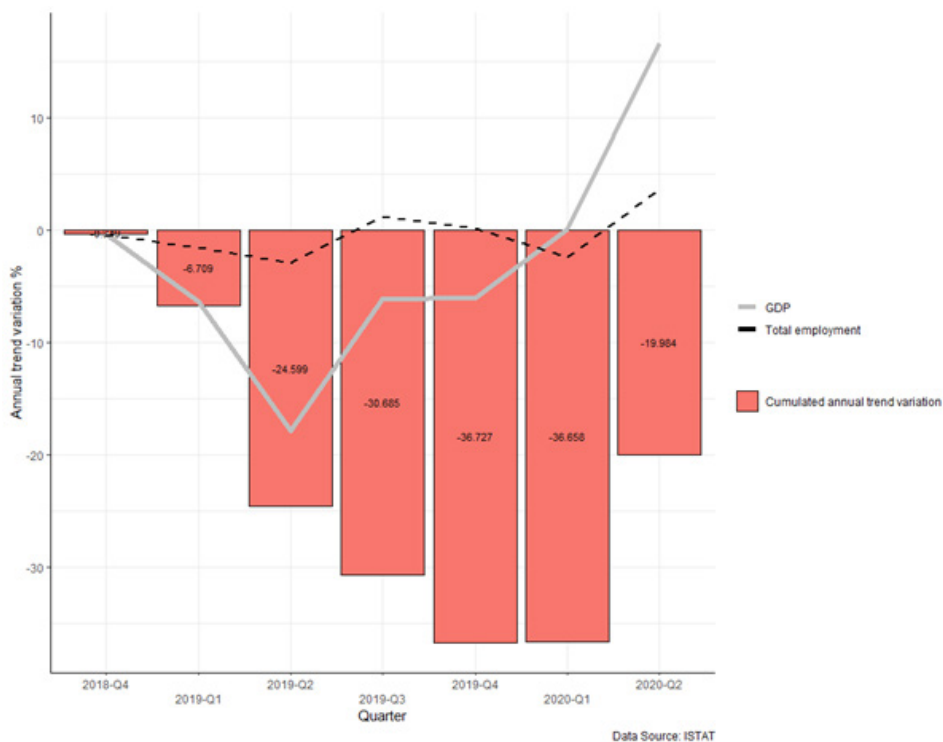
where y_t is a process oscillating between $2 < p_l < p_u < 2$ and the frequencies for which y_t has power are limited to $\{(a,b) (-a,-b)\} \in (-\pi,\pi)$ where $a=2_\pi/p_u$ and $b=2_\pi/p_l$. For what concerns our analysis, $p_l=6$ and $p_u=32$, since cyclical components in a business cycle last from a minimum of six quarters (18 months with monthly data, 1.5 years with annual data) and a maximum of 32 (96 months, 8 years) hence $a=2_\pi/32$ and $b=2_\pi/6$ (Baxter and King 1999; Christiano and Fitzgerald 2003; Hodrick and Prescott 1997).

x'_t is a process oscillating in the complement interval in $(-\pi; \pi)$ (Fitzgerald and Christiano 1999). The CF filter approximate y_t with y'_t a filter that is a linear function, a projection of y_t onto x'_t of the raw data x_t ; for $t = 1, \dots, T$

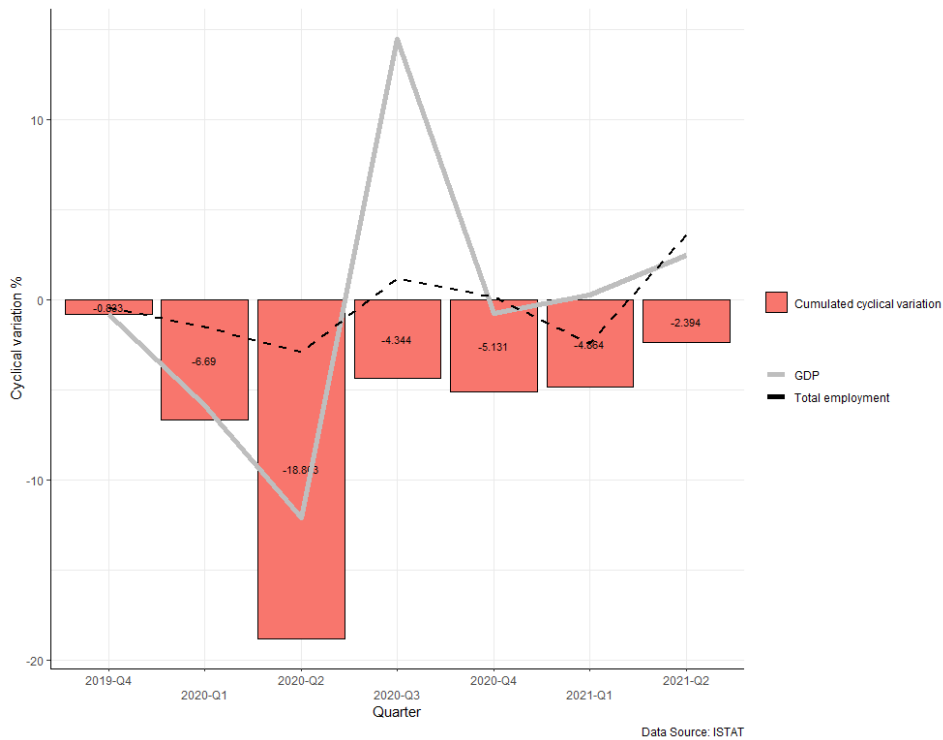
13 According to Christiano and Fitzgerald (2003), for what concerns the analysis of business cycles with quarterly data, there are no big differences between their method and the HP filter, which is widely used in the literature to analyse economic phenomena with quarterly data (Christiano and Fitzgerald 2003; Baxter and King 1999). We did not use the Baxter-King filter since it dropped some observations at the beginning and at the end of the series and given that in our time series the last quarters correspond to the Covid-19 crisis we can't drop these observations.

Figure 14. Annual and cyclical variations in GDP and total employment

a. Pre-recession peak identification: annual trend variation of GDP growth and employment compared to the corresponding quarter of the previous year (from 2019-Q4 to 2021-Q2 compared to 2018-Q4 and 2020-Q2)



b. Pre-recession peak identification: cyclical variation of GDP growth and employment compared to the previous quarter between 2019-Q4 and 2021-Q2



Source: Authors' elaboration; data source: National Accounts, ISTAT

$$\hat{y}'_t = P[y|x] = \sum_{j=-f}^p \hat{B}_i^{p,f} x_{t-j}$$

where $f = T - t$ and $p = t - 1$. The weights are chosen to minimise the mean square error between y_t and \hat{y}'_t that is $\hat{B}_i^{p,f}$ solves

$$\min_{\hat{B}_i^{p,f}} E[(y_t - \hat{y}'_t)^2 | x]$$

x_t is represented as a moving average of order q to avoid the filter to depend on time and non-stationarity of the series. As a result, we get two time series: a trend and a cycle, representing the deviations from the trend.

3. *Loss function definition.* We compute a loss function L comprehending the loss in employment, increase in structural unemployment and inactivity by gender and loss in female regional employment, by level of education and sectoral distribution as the cumulative sum of the CF cycle values:

$$L_{x_{ij}} = \sum_{t=Q1_{2020}}^T c_{x_{t,ij}}$$

where $x = \epsilon, u, i$ is the labour market variable (employment, structural unemployment and inactivity), $i = g, e, r, s$ is the type of individuals we are analysing by gender, female education, female regional employment and female employment across sectors respectively, j is the category for each type namely $j = w, m$ for women or men for $i = g$ gender; $j = p, ls, us, t$ primary, lower secondary, upper secondary and tertiary level for $i = e$ female education; $j = n, c, s$ North, South¹⁴ or Centre of Italy for $i = r$ female regional employment, $j = a, c, i, s$ for $i = s$ female employment by macro-sectors. The analysis is deepened also across 9 service subsectors. T is either the last quarter of 2020 or the second quarter of 2020¹⁵.

4. *Share of each category over the total loss function.* We compute the percentage of the loss $L_{x_{ij}}$ for each j on the total loss function for category i , $L_{x_i} = \sum_{j=1}^J L_{x_{ij}}$

$$l_{x_j} = \frac{L_{x_{ij}}}{L_{x_i}} \%$$

5. *Share of each category of total data at prior-recession peak.* We compute the share of each category j of type

of individuals i for each variable over time x_t of actual data at the prior-recession peak $t = p$, the first quarter of 2019 (2019-Q4):

$$s_{x_{ij}} = \frac{x_{p,ij}}{x_{p,i}} \%$$

6. *Quarter loss (QL) indicator*¹⁶. We take the ratio between the share of losses l_{x_j} over the share of actual data of variable 2019-Q4 s_{x_i} :

$$QL_{x_{ij}} = \frac{l_{x_{ij}}}{s_{x_{ij}}}$$

where the denominator captures the persistence in gender, educational, geographical and sectoral distribution inequality over time. The *quarter loss* is interpreted as follows:

$QL_{x_{ij}} \in [0,1]$ *impact of the crisis less than proportional*

$QL_{x_{ij}} > 1$ *impact of the crisis more than proportional*

Results

In what follows, we provide the results of our estimation of loss functions. Figure 15 shows the female and male losses in employment, structural unemployment and inactivity, corresponding to the area in grey during the recession period between the prior-recession peak (2019-Q4) and the last quarter of 2020 (2020-Q4). Figures B3, B4 and B5 in the Appendix show the quarter loss areas compared to the 2020-Q2 trend. The area in female employment appears wider than for men, while for structural unemployment and inactivity there is no evident gender difference.

Table 1 reports the *quarter loss* (QL) indicator and the shares behind it. Column 1 highlights the trough of the recession period, 2020-Q2 or 2020-Q4, columns 2 and 3 show the percentage by gender of the deviation from trend for women and men l_{ij} where $i = g$ corresponds to gender and $j = w, m$ w for women and m for men, the numerator of the QL indicator; Columns 4 and 5 show the share by gender in actual data at the prior-recession peak s_{ij} which captures the persistence of gender differences in the Italian labour market over time being the denominator of the QL indicator. Columns 6 and 7 report the QL indicator for female and male workers respectively.

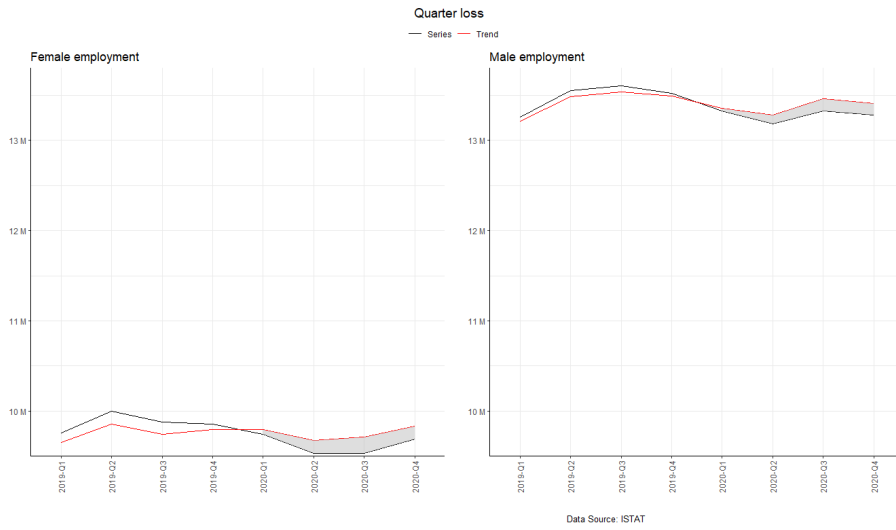
14 Islands are included as southern regions.

15 2020-Q4, if considering the trend variation of GDP to define the recession period (see step 1) ⁸2020-Q2, if considering the cyclical variation to define the recession period, (see step 1).

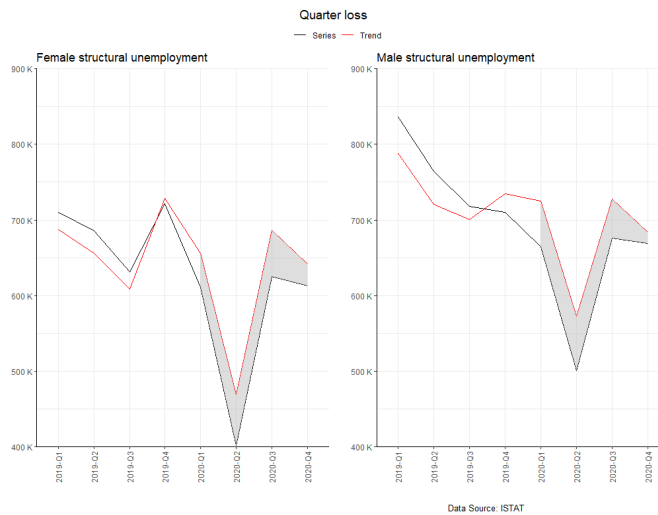
16 Fazzari and Needler (2021) define their measure as *job monthly loss*.

Figure 15. Employment, structural unemployment and inactivity by gender filtered data up to 2020-Q4, quarter loss in grey

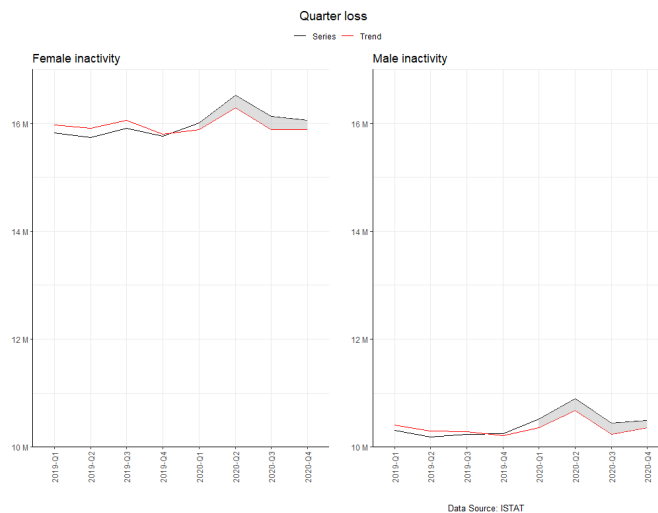
a) Filtered employment data by gender by the Christiano-Fitzgerald filter, *quarter loss* in grey



b) Filtered structural unemployment data by gender by the Christiano-Fitzgerald filter, *quarter loss* in grey



c) Filtered inactivity data by gender by the Christiano-Fitzgerald filter, *quarter loss* in grey



Source: Authors' elaboration

Table 1. Quarter loss in employment, structural unemployment and inactivity by gender considering both the second and the last quarter of 2020 as the trough of the recession

Employment						
T	$l\epsilon_{g,w}$	$l\epsilon_{g,m}$	$s\epsilon_{g,w}$	$s\epsilon_{g,m}$	QL_w	QL_m
2020-Q2	42.90	57.095	42.157	57.843	1.018	0.98
2020-Q4	57.289	42.711	42.157	57.843	1.359	0.73
Structural unemployment						
T	$lu_{g,w}$	$lu_{g,m}$	$su_{g,w}$	$su_{g,m}$	QL_w	QL_m
2020-Q2	20.17	79.83	50.38	49.62	0.40	1.60
2020-Q4	50.564	49.436	50.382	49.618	1.004	0.99
Inactivity						
T	$li_{g,w}$	$li_{g,m}$	$si_{g,w}$	$sx_{g,m}$	QL_w	QL_m
2020-Q2	35.21	64.78	60.603	39.39	0.58	1.64
2020-Q4	51.459	48.541	60.603	39.397	0.849	1.23

Source: Authors' elaboration

According to our estimates, the Covid-19 crisis has an impact that is more than proportional for female employment, while less than proportional for men considering both recession periods. The job losses for women account for 42.9% when considering only the first two quarters of 2020 and 57.28% when considering all quarters of 2020 as recession duration. Since actual employment at the prior-recession peak is 42.16% for women, the QL ratio is slightly above 1 in the first case (1.018) and quite consistently above 1 (1.36) in the second case, signalling that, compared to the share of employment before the recession, the job losses have been disproportionate for women. Results for structural unemployment are less straightforward: both female and male structural unemployment decrease and are lower than the trend values (see Figure 15b and Figure B4 in the Appendix). The decrease has a higher impact on men considering the 2020-Q2 recession period, while both indicators are close to unity considering the 2020-Q4 recession period. Considering the entire time span, it looks like there are no relevant gender differences in the impact of the Covid-19 crisis on structural unemployment being in both cases close to the unitary values. The decrease in structural unemployment is mirrored in the increase in inactivity, especially for men. The indicators suggest that the impact is more than proportional for men, especially considering the first-time span (see Figure 15c), while it is less

than proportional for women. This is given by the high hysteresis in female inactivity: considering the second estimate, the loss function is higher for women, as the share at the prior-recession peak is 60.60% for women vis-à-vis 39.40% for men. The Hodrick-Prescott filter confirms the results (Table C6 in the Appendix).

Overall, considering (i) the disproportionate effect for female employment given the low pre-recession employment rate, (ii) the proportionate effect on women in inactivity given the high pre-recession inactivity rates, and (iii) similar losses in structural unemployment, the influence of the past and persistent gender asymmetries on the impact of the Covid-19 crisis represent an amplifier of the She-recession. The more than proportionate effect on male inactivity seems to support the evidence of a high increase in male inactivity observed during the Covid-19 crisis (see Subsection *From long-term feminization to hysteresis*).

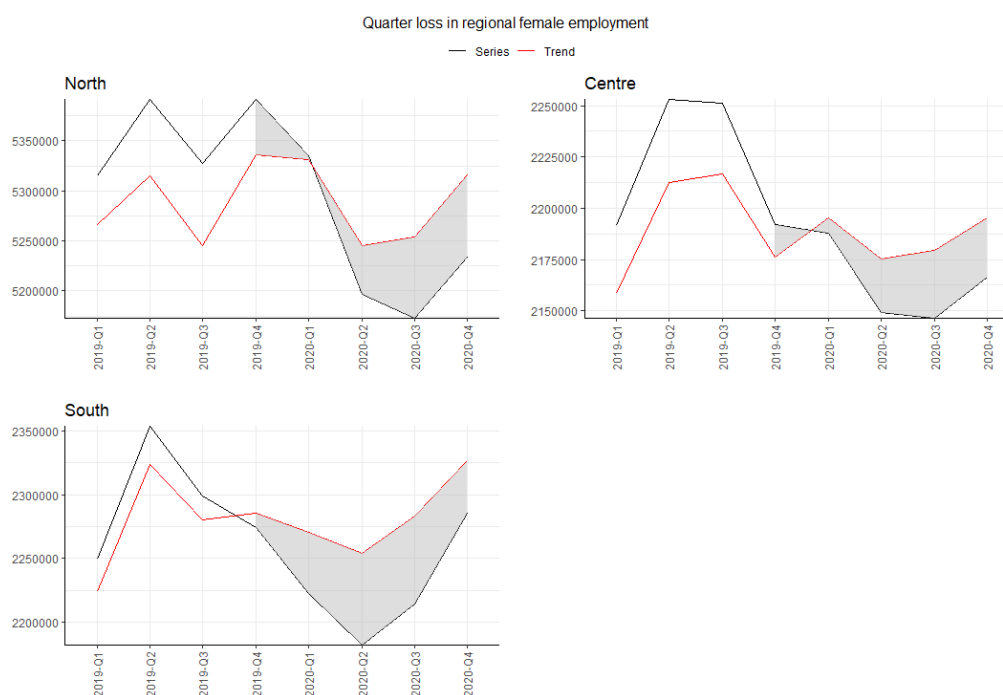
By region, education and sectors

Now, we present some evidence of the impact on female employment by region, education level and sector. Table 2 shows the job quarter loss for women in the North (*n*), Centre (*c*) and South (*s*) of Italy. Women from the South have suffered an impact more than proportional compared to employed women in other regions, considering both time spans, during the first quarters of 2020 the impact has been more than proportional for

Table 2. Quarter loss for female employment in different macro-regions of Italy

Regional female employment									
T	$l\epsilon_{rn}$	$l\epsilon_{rc}$	$l\epsilon_{rs}$	$s\epsilon_{rn}$	$s\epsilon_{rc}$	$s\epsilon_{rs}$	QL_n	QL_c	QL_s
2020-Q2	12.21	24.73	63.06	54.69	22.24	23.07	0.22	1.11	2.73
2020-Q4	39.04	17.93	43.03	54.69	22.24	23.07	0.71	0.81	1.87

Source: Authors' elaboration

Figure 16. Regional female employment data filtered up to 2020-Q4 quarter loss in grey


Data Source: ISTAT

Source: Authors' elaboration

women from the centre of Italy as well. Figure 16 shows the quarter-loss areas.

Table 3 shows the quarter loss in female employment with respect to education.

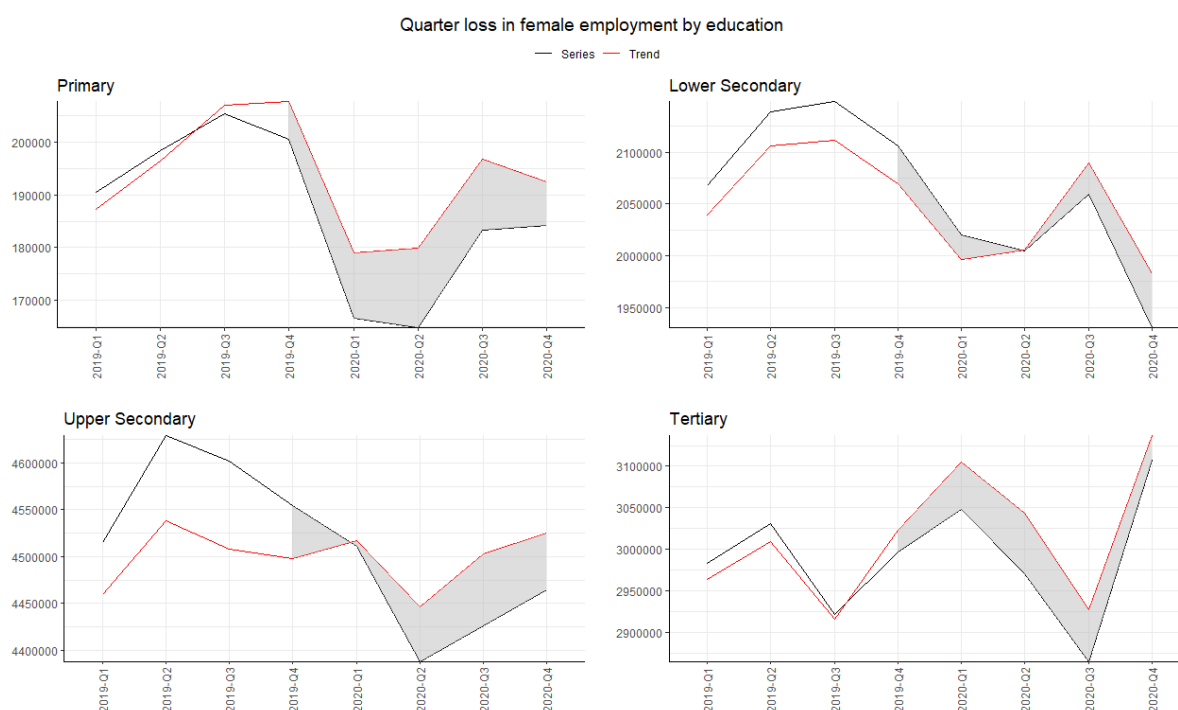
Considering only the first two quarters of 2020 as recessionary periods, the impact is more than proportional for women with primary and lower secondary education, with a QL indicator much higher than 1 (11.24 and 3.07 respectively). Women with tertiary education seem to gain jobs instead. On the other hand, the quarter loss is more than proportional for women with tertiary education considering the entire time span, as for women with primary education. Results are shown in Figure 17 as well. The Hodrick-Prescott filter confirms the results (Table C7 and C8 in the Appendix) except for

education patterns, showing the different sensitivity of the filters (see Figure B6 in the Appendix). This disproportionate result for women with tertiary education derives from the education structure within sectors. Although women with a higher level of education are ex-ante expected to be more resilient to an event crisis, we suggest that the pandemic has hit knowledge workers with tertiary education, such as translators, tourist guides and consultants, these being self-employed workers not covered by the firing restrictions applied by the Italian government. This consideration is supported by the disproportionate effect detected in education, human health and social work activities in the sectoral analysis. Table 5 in fact shows that education, health and social activities account for 51% of losses and the

Table 3. Quarter loss in female employment by education level

Female employment by education												
T	$le_{r,p}$	$le_{r,s}$	$le_{r,h}$	$le_{r,g}$	$se_{r,p}$	$se_{r,s}$	$se_{r,h}$	$se_{r,g}$	QL_p	QL_s	QL_h	QL_g
2020-Q2	22.87	65.43	19.47	-7.82	2.035	21.36	46.197	30.405	11.24	3.07	0.42	-0.26
2020-Q4	9.24	11.27	37.66	41.83	2.035	21.36	46.197	30.405	4.51	0.53	0.82	1.35

Source: Authors' elaboration

Figure 17. Female employment by education level, data filtered up to 2020-Q4 quarter loss in grey


Source: Authors' elaboration

impact is disproportionate for women employed in such sectors, the actual share before the recession being 31%. Precarious contracts and childcare channels may explain the disproportionate effect.

Table 4 and Figure 18 show the quarter losses in female employment in industries, construction, agriculture, and services. The impact has been more than proportional only for women employed in services, in which 84.4% of female workers are employed and accounting for a job loss share of 113%, while women in construction and industries have gained jobs instead (negative values). Results from Hodrick-Prescott filtered data are provided in Table C9 in the Appendix, according to which women employed in the agriculture sector were also subject to a disproportionate impact, looking at only the first two quarters of 2020. The indicator is

1.05 considering the entire period. Considering the importance of the sectoral channel, we deepen the analysis by looking at female employment in 9 different service sub-sectors (Figure 19).

According to Table 5, the quarter losses computed on the entire time span (recession trough 2020-Q4) are above unity for transportation and storage, accommodation and food activities, education, human health and social work activities, the latter being the highest sector of employment for women. On the opposite, information and communication, finance and insurance activities and public administration show instead an increase in employment compared to predicted data, as such jobs can be performed remotely. Estimates with the Hodrick-Prescott filter (Table C10 in the Appendix) confirm the disproportionate impact for transportation and stor-

Table 4. Quarter loss in female employment by macro-sectors

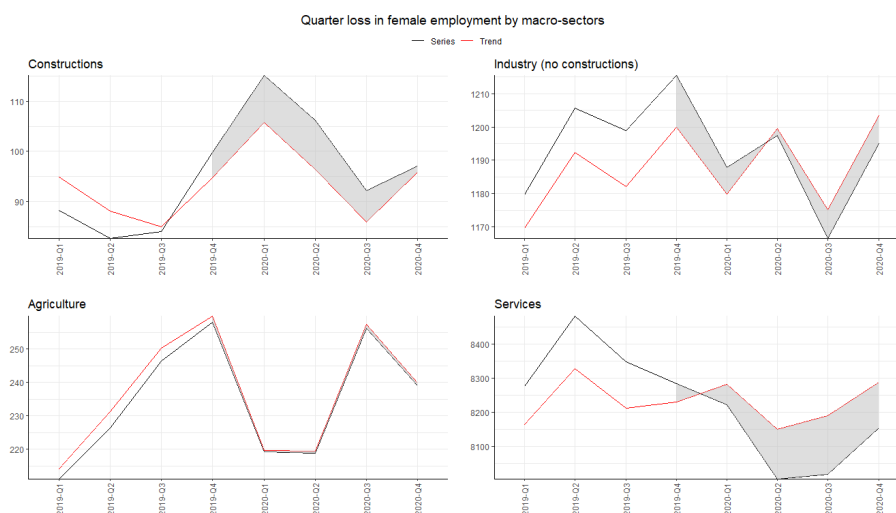
Female employment by macro-sectors												
T	$l\epsilon_{s,a}$	$l\epsilon_{s,c}$	$l\epsilon_{s,i}$	$l\epsilon_{s,s}$	$S\epsilon_{s,c}$	$S\epsilon_{s,i}$	$S\epsilon_{s,a}$	$S\epsilon_{s,s}$	Q_{La}	Q_{Lc}	Q_{Li}	Q_{Ls}
2020-Q2	0.59	-10.58	-3.22	113.21	1.01	12.33	2.62	84.04	0.23	-10.45	-0.26	1.35
2020-Q4	0.65	-5.35	2.23	102.47	1.01	12.33	2.62	84.04	0.25	-5.29	0.18	1.22

Source: Authors' elaboration

Table 5. Quarter loss in female employment in service sub-sectors

Sector	$l\epsilon_{serv}$	$l\epsilon_{serv}$	QL_{serv}
Wholesale and retail trade and repair of motor vehicles and motorcycles	12.3	16.94	0.73
Transportation and storage	5.57	2.9	1.92
Accommodation and food activities	10.7	8.38	1.28
Information and communication	-1.7	2.05	-0.85
Financial and insurance activities	-3.6	3.53	-1.03
Public administration and defence; compulsory social security	-0.05	4.98	-0.01
Administrative and support service activities	13.79	15.57	0.89
Other services	11.37	14.6	0.78
Education, Human health and social work activities	51.68	31.07	1.66

Source: Authors' elaboration

Figure 18. Female employment by macro-sectors, data filtered up to 2020-Q4, quarter loss in grey


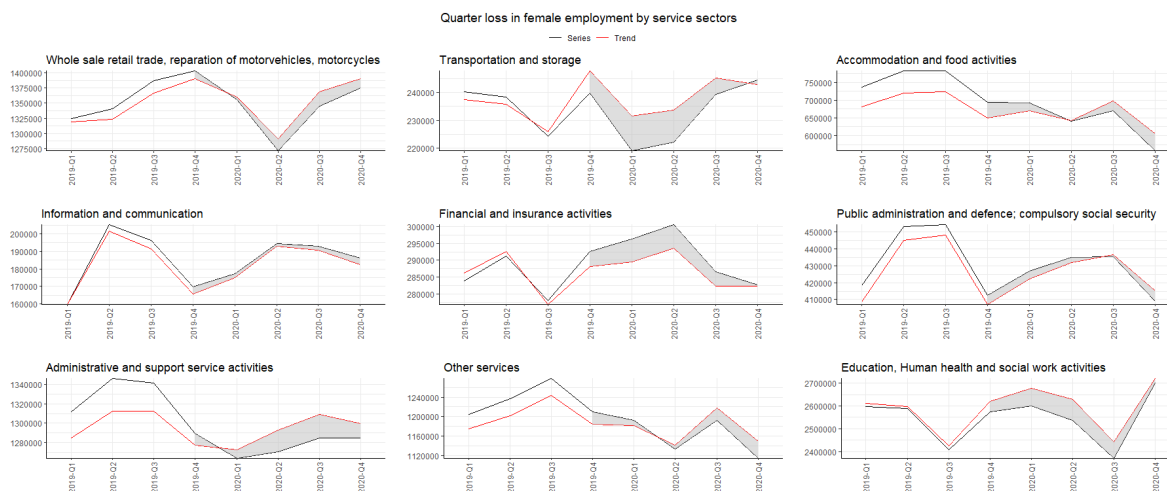
Source: Authors' elaboration

age, accommodation and food but the indicator is above unity also for other services and administrative and support service activities. The indicator is instead below the unity for education, health and social work, although it accounts for an important loss during the third quarter of 2020. As for tertiary education, this is the result of the different sensitivity of the two filters (see Figure B7 in the Appendix), the HP being more linear.

Distribution of disproportionate effects

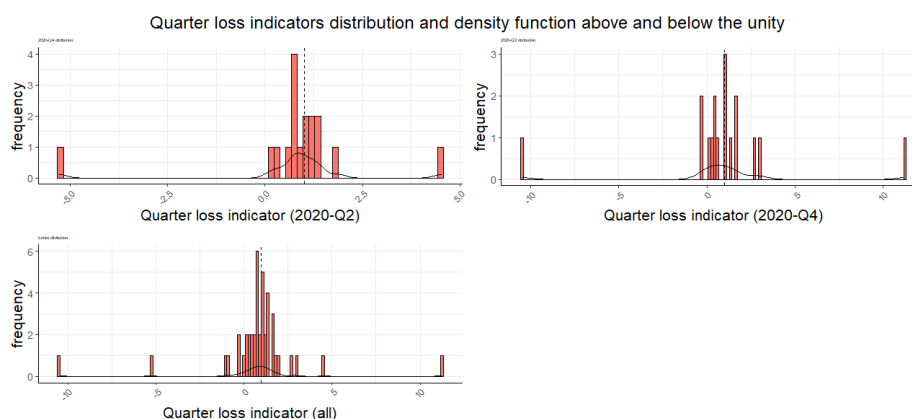
This sub-section has the purpose of showing the distribution of our measure around the unity in order to check the incidence of proportionality vs. disproportionality of events. We provide for the distribution of the QL indicator, checking how often it takes values above or below the unity to have a complete assessment of the range of its dispersion among different

Figure 19. Female employment by service sectors, data filtered up to 2020-Q4, quarter loss in grey



Source: Authors' elaboration

Figure 20. Quarter loss indicators distribution and density function above and below the unity



Source: Authors' elaboration

tests of disproportionality. Figure 20 shows the distribution of the indicator when considering the second quarter of 2020 as the last quarter of the recession period (T=2020-Q2, on the left) compared to the last quarter of 2020 (T=2020-Q4 on the right), and the distribution of all indicators as a third graph. Not surprisingly, the longest recession reports far larger extreme values than the short one. The distribution of all indicators is concentrated between 0.8 and 1.3. Disproportional values (larger than unity) are present but are also balanced by less than proportional ones, considering that we are including all ranges of values of the indicator. Outliers belong in particular to the sectoral distribution.

Conclusions and policy implications

Since the Covid-19 economic crisis has been prompted by an unprecedented health emergency, it has im-

acted the economic system in a completely different manner when compared to standard downturns: in particular, for the first time a stronger impact on female employment has been recorded, while during past recessions, male employment has shown much higher cyclicity (Man-recession). For this reason, the Covid-19 crisis has been defined as a She-recession, because of (i) the industry channel, for which the sectors hit the hardest by social distancing measures are characterized by high shares of female employment, and (ii) the childcare channel, i.e., school closures have increased the childcare burden, especially on women because of gender norms, triggering a transition to inactivity.

However, considering the impact of the recession in an isolated manner, without accounting for pre-pandemic structural asymmetries in gender, geographical distribution and education, risks to underestimate the

root causes of the patterns recorded during the pandemic. While the literature has widely documented gender imbalances in labour market outcomes, such as the gender-pay gap and the lower female participation rate, matters of feminization of the labour markets have been less considered (Cetrulo *et al.* 2023). In addition, although internationally wide coverage has been devoted to documenting the She-recession, less evidence is available for Italy, and particularly with a perspective drawing upon long-term memory processes and hysteresis as fuelling amplifiers of 'temporary' shocks.

This paper aims at measuring and explaining the gender differences in the impact of the Covid-19 crisis on the Italian labour market from a macroeconomic perspective by assessing the depth, duration and diffusion of the recession. In particular, we trace back to pre-existing and persistent gender asymmetries the roots of the She-recession. Our main findings suggest that hysteresis in gender asymmetries amplifies and affects the She-recession manifestation of the Covid-19 crisis, given the disproportionate impact on female employment and proportionate effect on female inactivity. In line with hysteresis in labour markets, women from the South and with lower education levels suffer an impact more than proportionate compared to higher educated women, despite the impact on graduated women being more than proportional when considering all the quarters of 2020 as recession period. On the one hand, the impact on low-educated women can be explained by the industry channel, since they are mostly employed in low-value-added activities mainly hit by the pandemic restrictions. A similar reasoning applies to women working in the South, their activities being concentrated in sectors subject to closures. For women with tertiary education, the childcare channel could be an explanation as the high share of knowledge self-employed workers not covered by the firing restrictions. Evidence from sectoral analysis suggests a disproportionate impact on women working in the service sector and, particularly, in transportation and storage, accommodation and food services but even in education, human health and social work activities. Such a result may explain and be explained by the disproportionate effect on women with tertiary education and the childcare channel. This is out of the scope of this paper, but worthy of further investigation.

More broadly, the results of our analysis indicate, firstly, the structural vulnerability of the female segment in the labour market. Secondly, vulnerabilities are not commonly widespread, and inside the female component, women from the South and employed in low-remunerated service sectors have been the most exposed to job losses, calling for a multidimensional perspective of exposure to risks (Cetrulo *et al.* 2022). In addition, even the broadly defined care sector, including health, education and social care works has been disproportionately hit by the pandemic shock, showing that the so-called *essentiality narrative* of these jobs has not impeded the adverse effects of the pandemic. Thirdly, although the disproportionate impact on women has been documented worldwide, country effects have been different, and in general, whenever more comprehensive welfare state regimes were in place, the She-recessionary effects have been lower. On the opposite, whenever informality and self-employment were higher, the effects of the She-recession were more severe (e.g., in the case of the South of Italy). Granted that the welfare state and care regimes interact, the She-recession has been proven to be deeply related to the ex-ante hysteresis and pre-crisis conditions in the labour market, a phenomenon defined as long-term feminization.

Our results call therefore for policy actions that are meant to overturn long-term feminization, namely, both intra-household and extra-household unequal status of women, mapping into gender asymmetries and discrimination. Beyond the simplistic factual consideration of gender heterogeneity and gender-wage gap, there are deeper institutional, cultural and social norms which reproduce gender imbalances and subordination to unequal societal power (Folbre 2021a), calling it "patriarchy *cum* neo-liberalism". Still, nowadays, gender asymmetries are to a larger extent considered the end result of individual choices, while structurally embedded societal factors, leading to the trap of feminization, have not been put under the spotlight with sufficient attention. Given that women are subject to discrimination in their hiring processes and career advancement, in accepting involuntary part-time contracts and in the decision to enter or not in the labour force because of family culture and constraints, societies should question the acceptability of such status quo and the root-causes that allow gender discrimination to keep reproducing. In addition, female subjects are even more exposed to

adverse effects whenever they are not in a couple and with children, therefore whenever they lack the male counterpart as a presumed element of individual 'security'. Labour market outcomes and household status intersect with other spheres, such as access to healthcare and childcare, reproducing the so-called intersectionality and multi-dimensionality of vulnerability.

So far, policy interventions have been very timid, if not completely absent, in overturning structural gender imbalances¹⁷: while the discourse has usually focused on career upgrading, gender quota, STEM education and female entrepreneurship, no advancement is put forward toward substantive processes of women empowerment, granting higher spaces of decision-making autonomy, equal rights and, in that, overturning occupational segregation. At the same time, no economic policy proposal has envisaged an industrial policy for the care sector, able to grant both equal access to basic rights, such as education and health, and good and stable employment conditions for women (Cresti and Virgillito 2022). An industrial policy for the care sector would at the same time allow to address labour market asymmetries for women and access to basic needs for all, requesting for the State to be a *good* employer. While policy actions have been mostly lacking, a *Care Manifesto* and the notion of a care economy have been emerging in the last years, intersecting the political and academic debates (Chatzidakis *et al.* 2020). In essence, the care economy highlights interdependence among humans, humans and nature, and the need to overturn crystallized class structures and power asymmetries in contemporary societies. Affirming interdependence, the Care Manifesto calls for a new regime of care in which unpaid working time and low-value jobs are deeply revalued and remunerated. However, such policy actions, more than simply fixing market failures, would entail a collective reconsideration of the nature of the current structure of social and economic relations, what Folbre defines as "bargaining for changes" (Folbre 2021b).

Occupational-level, cross-country comparative analyses and measurement of long-lasting She-recessionary effects are further avenues of research together with a deeper accounting of the impact of feminization, largely intended both as a process occurring extra-household in the labour market, but even intra-household, with reference to the gendered division of unpaid la-

bour and effects of gender norms into participation to labour markets.

Appendix

A. The Hodrick-Prescott filter

Assume we have a time series

$$x_t = y_t + \bar{x}_t$$

Spectral analysis provides as instrument to obtain the component y_t , an *ideal bandpass filter*:

$$y_t = B(L)x_t$$

where $B(L) = \sum_{j=-\infty}^{\infty} B_j L^j$ is the filter, L is the lag operator and $B_j = \frac{\sin(jb) - \sin(ja)}{\pi j}$, $B_0 = \frac{b-a}{\pi}$ are the weights. However, the *ideal bandpass filter* can be applied only if data are infinite. The implementation of the Christian-Fitzgerald and the Hodrick-Prescott starts from the necessity to have an instrument able to make this decomposition when data are finite. As a result, these filters apply an approximation of the ideal one (Fitzgerald and Christiano 1999).

The HP filter has the aim to explain fluctuations of aggregate macroeconomic variables over the business cycle, from the long-run path of growth (Hodrick and Prescott 1997). Time series are represented as the sum of a growth and a cyclical component

$$x_t = g_t + c_t \quad t = 1, \dots, T$$

where growth changes smoothly and the cycle component is defined as the deviation from growth path. The aim is to minimise the smoothness of growth, that is:

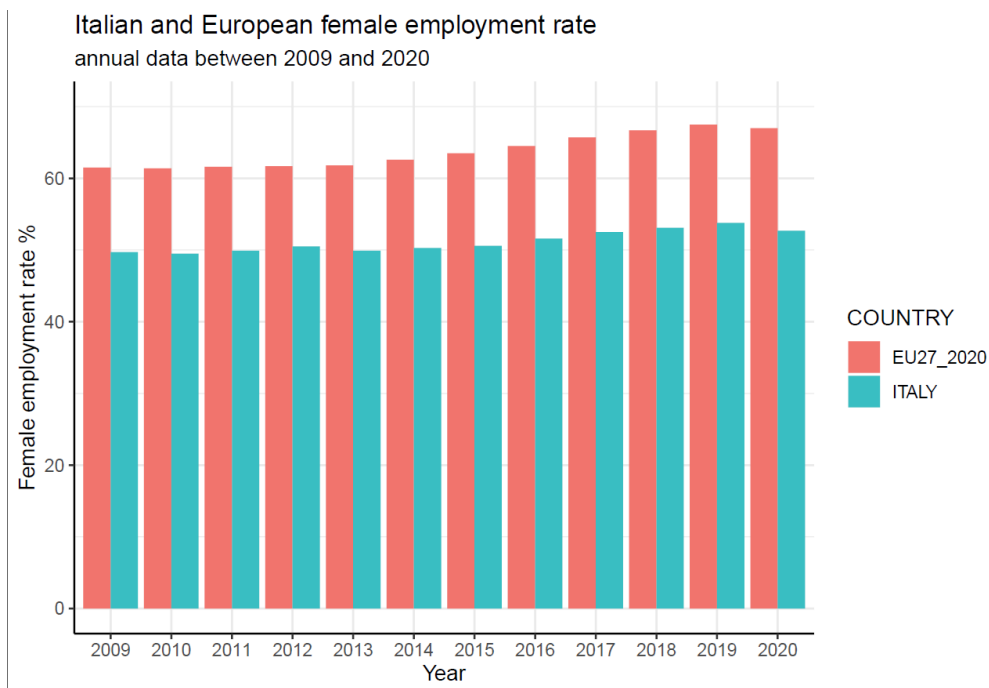
$$\min_{\{g_t\}_{t=1}^T} \left\{ \sum_{t=1}^T c_t^2 + \lambda \sum_{t=1}^T [(g_t - g_{t-1}) - (g_{t-1} - g_{t-2})]^2 \right\}$$

where λ is a penalty parameter, that is a positive number that the higher the variations in growth component the higher the penalty. Assuming the cycle component and the second difference of the growth component with zero mean and constant variances σ_1^2 and σ_2^2 , the penalty parameter is defined as $\sqrt{\lambda} = \frac{\sigma_1}{\sigma_2}$. For quarterly data, Hodrick and Prescott consider a 5 per cent cyclical component and of one per cent change in growth rate in a quarter as moderately large, hence, $\sqrt{\lambda} = \frac{5}{d^{\frac{1}{4}} = 40}$ that is $\lambda = 1,600$.

17 See <https://feps-europe.eu/publication/towards-care-led-recovery-for-the-european-union/>.

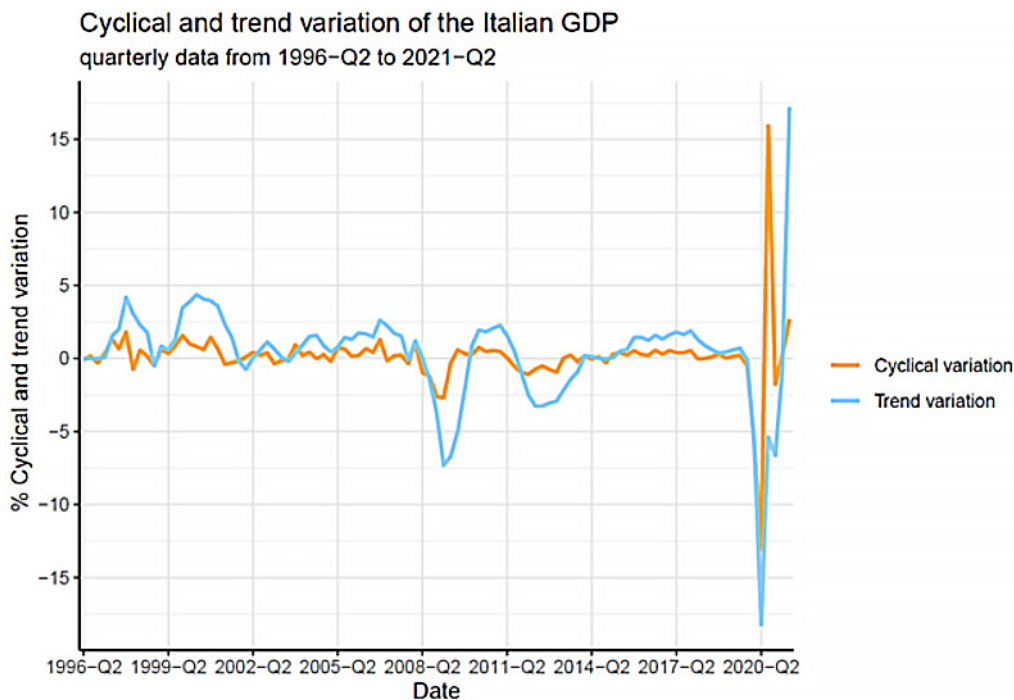
B. Figures

Figure B1. Female employment rate, age 15 and over, comparison between EU-2020 (27 members) average and Italy



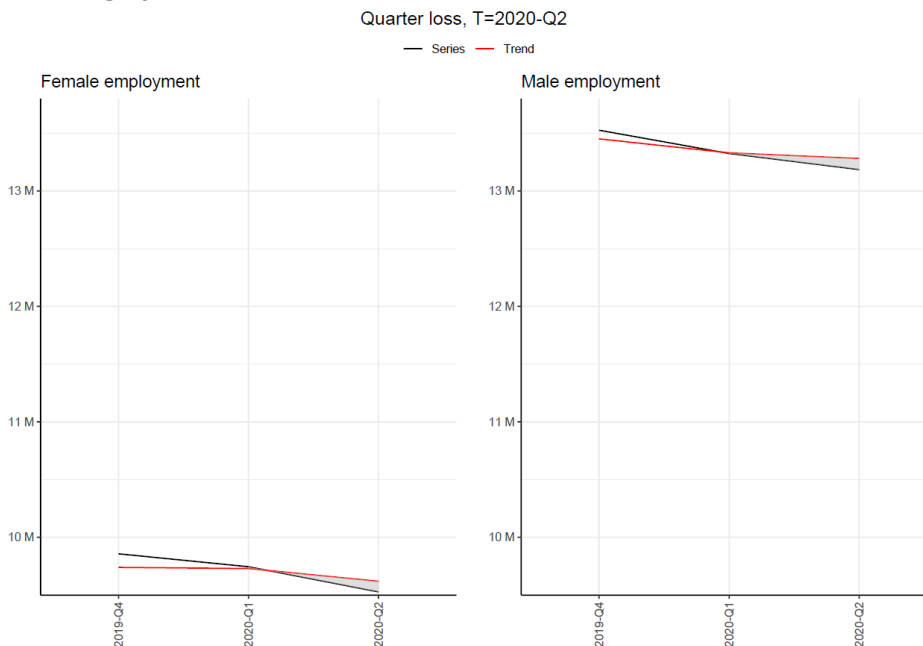
Source: Authors' elaboration; data source: European Labour Force Survey, EUROSTAT

Figure B2. Cyclical and trend variation of the Italian GDP by quarters from 1996 to 2020



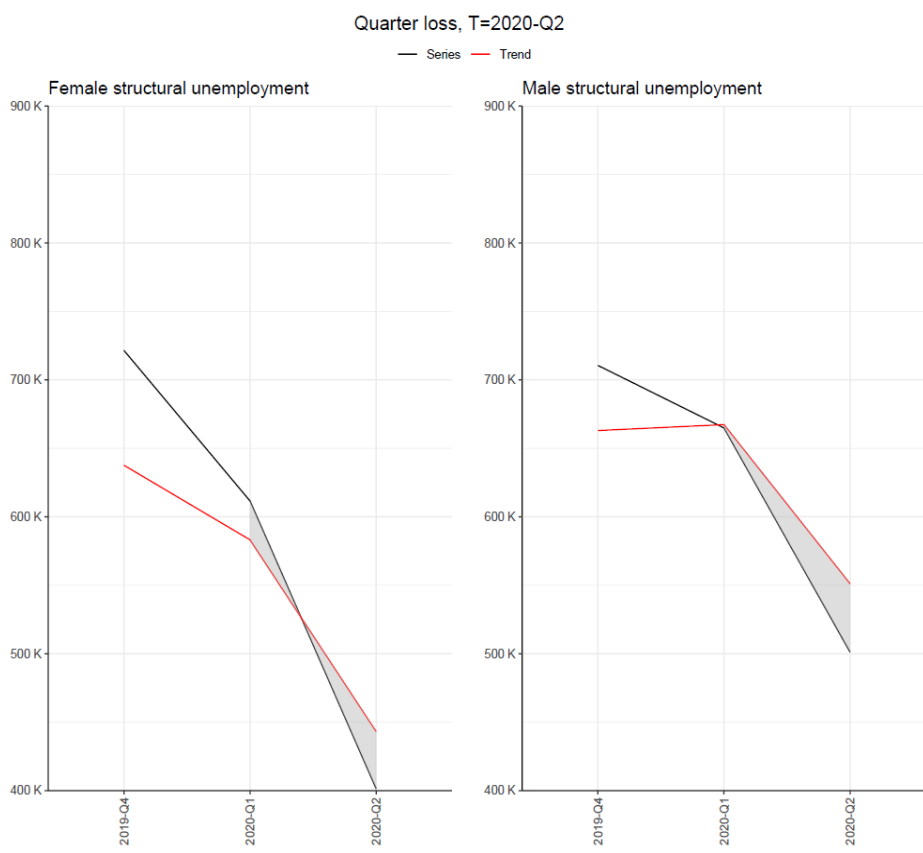
Source: Authors' elaboration; data source: National accounts, ISTAT

Figure B3. Filtered employment data up to the quarter 2020-Q2 by gender by the Christiano-Fitzgerald filters, quarter loss in grey



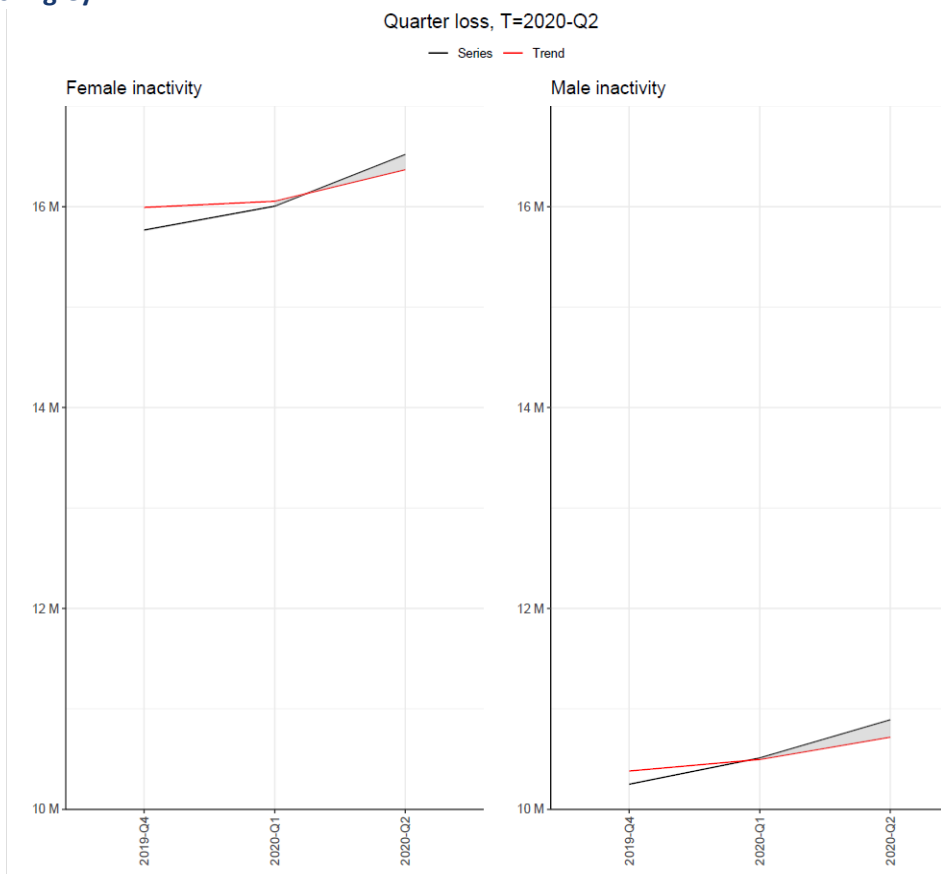
Source: Authors' elaboration; data source: Labour Force Survey, ISTAT

Figure B4. Filtered structural unemployment data up to the quarter 2020-Q2 by gender by Christiano-Fitzgerald filter, quarter loss in grey



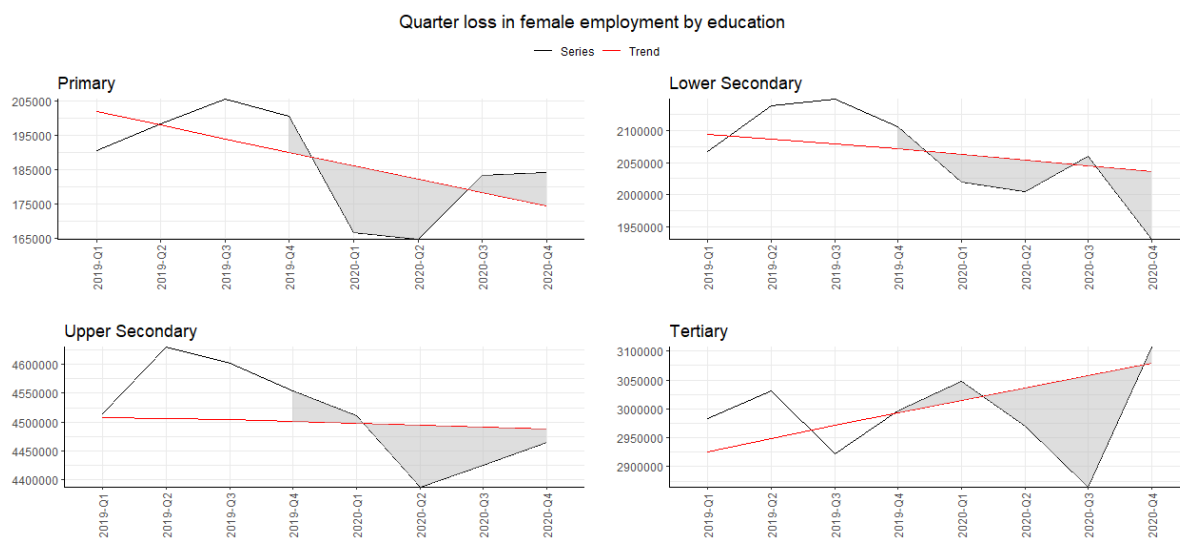
Source: Authors' elaboration; data source: Labour Force Survey, ISTAT

Figure B5. Filtered inactivity data up to the quarter 2020-Q2 by gender by the Christiano-Fitzgerald filter, quarter loss in grey



Source: Authors' elaboration; data source: Labour Force Survey, ISTAT

Figure B6. Female employment by education level, filtered data by Hodrick-Prescott filter up to 2020-Q4, quarter loss in grey



Source: Authors' elaboration; data source: Labour Force Survey, ISTAT

Figure B7. Female employment in service sub-sectors filtered data by Hodrick-Prescott filter up to 2020-Q4, quarter loss in grey


Source: Authors' elaboration; data source: Labour Force Survey, ISTAT

C. Tables

Table C1. Descriptive statistics of the total, male and female employment, structural unemployment and inactivity, quarterly data, age 15 and over

Employment			
Statistic	Female	Male	Total
t: 1993-Q1/2020-Q1	t=112	t=112	t=112
Mean	8,804,935	13,377,585	22,182,520
Median	9,065,017	13,353,464	22,405,984
St. Dev.	736,713.400	253,506.200	802,131.100
Min	7,398,284	12,766,801	20,522,766
Max	9,997,537	13,939,058	23,553,667
Structural unemployment			
Statistic	Female	Male	Total
t: 1993-Q1/2020-Q1	t=112	t=112	t=112
Mean	604,888.900	602,806.400	1,207,695
Median	608,514	550,275	1,161,076
St. Dev.	144,883.100	209,565.500	349,337.600
Min	332,883	290,625	623,508
Max	1,022,043	1,093,141	2,062,632
Inactivity			
Statistic	Female	Male	Total
t: 1993-Q1/2020-Q1	t=112	t=112	t=112
Mean	15,961,169	9,465,930	25,427,099
Median	15,960,906	9,440,054	25,483,066
St. Dev.	275,743.700	705,876.000	898,781.700
Min	15,417,757	8,186,644	24,095,277
Max	16,596,764	10,891,029	27,410,160

Source: Authors' elaboration; data source: Labour Force Survey, ISTAT

Table C2. Descriptive statistics of female regional employment, quarterly data, age 15 and over

Regional female employment			
Statistic	North	Centre	South
t: 2000-Q1/2020-Q4	t=84	t=84	t=84
Mean	4,986,625	2,004,683	2,177,057
Median	5,027,856	2,020,519	2,169,161
St. Dev.	219,108.200	152,710.800	70,179.390
Min	4,433,069	1,633,726	1,959,192
Max	5,391,286	2,252,968	2,353,283

Source: Authors' elaboration; data source: Labour Force Survey, ISTAT

Table C3. Descriptive statistics of female employment by education level, seasonally adjusted, quarterly data, age 15 and over

Female employment by education level				
Statistic	Primary	Lower Secondary	Upper Secondary	Tertiary
t: 2000-Q1/2020-Q4	t=84	t=84	t=84	t=84
Mean	449,410.400	2,250,118	4,367,995	2,100,842
Median	388,812	2,244,788	4,453,724	2,079,064
St. Dev.	217,706.200	132,796.800	221,956.800	557,931
Min	164,703	1,930,380	3,704,025	1,175,015
Max	877,990	2,551,847	4,642,923	3,106,937

Source: Authors' elaboration; data source: Labour Force Survey, ISTAT

Table C4. Descriptive statistics for female employment in macro-sectors, seasonally adjusted, quarterly data, age 15 and over

Female employment by macro-sectors				
Statistic	Agriculture	Industry (no constructions)	Constructions	Services
t: 2008-Q1/2020-Q4	t=52	t=52	t=52	t=52
Mean	238,012.700	1,194,168.000	102,475.900	7,900,942.000
St. Dev.	21,970.100	59,253.030	12,857.300	270,898.500
Min	192,242	1,121,008	82,309	7,461,804
Max	285,696	1,393,379	138,650	8,482,943

Source: Authors' elaboration; data source: Labour Force Survey, ISTAT

Table C5. Descriptive statistics for female employment in service subsectors, seasonally adjusted, quarterly data, age 15 and over

Statistic	N	Mean	St.Dev.	Min	Max
Wholesale and retail trade, repair of motorvehicles and motorcycles	t=52	1,350,212.000	38,889.180	1,263,695	1,437,968
Transportation and Storage	t=52	215,664.700	14,868.440	186,070	247,524
Accommodation and food services	t=52	657,866.900	69,819.430	537,172	808,972
Information and Communication	t=52	173,919.700	12,447.250	142,509	205,232
Financial and insurance activities	t=52	282,109.400	12,803.440	251,640	314,483
Administration and support services	t=52	1,204,422.000	65,243.330	1,083,271	1,346,365
Public administration and defense	t=52	451,678.900	29,169.130	403,661	504,997
Education, human health and social work	t=52	2,406,468.000	118,035.900	2,209,399	2,700,402
Other services	t=52	1,158,601.000	96,157.810	875,814	1,278,327

Source: Authors' elaboration; data source: Labour Force Survey, ISTAT

Table C6. Quarter loss with respect to the Hodrick-Prescott filter in employment, structural unemployment and inactivity

Employment						
T	$l\epsilon_{g,f}$	$l\epsilon_{g,m}$	$s\epsilon_{g,f}$	$s\epsilon_{g,m}$	QL_f	QL_m
2020-Q2	47.878	52.122	42.157	57.843	1.136	0.901
2020-Q4	50.723	49.277	42.157	57.843	1.203	0.852
Structural unemployment						
T	$lu_{g,f}$	$lu_{g,m}$	$su_{g,f}$	$su_{g,m}$	QL_f	QL_m
2020-Q2	52.880	47.120	50.382	49.618	1.050	0.950
2020-Q4	53.053	46.947	50.382	49.618	1.053	0.946
Inactivity						
T	$li_{g,f}$	$li_{g,m}$	$si_{g,f}$	$si_{g,m}$	QL_f	QL_m
2020-Q2	50.840	49.160	60.603	39.397	0.839	1.248
2020-Q4	53.649	46.351	60.603	39.397	0.885	1.177

Source: Authors' elaboration

Table C7. Quarter loss by Hodrick-Prescott filter for female employment in different macro regions of Italy

Female employment by regions									
T	$l\epsilon_{r,n}$	$l\epsilon_{r,c}$	$l\epsilon_{r,s}$	$s\epsilon_{r,n}$	$s\epsilon_{r,c}$	$s\epsilon_{r,s}$	QL_n	QL_c	QL_s
2020-Q2	40.696	22.715	36.58	54.691	22.24	23.07	0.744	1.02	1.586
2020-Q4	47.948	23.169	28.88	54.691	22.24	23.07	0.877	1.042	1.252

Source: Authors' elaboration

Table C8. Quarter loss by Hodrick-Prescott filter in female employment by education level

Female employment by education												
T	$l\epsilon_{r,p}$	$l\epsilon_{r,s}$	$l\epsilon_{r,h}$	$l\epsilon_{r,g}$	$s\epsilon_{r,p}$	$s\epsilon_{r,s}$	$s\epsilon_{r,h}$	$s\epsilon_{r,g}$	QL_p	QL_s	QL_h	QL_g
2020-Q2	7.64	33.874	33.360	25.127	2.035	21.36	46.197	30.405	3.754	1.586	0.722	0.826
2020-Q4	3.76	31.349	31.365	33.521	2.035	21.36	46.197	30.405	1.850	1.467	0.679	1.102

Source: Authors' elaboration

Table C9. Quarter loss by Hodrick Prescott filter for female employment by macro-sectors

Female employment by macro-sectors												
T	$l\epsilon_{s,a}$	$l\epsilon_{s,c}$	$l\epsilon_{s,i}$	$l\epsilon_{s,s}$	$s\epsilon_{s,c}$	$s\epsilon_{s,i}$	$s\epsilon_{s,a}$	$s\epsilon_{s,s}$	QL_a	QL_c	QL_i	QL_s
2020-Q2	13.89	-12.24	0.44	97.91	1.01	12.33	2.62	84.04	5.30	-12.09	0.04	1.17
2020-Q4	2.76	-4.85	6.19	95.89	1.01	12.33	2.62	84.04	1.05	-4.79	0.50	1.14

Source: Authors' elaboration

Table C10: Quarter loss by Hodrick Prescott filter for female employment by service subsectors filtered up to 2020-Q4

Female employment in service subsectors			
	$I\epsilon_{serv}$	$S\epsilon_{serv}$	QL_{serv}
Wholesale and retail trade and repair of motor vehicles and motorcycles	9.27	16.94	0.55
Transportation and storage	3.28	2.9	1.13
Accommodation and food activities	36.7	8.38	4.38
Information and communication	-1.4	2.05	-0.7
Financial and insurance activities	-1.8	3.53	-0.5
Public administration and defence; compulsory social security	2.01	4.98	0.4
Administrative and support service activities	18.3	15.57	1.18
Other services	25.2	14.6	1.73
Education, Human health and social work activities	8.38	31.07	0.27

Source: Authors' elaboration

Bibliography

- Acker J. (1990), Hierarchies, jobs, bodies: A theory of gendered organizations, *Gender & society*, 4, n.2, pp.139-158
- Albanesi S., Kim J. (2021a), Effects of the covid-19 recession on the us labor market: Occupation, family, and gender, *Journal of Economic Perspectives*, 35, n.3, pp.3-24
- Albanesi S., Kim J. (2021b), *The gendered impact of the covid-19 recession on the us labor market. Technical report*, Cambridge (MA), National Bureau of Economic Research
- Alon T., Coskun S., Doepke M., Koll D., Tertilt M. (2021), *From mancession to shecession: Women's employment in regular and pandemic recessions. Technical report*, Cambridge (MA), National Bureau of Economic Research
- Altonji J.G., Blank R.M. (1999), Race and gender in the labor market, *Handbook of labor economics*, 3, pp.3143-3259
- Baldini M., Torricelli C., Brancati M.C.U. (2018), Family ties: Labor supply responses to cope with a household employment shock, *Review of Economics of the Household*, 16, pp.809-832
- Baxter M., King R.G. (1999), Measuring business cycles: approximate band-pass filters for economic time series, *Review of economics and statistics*, 81, n.4, pp.575-593
- Betti E. (2016), Gender and precarious labor in a historical perspective: Italian women and precarious work between fordism and post-fordism, *International Labor and Working-Class History*, 89, pp.64-83
- Birkelund G.E., Lancee B., Larsen E.N., Polavieja J.G., Radl J., Yemane R. (2022), Gender discrimination in hiring: evidence from a cross-national harmonised field experiment, *European Sociological Review*, 38, n.3, pp.337-354
- Biroli P., Bosworth S., Della Giusta M., Di Girolamo A., Jaworska S., Vollen J. (2021), Family life in lockdown, *Frontiers in psychology*, 12 <<https://doi.org/10.3389/fpsyg.2021.687570>>
- Blau F.D., Kahn L.M. (1997), Swimming upstream: Trends in the gender wage differential in the 1980s, *Journal of Labor Economics*, 15, n.1, part 1, pp.1-42
- Blau F.D., Simpson P., Anderson D. (1998), Continuing progress? trends in occupational segregation in the united states over the 1970s and 1980s, *Feminist economics*, 4, n.3, pp.29-71
- Bredtmann J., Otten S., Rulff C. (2018), Husband's unemployment and wife's labor supply: the added worker effect across Europe, *Ilr Review*, 71, n.5, pp.1201-1231
- Buckingham S., Fiadzo C., Dalla Pozza V., Todaro L., Dupont C., Hadjivassiliou K. (2021), *Precarious work from a gender and intersectionality perspective, and ways to combat it*, Brussels, European Union
- Cetrulo A., Guarascio D., Virgillito M.E. (2022), Working from home and the explosion of enduring divides: Income, employment and safety risks, *Economia Politica*, 39, pp.345-402

- Cetrulo A., Sbardella A., Virgillito M.E. (2023), Vanishing social classes? facts and figures of the Italian labour market, *Journal of Evolutionary Economics*, 33, n.1, pp.97-148
- Chatzidakis A., Hakim J., Litter J., Rottenberg C. (2020), *The care manifesto. The politics of interdependence*, New York, Verso Books
- Christiano L.J., Fitzgerald T.J. (2003), The band pass filter, *International economic review*, 44, n.2, pp.435-465
- Claessens S., Kose M.A., Terrones M.E. (2009), What happens during recessions, crunches and busts?, *Economic Policy*, 24, n.60, pp.653-700
- Costa D.L. (2000), From mill town to board room: The rise of women's paid labor, *Journal of Economic Perspectives*, 14, n.4, pp.101-122
- Cresti L., Virgillito M.E. (2022), *Strategic sectors and essential jobs: a new taxonomy based on employment multipliers*, LEM Working Paper Series, Pisa, Scuola Superiore Sant'Anna
- Del Boca D., Oggero N., Profeta P., Rossi M.C. (2021), Household division of labor during two waves of covid-19 in Italy, *Covid Economics*, 75, pp.60-80
- Del Boca D., Oggero N., Profeta P., Rossi M. (2020), Women's and men's work, housework and childcare, before and during covid-19, *Review of Economics of the Household*, 18, n.4, pp.1001-1017
- Djankov S., Trubmic T., Zhang E. (2020), The gender gap and covid-19: Evidence from eight advanced economies, *VoxEU.org*, December 14th
- Dolado J.J., Felgueroso F., Jimeno J.F. (2002), *Recent trends in occupational segregation by gender: a look across the Atlantic*, IZA Discussion Paper n.524, Bonn, IZA
- Dosi G., Pereira M.C., Roventini A., Virgillito M.E. (2018), Causes and consequences of hysteresis: aggregate demand, productivity, and employment, *Industrial and Corporate Change*, 27, n.6, pp.1015-1044
- Fabrizio M.S., Gomes D.B., Tavares M.M.M. (2021), *Covid-19 she-cession: The employment penalty of taking care of young children*, IMF Working Paper n.58, Washington (DC), International Monetary Fund
- Fazzari S.M., Needler E. (2021), US employment inequality in the great recession and the covid-19 pandemic, *European Journal of Economics and Economic Policies: Intervention*, 18, n.2, pp.223-239
- Fitzgerald T.J., Christiano L.J. (1999), *The band pass filter*, Cambridge (MA), National Bureau of Economic Research
- Folbre N. (2021a), *The Rise and Decline of Patriarchal Systems: An Intersectional Political Economy*, New York, Verso Books
- Folbre N. (2021b), Gender inequality and bargaining in the U.S. labor market Why care work is undervalued, *www.epi.org*, March 10th
- Franceschi F. (2014), The Added Worker Effect for Married Women in Italy, in *Gli effetti della crisi sul potenziale produttivo e sulla spesa delle famiglie in Italia*, Workshops and Conferences n.18, Roma, Banca d'Italia, pp.214-245
- Ghignoni E., Verashchagina A. (2016), Added worker effect during the Great Recession: evidence from Italy, *International Journal of Manpower*, 37, n.8, pp.1264-1285
- Goldin C. (2006), The quiet revolution that transformed women's employment, education, and family, *American economic review*, 96, n.2, pp.1-21
- Goldin C. (1984), The historical evolution of female earnings functions and occupations, *Explorations in Economic History*, 21, n.1, pp.1-27
- Gonzalez M.J., Cortina C., Rodriguez J. (2019), The role of gender stereotypes in hiring: a field experiment, *European Sociological Review*, 35, n.2, pp.187-204
- Hodrick R.J., Prescott E.C. (1997), Postwar US business cycles: an empirical investigation, *Journal of Money, credit, and Banking*, 29, n.1, pp.1-16
- Hoynes H., Miller D.L., Schaller J. (2012), Who suffers during recessions?, *Journal of Economic perspectives*, 26, n.3, pp.27-48
- Hupkau C., Petrongolo B. (2020), Work, care and gender during the covid-19 crisis, *Fiscal studies*, 41, n.3, pp.623-651
- Kim A.T., Erickson M., Zhang Y., Kim C. (2022), Who is the "she" in the pandemic "she-cession"? Variation in COVID-19 labor market outcomes by gender and family status, *Population Research and Policy Review*, 41, n.3, pp.1325-1358
- Kleven H., Landais C., Posch J., Steinhauer A., Zweimüller J. (2019), Child penalties across countries. Evidence and explanations, *AEA Papers and Proceedings*, 109, pp.122-26
- Lundberg S. (1985), The added worker effect, *Journal of Labor Economics*, 3, n.1, Part 1, pp.11-3
- Manicardi C. (2023), Feminization of labor in Italy. A preliminary assessment, *Sinappsi*, XIII, n.2, pp.8-24

- Mc Lanahan S.S., Sørensen A., Watson D. (1989), Sex differences in poverty, 1950-1980, *Signs, Journal of Women in Culture and Society*, 15, n.1, pp.102-122
- Mincer J., Polachek S. (1974), Family investments in human capital: Earnings of women, *Journal of political Economy*, 82, n.2, Part 2, pp.S76-S108
- Muñoz L.G., Rodríguez-Modroño P., Addabbo T. (2015), Gender differences in labor force participation rates in Spain and Italy under the Great Recession, *Revista de economía mundial*, n.41, pp.21-42
- O'Neill J., Polachek S. (1993), Why the gender gap in wages narrowed in the 1980s, *Journal of Labor economics*, 11, n.1, Part 1, pp.205-228
- Pearce D. (1978), The Feminization of Poverty: Women, Work and Welfare, *Urban and Social Change Review*, 11, February, pp.28-36
- Peterson J. (1987), The feminization of poverty, *Journal of economic issues*, 21, n.1, pp.329-337
- Petrongolo B. (2004), Gender segregation in employment contracts, *Journal of the European Economic Association*, 2, n.2-3, pp.331-345
- Prieto-Rodríguez J., Rodríguez-Gutiérrez C. (2003), Participation of married women in the European labor markets and the “added worker effect”, *The Journal of Socio-Economics*, 32, n.4, pp.429-446
- Rubery J., Rafferty A. (2013), Women and recession revisited, *Work, employment and society*, 27, n.3, pp.414-432
- Rubery J. (2015), Change at work: feminisation, flexibilisation, fragmentation and financialization, *Employee Relations*, 37, n.6, pp.633-644
- Shibata M.I. (2020), *The Distributional Impact of Recessions: The Global Financial Crisis and the Pandemic Recession*, Washington (DC), International Monetary Fund
- Sun C., Russell L. (2021), The impact of covid-19 childcare closures and women's labour supply, *VoxEU.org*, January 22th
- Wellington A.J. (1993), Changes in the male/female wage gap, 1976-85, *Journal of Human resources*, 28, n.2, pp.383-411

Linnea Nelli

linnea.nelli@unicatt.it

PhD student in Innovation studies at the Department of Political Economy of the Catholic University of Sacred Heart in Milan. She graduated in Economics at the University of Pisa and School of Advanced Studies Sant'Anna. She has been part of a research group within the Recovery Watch project of the Foundation of European Progressive Studies. She is part of the research group of the Sant'Anna School of Advanced Studies for the project BARMETAL: Digitalization, Automatization and Decarbonization: Opportunity for strengthening collective bargaining in the metal sector.

Maria Enrica Virgillito

mariaenrica.virgillito@santannapisa.it

Associate Professor in Economics at the Institute of Economics, Sant'Anna School of Advanced Studies since 2022. She is a research fellow at the Catholic University of the Sacred Heart in Milan, Department of Economic Policy. She is a Global Labour Organization Fellow, serves as Editor for Industrial and Corporate Change, Associate Editor for Structural Change and Economic Dynamics, Review of Evolutionary Political Economy, and member of the Editorial Board of Sinapsi. Her publications have been hosted in a number of international scientific peer-reviewed journals in the realms of complexity economics, institutional labour economics, and evolutionary economics.