BANCA D'ITALIA
EUROSISTEMA

Women, labour markets and economic growth

Appendix: Summary of the papers in the research project

Seminari e convegni
Workshops and Conferences

number 26

June 2023

BANCA D'ITALIA
EUROSISTEMA

Women, labour markets and economic growth

Appendix: Summary of the papers in the research project

Seminari e convegni
Workshops and Conferences

Questa pubblicazione raccoglie i risultati di un progetto a cui hanno contribuito ricercatori del Dipartimento Economia e statistica e della rete territoriale della Banca d'Italia.

Il testo è disponibile nel sito internet: www.bancaditalia.it

ISSN 2281-4337 (print)
ISSN 2281-4345 (online)

Stampa a cura della Divisione Editoria e stampa della Banca d'Italia

Contents

One Cohort at a Time: New Perspective on the Declining Gender Pay Gap

Jaime Arellano-Bover (Tor Vergata University of Rome, EIEF, and IZA), Nicola Bianchi (Northwestern University and NBER), Salvatore Lattanzio (Bank of Italy), Matteo Paradisi (EIEF)

JEL Code: J16, J31, J11.
Keywords: gender wage gap, wage growth, age wage gap, older workers, labour-market entry, initial conditions.

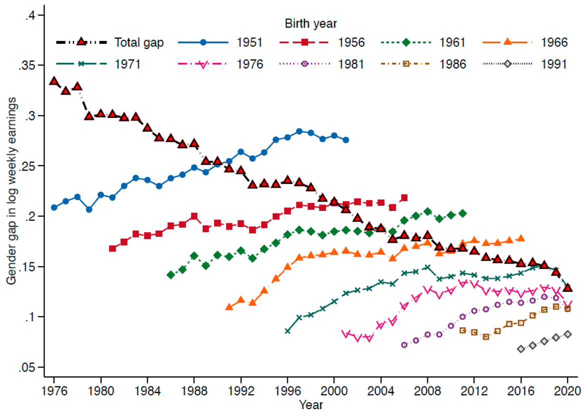
Forthcoming *Bank of Italy Working Papers*

Research question. – This paper provides new insights on the decline of the gender pay gap from the 1970s until today, using data from Italy and the US. There are two main ways in which the gap in average wages of men and women could have narrowed. First, there might be a market-wide gender convergence that affected all cohorts of workers, impacting both new entrants and incumbents (within-cohort effect). Second, newer cohorts may have entered the labour market with lower pay gaps, replacing older cohorts with greater gaps (between-cohort effect). The goal of this paper is to quantify these channels. To this end, it uses administrative matched employer-employee data for Italy and the Current Population Survey for the US.

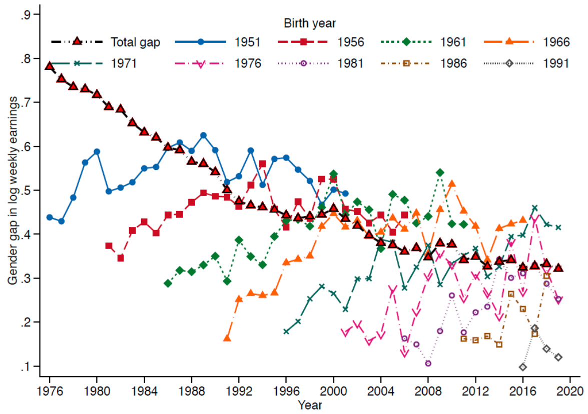
Results. – The paper proceeds in four steps. First, it describes how the gender pay gap has narrowed in both Italy and in the US over the last four decades, with the decline stemming from reductions happening mostly across cohorts. In both Italy and the US, the aggregate decline in the gender pay gap mainly stems from lower pay gaps for more recent cohorts, suggesting that the gender convergence in pay is not affecting all cohorts simultaneously (Figure 1). Moreover, the analysis shows that the gap at entry in the labour market decreased across cohorts until the 2000s, meaning that younger cohorts started from lower levels of gender pay gaps compared to older ones. Therefore, the intergenerational turnover favours the decreasing trend in the overall gap.

Figure 1. Gender gap between and within cohorts

a) Italy



b) US



Note: Panel a (Panel b) shows the trend in the mean gender pay gap across different birth cohorts in Italy (the United States). The red triangles depict the trend in the mean gender pay gap across all cohorts active in the labour market in each year. This analysis includes only workers aged 50 or younger to limit the influence of cross-cohort changes in the selection into retirement. Sources: In each year, the data pools information about all workers aged 25-50, employed in the private sector for at least 27 weeks year, earned strictly positive earnings, and did not retire. Sources for Italy: UNIEMENS, Istituto Nazionale della Previdenza Sociale (INPS). Sources for the United States. Integrated Public Use Microdata Series, Current Population Survey: Version 10.0 [dataset]. Minneapolis, MN: IPUMS.

Second, the analysis focuses on the cross-cohort dimension; it quantifies how much of the decreasing gender pay gap over time stems from cross-cohort convergence between genders. Specifically, it decomposes the aggregate gender pay gap into between-cohort and within-cohort components. The former capture how the overall gap would have evolved if there had been no change in the life-cycle wage growth across cohorts and genders. Hence, it measures the effect of a pure compositional change in the age demographics of men and women. In both countries the entire trend in the gender gap in weekly earnings can be accounted for by a progressive decrease in the between-cohort component, i.e., in the entry gap across cohorts. Therefore, the analysis reveals that the secular trend in the gender pay gap comes from younger cohorts with smaller pay gaps replacing older ones with large gaps. However, since the convergence in entry gaps has stalled during the 21st century, the paper shows that the exit of older cohorts has nowadays become the most important driver of the declining overall gap. Subsequently, in the absence of any structural breaks, a projection exercise predicting the timing of the closure of the overall gap results in a never-convergence result.

Third, for the Italian case, the paper investigates the potential role of sectors and firms in determining the cross-cohort convergence in the gender pay gap documented above. The analysis reveals that sectors only marginally contribute to the shrinking wage gap. In contrast, better sorting across firms explains a larger portion of such decrease.

Finally, the study investigates whether the 1970s–2000 decline in the entry-pay gap was due to improved prospects for young women or, instead, worse conditions for young men. Answering this question requires moving beyond the entry male-female gap itself and, instead, comparing young women and young men to a common benchmark. To this end, it compares how young men and women aged 25–29 have ranked, over time, in the pay distribution of (white) men older than 55. In Italy and in the US, the narrowing of the entry gap until the 2000s was mostly driven by younger men doing worse in absolute terms, rather than by younger women experiencing disproportionately meaningful improvements.

These findings imply that, both in Italy and US, pay convergence has manifested itself one cohort at a time; initially spurred by a decline in entry-pay gaps but, during the past two decades, merely driven by the outflow of older cohorts featuring greater gaps. Even more pessimistically, the original catalysts of these dynamics – male-female convergence in entry outcomes until the 2000s – were not driven by improved prospects for young women but, rather, by disproportionately worsening outcomes for young men. This interpretation leads to a cautionary note against interpreting narrowing gaps as undoubted gains for the less-privileged group.

BOARD COMPOSITION AND PERFORMANCE OF STATE-OWNED ENTERPRISES: QUASI EXPERIMENTAL EVIDENCE

Audinga Baltrunaite (Bank of Italy), Mario Cannella (Bank of Italy),
Sauro Mocetti (Bank of Italy) and Giacomo Roma (Bank of Italy)

JEL Code: G34, L32, H42.
Keywords: governance, state-owned enterprises, board composition, gender quotas.

The Journal of Law, Economics, and Organization, 2023

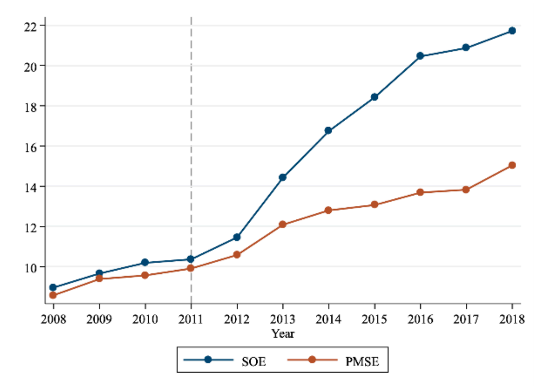
Research question. – The quality of governance crucially affects corporate outcomes, and may be particularly important for state-owned enterprises (SOEs), not disciplined by competition forces. This paper analyses the impact of board composition on the performance of companies controlled by public entities in Italy by exploiting a reform aimed at reducing female underrepresentation and the revolving-door phenomenon, i.e. the movement of high-level employees from public-sector to private-sector jobs and vice versa. In particular, the reform introduced gender quotas and legal limits to the appointment of former politicians to the boards. These measures are very relevant in the Italian context, where in the boards of directors of both private and, to a greater extent, public companies, women are historically under-represented, whereas former politicians are often appointed as directors even without specific expertise. This raises issues of both equity and efficiency.

Results. – The reform was successful in increasing female presence on boards of directors and in reducing the presence of directors with former experience in politics (Figure 1). This change was also associated with a rejuvenation of boards of directors and, above all, an increase in the 'quality' of directors; both the entry of more capable women (thus breaking the 'glass ceiling') and, to a greater extent, an improvement in selection mechanisms among men contributed to this increase.

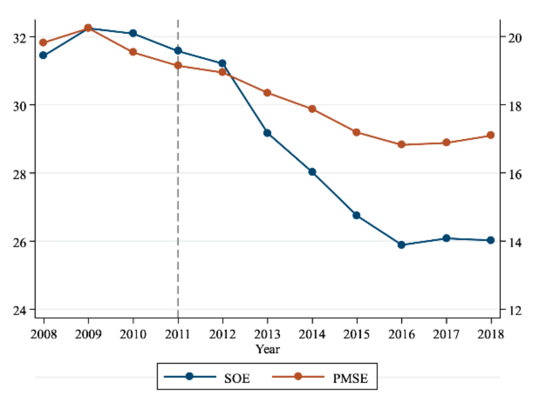
While the paper detects no changes on firm productive efficiency, there is evidence that firm profitability and other financial indicators improved. Moreover, for companies operating in the local public services sector, the paper finds an increase in citizens' satisfaction with the quality of services offered and in some objective measures of quality.

Figure 1. Board composition: directors' gender and past political experience

a) share of women



b) share of former politicians



Note: Figure plots unconditional averages of the percentage of female directors (panel a) and of directors with former political experience (panel b) on boards of state-owned enterprises (SOE) and of enterprises with a stock held by the public sector below 50% (PMSE). The share of former politicians in SOEs (PMSEs) is depicted on the left (right) axis.

Women in economics: the role of gendered references at entry in the profession

Audinga Baltrunaite (Bank of Italy), Alessandra Casarico (Bocconi University) and Lucia Rizzica (Bank of Italy)

JEL Code: I23, J16, J44.
Keywords: gender bias, research institutions, professional labour markets.

CEPR Discussion Paper 17474, CEPR, July 2022

Research question. – This paper proposes an analysis of gender differences in access to academic and research careers in the field of Economics and Finance.

To this end, we built a novel database containing information provided by all job market candidates for positions announced by two top Italian institutions hiring on the international junior academic job market over the past ten years. We collected approximately 8,000 applications.

The paper thus *(i)* examines gender differences in the applications, with a particular focus on the content of the reference letters provided for each candidate (approximately 20,000 letters, 2 to 5 per candidate); *(ii)* analyses whether and how gender differences in reference letters translate into diverging career paths for female and male researchers, once the main characteristics of the candidate, those of her sponsors and of the application submitted are accounted for.

Results. – We find that women represent less than a third of the candidates and about 15 percent of letter writers. These proportions have not increased over the last decade. Male and female candidates are different along several dimensions: on average, female candidates come from lower ranked universities, typically located in Europe, and are concentrated in the field of applied microeconomics relative to macroeconomics and finance. Also their applications are different: those submitted by female candidates are generally accompanied by a lower number of reference letters and such letters are more often written by female sponsors, who typically hold more junior positions in academia.

We thus proceed with a text analysis of the reference letters by means of the most recent Natural Language Processing techniques (specifically, Word Embeddings). This analysis reveals significant gender differences in the way candidates are described by their sponsors. In particular, using a semantic classification introduced in the applied psychology literature, we show that women tend to be described more often with terms that refer to the "grindstone" sphere, that is being diligent and hardworking, and less to the “standout” sphere, that is being brilliant and outstanding. These differences persist also controlling for several candidate’s characteristics that are meant to proxy for unobserved ability. Moreover, they are driven by male sponsors, while women do not use systematically different terms depending on the gender of the candidate.

We then use information on candidates' early career outcomes obtained through web-scraping of the main online archives (Linkedin, Repec, Google Scholar). Then, in a regression framework we study gender differences in early career achievements - like seniority in the position and prestige of the institution of first and current placement. We find that the use of standout (grindstone) terms is positively (negatively) correlated with measures of career success, even controlling for proxies of candidate’s quality.

Implications. – Our analysis reveals that gender biases in the way male and female economists are perceived and described by senior academics do exist and relate to gender differences in career progressions of young researchers. Our findings thus highlight a potential structural flaw in the academic job market process and, more generally, in all those hiring and promotion schemes that heavily rely on reference letters, especially in environments characterized by a strong male prevalence. By putting female candidates in a weaker position to compete, such schemes negatively affect women's career progression. Awareness-raising campaigns, guidelines on what language to use in recommendation letters, use of open text vs specific areas of comment are some examples of potential areas of change, with the goal of securing an inclusive profession.

Female labour force participation and fertility in Italian history

Federico Barbiellini Amidei (Bank of Italy), Sabrina di Addario (Bank of Italy), Matteo Gomellini (Bank of Italy) and Paolo Piselli (Bank of Italy)

JEL Code: J11, J13, N30.
Keywords: Fertility, Female labour participation, Economic history.

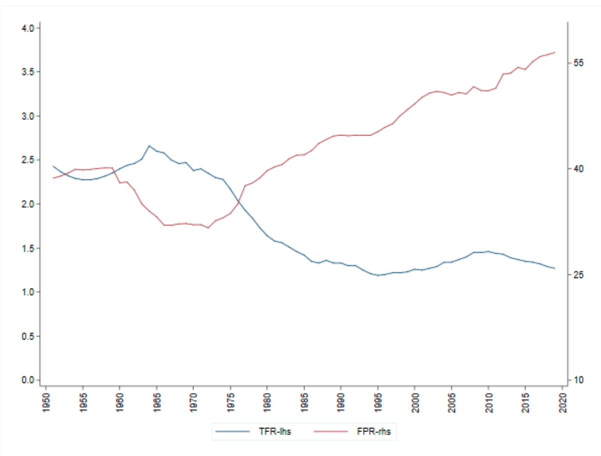
Research question. – This paper investigates the relationship between fertility dynamics and female labour force participation in Italy after WWII. By integrating extant statistics with Census data and new reconstructions at the regional level, we first provide stylized facts about the relationship between female participation and fertility, also in international comparison. Second, we perform an econometric analysis of the long-run relationship between female participation rates (FPR) and Total Fertility rates (TFR) at the regional level for the period 1959-2019 using cointegration techniques that take into account relevant socio-economic variables.

The estimation of the impact of fertility on female participation is typically affected by reverse causality and relevant omitted variable bias. To complement the regional cointegration analysis and identify the causal effect of having children on mothers' participation to the labor market, we run individual-level estimates using the Bank of Italy's Survey of Household Income and Wealth (SHIW) micro-data for the period 1989-2016. The identification of the causal effect relies both on a natural experiment and on the use of an instrumental variable strategy based on a wide set of instruments (i.e. twins at first birth, twins at second birth and sex composition of children).

Results. – First, descriptive aggregate data show that while FPR increased steadily from the early Seventies, TFR has been declining between the mid-Sixties and the mid-1990s, when it reached a minimum, after which it grew slightly for a few years to resume a still-ongoing decreasing trend thereafter (Fig. 1). Differently from the FPR, the Total Fertility Rate nation-wide pattern after 1980s becomes quite heterogeneous across regions: it steadily increases in the Center-North and is rather flat in the South.

Second, a panel-cointegration analysis at the regional level – controlling for economic growth, shifts in sectoral composition and female education – provide us with a negative and significant correlation between FPR and TFR over the period 1959-2019, although after 1995 the correlation is not statistically significant. This result is mostly driven by the least educated women, who are probably the poorest, as education positively correlates with income.

Figure 1. Female participation rates (FPR) and Total Fertility rates (TFR) in Italy (1951- 2019)



Note: The figure shows the evolution of TFR (births per women in childbearing age) and FPR (the share of active women over the 15-64 female population). Source: Authors' calculations based on Istat data.

Third, when we use the SHIW data to exploit individual-level variation in fertility, we find that after controlling for individual characteristics the probability of participating in the labour market and the number of children are negatively correlated both for the full sample of women and for the sub-sample of mothers (OLS estimates). The negative sign is confirmed also by the causal estimates, which show that passing from one to two children significantly reduces women's likelihood to work, while passing from two to three or more children has a non-significant effect (Table 1).

Table 1. Probability of participating to the labour market for mothers aged 18–55. OLS / IV estimates (1989-2016)

Explanatory Variable / Instrument	OLS	2SLS	OLS	2SLS
More than one child	−0.079***			
Instrument:				
multiple first birth		−0.216**		
More than two children			−0.108***	
Instrument:				
multiple second birth				−0.049
same sex				−0.079
two boys				−0.088
two girls				−0.068
all instruments togheter				−0.054
Obs.	14,662	14,662	9,442	9,442

Note: All the regressions are standard error-adjusted for within-province correlation. Variables denoted with * (**) [***] indicate statistical significance at the 10 (5) [1] percent level.

Finally, when testing the influence of household's income on the female participation–fertility relationship, we find that the trade-off is driven by the women whose income is below the median.

Our findings suggest that policies aiming at reconciling motherhood and work could fruitfully target the provision of free child-care services and/or financial aid for low-income female workers.

SELF-EMPLOYMENT, ENTREPRENEURSHIP, GENDER AND FERTILITY

Francesco Billari (Bocconi University), Berkay Özcan (London School of Economics) and Concetta Rondinelli (Bank of Italy)

JEL Code: D10, J13, J16.
Keywords: Workplace flexibility, Occupational choice, Family Business, Low fertility.

Forthcoming *Bank of Italy Working Papers*

Research question. – Employment type is a key factor in shaping the opportunity and cost of balancing work and family. In this paper we address the following research questions. Do self-employed Italians have more children than similar wage-employees? Does this relation differ by self-employment types? Is this relationship causal? What mechanisms explain the relationship between self-employment and the number of children for men and women? It is important to examine the relationship between fertility and different types of self-employment, as for example, both fertility and entrepreneurship respond to specific labor market policies (i.e. unemployment benefits, basic income schemes) and are considered important policy targets for governments aiming to increase both. Italy is a central case study, as self-employment rates are exceptionally high compared to other advanced economies and the fertility rate is one of the lowest in the world.

Data. – We use data from the Italian Survey on Household Income and Wealth (Bank of Italy) for the period 1995-2014. The richness of the database, unique in the international scene, allows us to distinguish three groups of self-employed (both for men and women): laborer (solo) self-employed (*laborer SE),* entrepreneurs, and self-employed professionals (*professional SE*). The SHIW also provides high quality measures of fertility: number of children ever born to an individual and fertility intentions. Additionally, information on parental self-employment, the number of siblings of the respondents and their partners, enable studying intergenerational links.

Results. – We find no support for the conceptualization of self-employment as an insecure, unstable form of employment that discourages having children among Italian men. On the contrary, all self-employed men have higher fertility than employees. We also confirm that self-employment causes men to have more children, as demonstrated by various identification strategies. In other words, they have more children not because they choose self-employment to increase their earning capacity or control work schedules after becoming fathers. Rather, being self-employed appears to be a direct factor in their decision to have more children. One reason behind this fact could be that having (more) children increases the likelihood of one eventually taking over the business (i.e. father passing the crown) after working as an unpaid employee.

Concerning women, our findings differ from previous studies on the U.S., where the choice of being self-employed has been linked with children, births, and demand for flexibility. In the first instance, using naïve OLS estimations with fixed effects, we show a positive and statistically significant association between laborer SE and a higher number of children, driven by women under 45 (within the fertility window). This suggests that the explanations related to the demand for flexibility around childbirth might be plausible for Italian women, too. Moreover, the association disappears after most women complete their fertility, which is arguably, the period when women's demand for flexibility should be lower.

However, an explanation based on flexibility and work-life balance is less convincing in Italy because these women work an additional 8 hours per week on average than a typical employee. Thus, we conduct several further analyses and conclude that the transition to self-employment due to children and the demand for flexibility around childbirth does not explain why laborer SE women have more children in Italy.

Implications. – The results of this study imply that labor market policies that provide incentives to entrepreneurship or protection or benefits for self-employment may also have unintended effects on family size and fertility in a low fertility country like Italy. Should the share of self-employed be lower, Italy would probably suffer from an even lower level of fertility. Thus, treating self-employment only as an insecure and precarious form of employment may miss an essential role of this employment type for family formation.

THE SHORT AND MEDIUM TERM EFFECTS OF FULL-DAY SCHOOLING ON LEARNING AND MATERNAL LABOUR SUPPLY

Giulia Bovini (Bank of Italy), Niccolò Cattadori (University of Zurich), Marta De Philippis (Bank of Italy) and Paolo Sestito (Bank of Italy)

JEL Code: J13, J16, J24
Keywords: Full-day schooling, students' achievement, mothers' labour supply

Forthcoming *Bank of Italy Working Papers*

Research question. – This paper studies the short- and medium-term effects of full-day schooling on students' achievement and their mothers' labour supply. The setting is Italy, where full-time (FT) and part-time (PT) daily schedules coexist in primary schools. Students in the FT schedule spend 40 hours per week at school: 8 hours a day, Monday to Friday. Pupils on the PT schedule typically spend a 27-30 hours per week at school, mostly in the mornings. While the curriculum is the same under the two schemes, students in the FT programme have lunch and revise the curriculum at school, under their teachers' supervision.

The analysis focuses on the cohort of pupils who started primary school in 2014-15 and follows them from when they apply to primary school to the final year (grade 5) and up to the last year of lower secondary school (grade 8): this is made possible by a unique match between application-to-primary-school data and longitudinal standardized achievement data.

Results. – We first document that in both programmes students devote a similar amount of time to educational activities: there is a close to 1:1 substitution between homework at home (PT scheme) and in-class revision (FT scheme). There is also no significant difference in leisure time. Teachers in the FT scheme are younger and more educated, but there are no sizable differences in teaching practices or methodologies between the two schemes.

We then discuss how the allocation to either scheme reflects selection both from the demand side – as parents can express a preference for the scheme they want their child to attend – and the supply side – as infrastructure, resources and institutional constraints sometimes lead to excess demand for either scheme, so that the school principals decide whom to accommodate. Supply-side constraints are especially binding for the provision of the FT scheme, which is costlier to provide: only 84 out of 100 FT applicants get a spot.

To tackle these layers of selection, we make use of application data: conditional on parental preferences, proxied by individual applications, we exploit variation in the probability of attending the FT scheme that only stems from the mix of FT and PT applications received by the school and from class size limits set by the law.

We show that attending the FT scheme increases Math test scores in grades 2 and 5 by around 4.5% of a standard deviation, but the effect fades away by grade 8. The effect on Italian test scores is only statistically significant in grade 2. Conversely, we find a positive effect on maternal labor force participation and employment, which is long-lasting (approximately 2 p.p.). No effect is found on fathers' employment. Our results are robust to a series of robustness checks. Finally, we show that effects seem to be larger for disadvantaged students and less-educated mothers.

The Origins of the Gender Pay Gap: the Role of School-to-Work Transition

Giulia Bovini (Bank of Italy), Marta De Philippis (Bank of Italy) and Lucia Rizzica (Bank of Italy)

JEL Code: J24, J31, J45, J62, J82.
Keywords: gender pay gap, field of study, tertiary and upper secondary education, sorting.

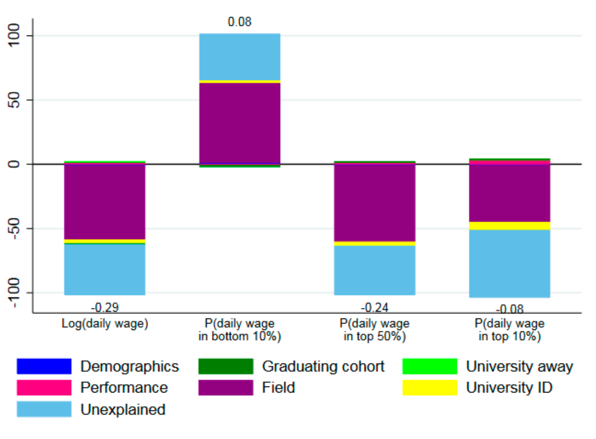
Forthcoming *Bank of Italy Working Papers*

Research question. – A significant gap in both employment probability and earnings already appears at the very early stages of the career. This paper investigates its determinants focusing on field of study choices (school track choices and university major) on the one hand, and on differences across employers on the other hand. A growing body of research, indeed, shows that differences in the field of study and in firm-specific characteristics account for a large share of the gender pay gap. Our analysis leverages on a novel unique administrative dataset containing information on six cohorts of Italian high school and university graduates. The data combine granular information on school and university curricula with detailed early labour market outcomes.

Methodology. – We apply a two-step procedure to account for the sequential nature of the educational choices first, and employment decisions later. In the first step we perform an Oaxaca Blinder decomposition of the *overall* gender pay gap observed one and five years after completing education to assess the role of differences in fields of study and other education outcomes. In the second step, we provide a decomposition of the gap but observed *within* each field of study, to shed light on the role of the characteristics of the job and the firm where boys and girls are employed after completing education. We finally combine the two steps to assess the overall explanatory power of our model.

Results. – We find that overall differences in educational controls (school performance, students' mobility, university identifiers and fields of study) explain on average 30 per cent of the early career gender wage gap among high school graduates and 60 per cent among university graduates. Among all educational controls, field of study is the characteristic that matters the most. Moreover, we find that educational choices explain less of the gap among top earners.

Figure 1. Gap in daily wage (F-M) 1 year after college graduation, private employees only



Source: MIM, MUR, MLPS, INPS and MEF. *Notes*: cohorts who graduated from upper secondary school or university (2nd level or one-cycle degree) in the period 2011-2018. Only graduates who work and no longer study. Overall difference normalized to 100, actual value displayed at the top of the bar.

There remain sizeable gender wage gaps – up to 30-45 per cent – even *within* narrowly defined fields. When decomposing within-field gaps, we find that firm characteristics explain a larger share of the gap among high school graduates than among university graduates (75 per cent vis-à-vis 60 per cent for the median field). The main determinants, in particular, are firm productivity (as proxied by firm age, size and VA per worker), the use of part-time contracts and the occupation. For university graduates, the characteristic that matters the most in explaining gender wage gaps is firm productivity.

We finally pool together our estimates in a regression based framework and find that overall educational choices and firm characteristics explain 75 per cent of the gender wage gap observed among high school graduates and 80 per cent of that observed among university graduates (Table 1).

Table 1. Combined effect of educational choices and job characteristics

Secondary School grad.			University grad.		
Raw (1)	Edu contr. (2)	Job contr. (3)	Raw (4)	Edu contr. (5)	Job contr. (6)
Average (log) daily wage					
-0.260***	-0.185***	-0.064***	-0.283***	-0.114***	-0.051***
(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
584,339	583,975	583,949	280,004	280,002	279,959
% of tot gap explained					
	28.8	46.5		59.7	22.3

Source: MIM, MUR, MLPS, INPS and MEF. *Notes*: cohorts who graduated from upper secondary school or university (2nd level or one-cycle degree) in the period 2011-2018. Only graduates who work and no longer study. Columns (1) and (4) display the raw gap; columns (2) and (5) control for demographics, background, as well as education choices, and academic achievement; columns (3) and (6) control also for job and employer attributes.

Implications. – The findings of this paper show that a significant gender wage gap appears already at the onset of the career. Especially for more educated workers, the main source of this gap is the choice of the field of study. Women, indeed, select into majors that are associated with lower returns on the labour market. Policy-wise this urges to focus action on educational choices: students' exposure to non-traditional role models (i.e., women working in male dominated fields, like engineering), targeted school orientation meetings and a general raise in the awareness of the weight of field of study choices can level the playing field and allow women not to start off on the labour market already on a disadvantage compared to their male peers.

WOMEN AND ECONOMIC OPPORTUNITIES: PERSPECTIVES FROM THE BANK OF ITALY'S REPRESENTATIVE OFFICES AND FINANCIAL ATTACHÉS ABROAD

Ines Buono (Bank of Italy), Flavia Corneli (Bank of Italy), and Angela Di Maria (Bank of Italy)

JEL Code: E24, J16, K3, L26.
Keywords: gender, female labour supply wage gap, glass ceiling.

Newsletter of the Bank of Italy's Representative Offices and Financial Attachés abroad, 2022

Research question. – This work collects and compares a set of contributions of the Bank of Italy's Representative Offices and Financial Attachés abroad that in early 2022 investigated the evolution of gender policies within each country they operate, their criticalities and implementations, as well as the debate on women's access to economic opportunities. Each report focused on five broad themes: a) labour force participation and labour conditions, b) wage gaps, c) representation in decision-making positions, d) entrepreneurial opportunities and e) access to education.

Labour force participation. – Notwithstanding increases in per-capita income Australia, Tunisia and India show worsening conditions with respect to female participation, whereas New Zealand and Taiwan are among the best countries in terms of gender gaps closure on all parameters. In South Korea and Singapore, demographic challenges have motivated efforts towards policy reforms increasing women's engagement in the labour market. Similarly, in Japan family-friendly policies have helped women entering labour force after pregnancy. Social roles as well as legal constraints discourage women's engagement in Egypt and Turkey and cultural norms can explain the low labor participation in the United Arab Emirates (UAE), despite their significant achievements in promoting gender equality.

Wage gaps. – With regard to wages, the gap between men and women is still high with the convergence process somehow slowing down in the last two decades (even in advanced countries like the United States). In other countries, such as Singapore and Japan, there is evidence of occupational segregation, with men being overrepresented in high-wage occupations. Since wage gap occurs also within same job and same occupation, many governments have introduced wage-reporting legislation to support transparency. The UAE has been the first country in the MENA region to adopt wage parity by law, albeit the legislation applies only to big companies and no enforcement measures are provided. Other governments (most notably the United States, the United Kingdom and France) decided to add or toughen obligations on companies with respect to pay transparency.

Representation in decision-making positions. – The debate worldwide is on the pros and cons of introducing quotas. Germany is lagging behind other developed countries in terms of gender representation in decision-making positions, despite the adoption of gender quotas for both the public and private sector. China, Brazil, Argentina and South Korea have introduced gender quotas to foster women's political representation, which is already high in Russia and South Africa even in the absence of any legal intervention. Turkey reports a high presence of women CEOs in large enterprises; this might partially result from the tendency of family-dominated companies to include young members in the board of directors.

Entrepreneurial opportunities. – The MENA region has the largest entrepreneurship gender gap. In Egypt, evidence also suggests that women resort to entrepreneurship by necessity rather than opportunity, given their limited access to payed jobs. Policies introduced to support women entrepreneurship include training, mentoring, empowerment, access to credit, with business association playing a leading role. The United Kingdom is on the other side of the spectrum, scoring highly in the international indexes of female entrepreneurship, thanks to a longstanding government effort. On the contrary, in Brazil there appears to be a perception among most government entities that special initiatives for women are unnecessary, if not discriminatory.

Access to education. – Most of the countries made substantial progress in gender parity in education. In France and the United Kingdom, girls outperform boys in high education attainment rate and, in the latter, since 2006 women have been more likely to enter higher education than men. However, a gender gap in the STEM (Science, Technology, Engineering and Mathematics) fields still exists and specific programs to increase the number of women in these areas and to fight stereotypes have been launched in several of the observed countries (e.g. Japan, Argentina, UAE, Germany, Russia, the United States, Brazil). In the MENA region and in India, a major fault line in the shaping of educational attainment is the one that separates urban and rural areas, as well as richer and poorer regions.

AN INTERNATIONAL MAP OF GENDER GAPS

Ines Buono (Bank of Italy) and Annalivia Polselli (University of Essex)

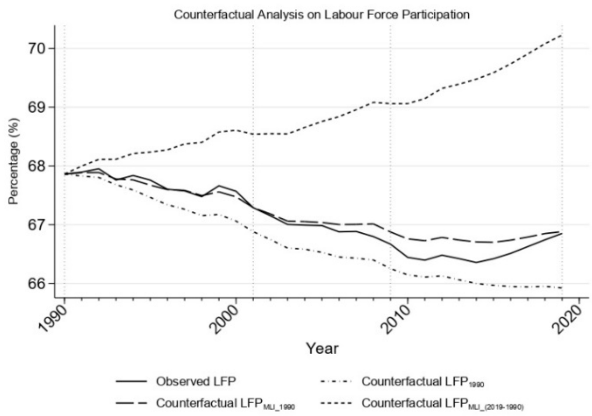
JEL Code: E24, J16, J21, J71, J78.
Keywords: gender gaps, labour force participation, female employment, Covid-19.

[Bank of Italy Occasional Paper 714, 2022]

Research question and motivation. – The paper revisits the main stylized facts on female labour force participation, employment and unemployment over the last thirty years. Using a unified and up-to-date dataset from official international sources (the World Bank Group, the International Labour Organization, and International Monetary Fund), we compare the ongoing trends and dynamics in High-Income (HI) economies with those of Middle-Low income (MLI) countries. The background picture in our data is that gender gaps in the labour market do exist and are, as expected, much higher in MLI countries than in HI countries. These disparities adversely affect women's contribution to measured economic activity, compressing overall growth and economic development Female labour force hence constitutes an untapped reserve of resources in an era of sluggish productivity and low potential output.

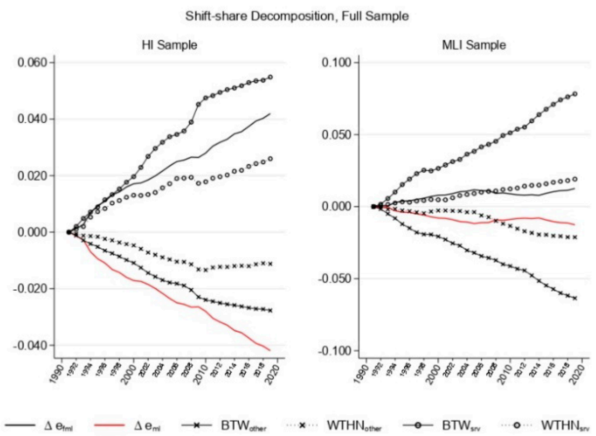
Results. – Our main results can be summarised in the following five points. (i) First, a decrease in female participation had a drastic impact on total labour supply. Our counterfactual exercise in Figure 1 showed that the decline in global labour supply not only could have been attenuated if female labour supply had remained constant at the levels of 1990, but almost reverted if female participation in MLI countries had grown as much as in HI countries over the period considered. (ii) Second, male unemployment is, as expected, more cyclical than female unemployment only in HI countries (this is also related to the sectoral allocation of male employment). Conversely, in MLI countries the trend is more relevant than the cycle, and male and female unemployment are almost completely aligned. Understanding the behaviour of male and female unemployment is essential to target policies to contrast adverse effects of crises based on their nature.

Figure 1. Counterfactual analysis, all counties



(iii) Third, the increase in the change of female employment is mainly driven by the expansion of the service sector, where women are mostly employed. The shift-share decomposition *within* and *between* sectors (agriculture, industry, services) of female and male employment in Figure 2 outlined the contribution of each component over time and, especially, during economic downturns. The change in female and male employment shares follows opposite directions (with same magnitudes). (iv) Fourth, looking at the long-term determinants of female labour force participation by means of a regression analysis, we find strong evidence in support of the U-shape hypothesis for female labour force participation. That is, women's participation in the labour market decreases at early stages of the economic development until when the relationship is reversed (Goldin, 1994). The institutional setting and policies contribute to foster women's participation in HI countries whereas the economic structure and the stage of development are crucial in MLI economies. This suggests that gender-oriented policies should be implemented in HI countries while GDP-oriented policies in MLI economies.

Figure 2. Shift-share decomposition, by income group



(v) Finally, we show that the Covid-19 outbreak magnified the existing regional disparities, and affected men and women differently. The Covid-19 crisis has brought about a strong and fast increase in unemployment, especially for women in HI countries, which has been quickly re-absorbed. The severe and unprecedented decrease in labour participation is still far from reverted if we consider the entire population aged over 16. This suggests that the Covid-19 crisis can potentially slow down or even revert the convergence in gender labour market that we have observed until 2019, at least in HI countries.

Female labour supply in Italy: the role of parental leave and child care policies

Francesca Carta (Bank of Italy)

JEL Code: H40, J13, J16, J22, K36.
Keywords: family law, child care, gender, female labour supply.

Economia Italiana, 2019

Research question. – Parental leave and childcare policies are the two main family-friendly programmes adopted in developed countries intended to provide parents with a satisfactory work-family balance. An important goal of these policies is to foster the labour supply of mothers, usually the primary caregivers in the family. Because extending parental leave or providing highly subsidised childcare entail large costs for public budgets, understanding their causal impact on female labour supply is crucial.

Moreover, these policies are also highly debated, not only because of their cost. Some scholars argue that long periods of leave may reduce mothers' labour market attachment and depreciate their human capital; they could increase employers' expected labour costs at the time of hiring women of childbearing age; formal childcare may be detrimental for children's development, especially if it replaces high-quality maternal care.

The aim of this paper is twofold. First, it illustrates the main characteristics of the Italian system of parental leave and childcare. Second, it revises the main empirical literature on the causal effects of parental leave and subsidized childcare on maternal labour supply and on the outcomes typically advocated as arguments against these policies (e.g., children's development). Finally, the paper outlines the main lines along which changes in the Italian system could encourage female labour supply.

Results. – The Italian parental leave system (consisting of maternity, paternity and parental – shareable between parents – leave) is significantly less generous relative to those in place in the Nordic countries, while it is similar to systems implemented in the other main European economies. With respect to the latter, however, the Italian programme is relatively less generous for fathers, and more generous for mothers. Italy has a particularly low level of childcare enrolment compared with both the OECD and EU averages. Italy spends relatively less on younger children than on older ones. In addition, there are large disparities in childcare provision between Italian regions, with Northern regions having enrolment rates in line with European levels.

The previous empirical literature has established the existence of a concave relationship between the length of parental leave and maternal labour market outcomes. Short parental leave improves maternal labour market outcomes (less than 1 year), while leave entitlements longer than 1 year seem to have adverse effects on mothers' wages and employment. Extensions of paternity leave seem to effectively trigger a rebalance of domestic chores between partners in countries characterised by low maternal labour supply. Moreover, providing childcare services to younger children (aged 0-2) has positive effects on maternal employment when the latter is low, there are few alternatives (both formal and informal) to maternal care, and the overall culture is favourable to childcare use and maternal labour supply.

The article concludes that there is scope to promote quality childcare support to further improve female labour supply in Italy. In addition, increasing the length of paternity leave could help to rebalance the domestic workload between genders and overcome stereotypes

MOTHERS' QUITS AT CHILDBIRTH AND FIRM LEVEL RESPONSES

Francesca Carta (Bank of Italy), Marta De Philippis (Bank of Italy), Alessandra Casarico (Bocconi University) and Salvatore Lattanzio (Bank of Italy)

JEL Code: J16, J23, J21, J38, J65.
Keywords: quits, hirings, separations, unemployment benefits, statistical discrimination, triple difference.

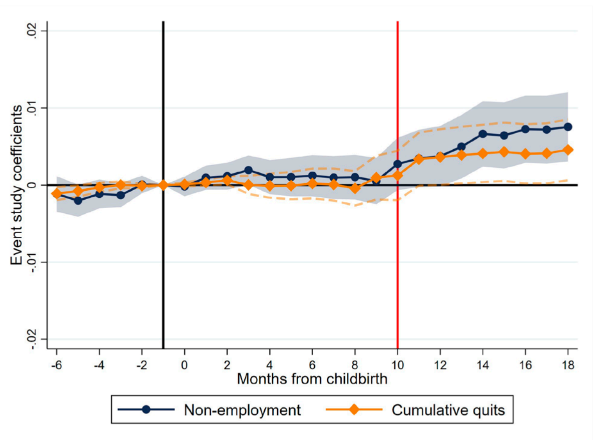
Forthcoming *Bank of Italy Working Papers*

Research question. – Sizeable child penalties – the gap in mothers' earnings that arises at childbirth relative to fathers or women without children – are long-lasting and observed in all countries. One of the main margins of the penalty is mothers' exit from employment at childbirth. This behaviour may affect firms' labour costs and employment decisions.

This paper investigates how firms respond to mothers' exit from the labour market at childbirth. To address this question, we exploit a policy that increased mothers' incentives to quit their job at childbirth. In Italy, mothers who voluntarily resign within the first 12 months from childbirth are entitled to receive the unemployment benefit (UB), the access to which is thus not limited to the case of dismissal. Law decree 22/2015 (i.e., the *Jobs Act*) increased the duration of the unemployment benefit from 8 months to up to 24 months, depending on the number of weeks worked before the job separation. The change in the duration of the benefit represents an exogenous change in mothers' expected utility of being unemployed. Leveraging on matched employer-employee data for the universe of employees working in the private non-farm sector, we estimate, in an event-study around childbirth. Specifically, we run a difference-in-differences model, which compares the outcomes of new mothers (or firms employing new mothers) with a more/less marked increase in the potential duration of UB, before and after the reform. We study the effects of the policy on maternal employment outcomes and on several firms' margins.

Results. – The paper finds that the longer duration of UB increases mothers' quit rate 10 months after childbirth, approximately the moment in which both the mandatory maternal and the voluntary parental leave expire. As a consequence, the non-employment probability increases being still higher 18 months after childbirth (Figure 1).

Figure 1. Quitting and non-employment probability of new mothers



Note: Each dot represents the change in the quitting/non-employment probability of new mothers having their child after the UB reform relative to the period before and exposed to a 100 days' increase in their potential UB duration, between the 6 months before until 18 months after childbirth. The 95 per cent confidence intervals are obtained from cluster-robust standard errors at the individual level. Other controls are included.

The effects are concentrated among mothers with permanent contracts, as the reform changed very little the incentives for workers with temporary contracts, who cannot voluntarily quit their jobs (unless in special cases justified by specific reasons) and are less likely to be eligible for the unemployment benefits when the contract expires. We do not detect any impact on layoffs, indicating that firms employing new mothers more exposed to the reform faced a higher turnover and were not simply replacing layoffs with voluntary quits. In response to the increased turnover of new mothers, we observe that in most affected firms (i.e., those that employ most affected mothers at the time of childbirth), the number of net hires among male workers goes up, while that among female workers does not change significantly. Effects are concentrated among young employees (less than 45 years old), who are more likely to be substitutes of new mothers because of their age proximity. Looking at the margins of adjustment separately, we find that more exposed firms increase hirings of young male workers, while they slightly reduce separations of young female workers (other than the new mother). This finding suggests that firms, when employing women, select those who already have some experience in the firm, i.e. those for whom asymmetric information is lower. This is because the policy increased the expected cost of parenthood for mothers but not for fathers, amplifying the importance of asymmetric information on the degree of labour market attachment when hiring women.

Implications. – Overall, the higher hiring rate of young men in response to the reform suggests that the policy, by increasing mothers' incentives to quit at childbirth, has created a penalty on the hirings of young women, worsening statistical discrimination against women at childbearing age. These women, then, are penalized when looking for a new job.

MINIMUM INCOME AND HOUSEHOLD LABOUR SUPPLY

Francesca Carta (Bank of Italy) and Fabrizio Colonna (Bank of Italy)

JEL Code: H31, I38, J21, J22, J31.
Keywords: labour supply, female labour force participation, labour earnings, transfers, tax-system.

Forthcoming *Bank of Italy Working Papers*

Research question. – This paper studies the effect of guaranteed minimum income (GMI) programmes on the incentives to work of partners. Under GMI schemes the unit eligible for the transfer is the household and the amount of the benefit depends on family income: individual monetary incentives to work will therefore depend on partner's income and employment. Such jointnesses in the tax-transfer function typically penalize the employment of second earners (married women).

We first theoretically study how GMI differentially affects the incentives to work of partners. For singles, where there are no partners' interactions, the GMI acts likewise an individual-based subsidy and discourages the labour supply of workers facing lower wage offers (again, more often women). In couples the GMI introduces strategic complementarities that are not present in traditional individual-based schemes. When one partner is non-employed or their wage is low enough to qualify the family for the subsidy, the other partner might find it convenient to remain inactive in order not to lose the benefit. Such disincentive to work disappears for partners of high-wage workers, whose income is already high enough to exclude them from the programme. Then, a GMI is expected to produce larger negative labour supply effects in economies where a lower employment rate of married women compresses the share of two-earners' households. We study these implications in the case of Italy, where the employment rate of married women is particularly low and a very generous GMI programme has been recently introduced (*reddito di cittadinanza*, RdC). We quantify the labour supply effects by means of a structural model calibrated to the Italian economy with data from the Survey on Income and Living Conditions (SILC).

Results. – First, we find that for singles, where there are no household interactions and mimicking individual-based transfers, the introduction of RdC reduces employment more among women than men (by 1.8 and 1.0 percentage points, respectively), since the former typically face lower wages.

Second, as for couples, we do not observe significant effects on married women, while the employment rate of married men reduces by 2.1 p.p. and the share of unemployed rises by 1.6. As predicted by the model, declines in male employment are concentrated on single earner households in the pre-RdC scenario: with RdC the share of couples where neither partner works rises by 2.1 p.p., mostly fuelled by a reduction in the share of households where only the husband works (-1.8); on the contrary, the share of households in which both partners work stays substantially unaltered. Husbands who quit employment are those living with wives who face a high costs of participation – mainly due to the presence of children and low wage offers, and do not work even in the absence of RdC.

Abstracting from equity considerations, our analysis suggests that there is a potential trade-off between family *versus* individual-based income support schemes. On the one hand, under a GMI scheme the labour supply of second earners is less discouraged than in the presence of an individual-based subsidy. On the other hand, a GMI scheme fosters low-wage partners to be non-employed, increasing the share of households in which both partners do not work and are dependent on income support programmes, boosting the risk of poverty traps.

Behind the child penalty: understanding what contributes to the labour market costs of motherhood

Alessandra Casarico (Bocconi University) and Salvatore Lattanzio (Bank of Italy)

JEL Code: J13, J16, J31.
Keywords: child penalty, motherhood, labour supply, heterogeneous effects, matched employer-employee data.

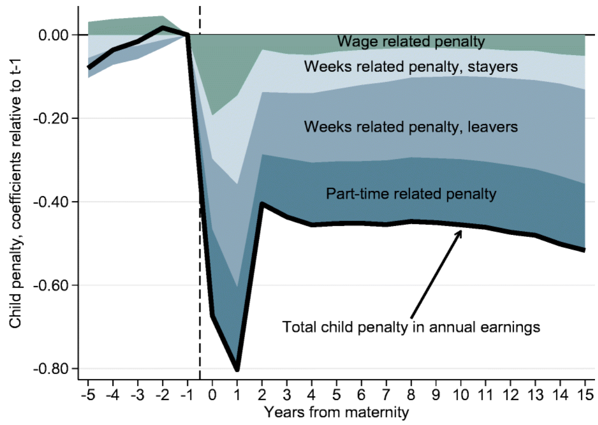
Journal of Population Economics, 2023

Research question. – This paper estimates the so called *child penalty* in earnings – the difference in yearly labour incomes between women with and without children – and explores the individual-level, firm-level, and cultural factors that influence its size. Using matched employer-employee administrative data for Italy over the period 1985-2018, it first provides evidence on the short- and long-run effects of having a child on labour market outcomes of employed mothers compared to employed non-mothers. Second, it studies sorting of women with and without children across different types of firms after childbirth. Third, it explores the heterogeneity in the level of the child penalty across individuals and firms.

Results. – This paper estimates that the impact of motherhood on female labour market outcomes is large. The difference in annual earnings between women without and with children is 52 per cent 15 years after childbirth relative to the year before maternity. Most of the impact on earnings is due to a reduction in weeks worked: the difference in the number of weeks worked in a year amounts to 47 per cent, reflecting the switch to part-time contracts and a reduction of paid weeks keeping fixed the contract type (for both workers who remain employed – stayers – and those that move to non-employment – leavers – throughout the 21 years around childbirth). The remaining 5 per cent reflects differences in weekly wages (Figure 1).

Furthermore, women with children tend to have slower career progression and move to non-employment more frequently. Exploiting data on firms' balance sheets, the paper shows that mothers tend to work in firms with lower value added, sales, capital and average wages, compared to non-mothers. This is evidence of the presence of sorting effects after childbirth.

Figure 1. The child penalty and its components



Note: The figure reports the child penalty in log annual earnings, and its decomposition into the contribution of reduction in weekly wages, reduction in weeks worked for stayers and leavers, and switch to part-time. The horizontal axis reports the years relative to the year of childbirth. The solid line shows the child penalty in annual earnings. The wage-related penalty is obtained by using log full-time equivalent (FTE) weekly wages as outcome. The weeks-related penalties are obtained by log unadjusted weeks worked, separately for stayers and leavers, as outcomes. Stayers and leavers are workers that remain employed throughout the 21 years around childbirth and those that move to non-employment at least once in the same period, respectively. The part-time penalty equals the difference between the penalty in log FTE weeks and the penalty in log unadjusted weeks. The latter is the sum of the penalties measured for stayers and leavers.

Finally, heterogeneity analysis reveals that the child penalty is stronger for mothers who take longer parental leaves, are low-wage, or are younger than 30 when they have their first child. As to firms' characteristics at the time of childbirth, working in small, low-wage firms, with low-quality peers, and with high share of female workers is associated with a larger penalty in annual earnings. Moreover, long-run child penalties are lower in regions characterised by more progressive views on gender roles.

What Firms Do:
Gender Inequality in Linked Employer-Employee Data

Alessandra Casarico (Bocconi University) and Salvatore Lattanzio (Bank of Italy)

JEL Code: J16, J31, J71.
Keywords: gender wage gap, firm pay premia, between-firm inequality, within-firm inequality, mobility gap.

Journal of Labor Economics, 2023

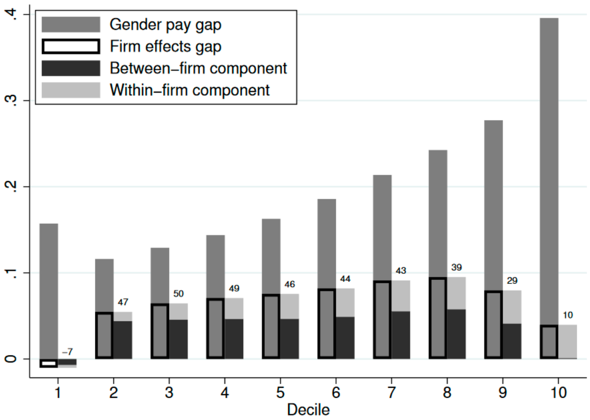
Research question. – Employer heterogeneity contributes to explaining both levels and dynamics of wage inequality. In a frictional labour market, firms can offer pay premia that differently reward workers who are observationally equivalent in terms of education and skills. This can also occur across gender. This paper documents how employer heterogeneity affects the gender gap in earnings across the distribution, over time, and over the life cycle, accounting for cohort effects. To this end, it decomposes the gender gap in firm pay premia into a between- and within-firm component, and explores the extent to which gender differences in mobility towards firms with higher pay premia or larger within-firm gender inequality contribute to the observed gender gap. The analysis relies on a large linked employer-employee dataset that records the work and pay history of the universe of Italian workers in the non-agricultural private sector between 1995 and 2015, covering more than 22 million workers employed by approximately 1.6 million firms.

Results. – The paper shows that gender differences in firm pay premia account for approximately 34 per cent of the gender pay gap at the mean. The between-firm component of the gap, reflecting gender differences in sorting across firms, accounts for two-thirds of the gender gap in firm pay premia. The within-firm component captures gender differences in the allocation of workers across hierarchical levels and in the wage setting within firms, and explains the remaining one-third of the gap.

Gender differences in firm pay premia relate to a number of patterns in the observed gender earnings gap. First, cohort effects in the gender gap in earnings and in firm pay premia, are relevant. At the same age, older cohorts display higher gender gaps in earnings, and in firm pay policy, than younger cohorts.

Furthermore, differences in firm pay premia account for almost half of the gender pay gap at the bottom of the earnings distribution and around a tenth in the highest decile, suggesting that the glass ceiling is not explained by larger gender differences in firm pay policy at the very top (Figure 1).

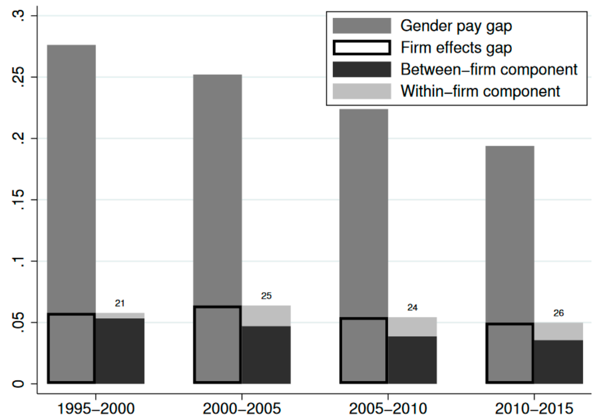
Figure 1. Gender gap in weekly earnings, in firm pay premia, and between/within-firm decomposition along the distribution



Note: The figure shows the gender gap in weekly earnings, in firm pay premia, and its decomposition into between- and within-firm components across decile bins of the distribution of weekly earnings over the period 1995-2015. The numbers reported at the tops of the bars are the ratios between the gender gap in firm pay premia and that in weekly earnings at each decile.

Third, while the gender gap in earnings has decreased over time, that in firm pay premia has almost remained unchanged, increasing its contribution to gender wage inequality. Moreover, the relative importance of between-versus within-firm components has seen a growing role of the latter, potentially reflecting the spread of decentralized wage setting in the Italian labour market (Figure 2).

Figure 2. Gender gap in weekly earnings, in firm pay premia, and between/within-firm decomposition over time



Note: The figure shows the gender gap in weekly earnings, in firm pay premia, and its decomposition into between- and within-firm components over time. The numbers reported at the tops of the bars are the ratios between the gender gap in firm pay premia and that in weekly earnings at each decile.

Finally, the paper investigates firm-to-firm mobility as a potential mechanism underlying the importance of firm pay policy, relying on novel measures of the gender mobility gap. Specifically, it estimates a gender gap in the probability of moving to a firm with a more generous pay policy as a driver of between-firm differences, and a gender gap in the probability of moving to a firm with a higher gender difference in pay policy as a driver of within-firm differences. The results indicate that women are 2.7 percentage points less likely than men to move to a firm with higher pay policy and 1.8 percentage points more likely to move to firms with higher within-firm inequality. These differences are larger when moves are caused by firm closure. When investigating heterogeneous effects by cohort and time, both between and within gender gaps in mobility tend to decline in more recent cohorts and years, making gender gaps in mobility less salient in explaining gender differences in pay policy.

GENDER QUOTAS, BOARD DIVERSITY AND SPILLOVER EFFECTS. EVIDENCE FROM ITALIAN BANKS

Silvia Del Prete (Bank of Italy), Giulio Papini (Bank of Italy) and Marco Tonello (Bank of Italy)

JEL Code: G21, G38, J48, J78.
Keywords: Bank board composition, Diversity, Gender, Corporate governance.

Bank of Italy Working Paper 1395, 2022

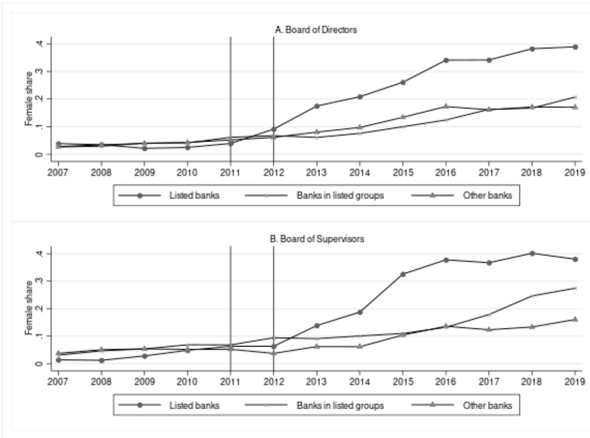
Research question. – This paper investigates the consequences on bank board diversity of an Italian gender quota law requiring all listed companies to increase the share of female representatives in their boards to at least one third of the total seats. The analysis focuses on listed banks (directly targeted by the law), but it also tests whether the law determined spillover effects on non-listed banks belonging to listed groups.

Using administrative data on bank board composition from 2007 to 2019, combined with banks' performance measures, we first study the compliance with the law by listed banks. Then, we investigate whether the implementation of the law: *a)* induced banks to alter the size of their boards; *b)* affected the diversity of board along dimensions other than gender (age, tenure/experience, geographical origin); *c)* had effects also on banks not directly targeted by quotas (but more likely to be subject to the spread of governance practices); *d)* impacted on bank performance, such as profitability or portfolio riskiness.

We compare board diversity measures and performance indicators, before and after the introduction of the gender quota law. We focus on listed banks and non-listed banks belonging to a listed group and compare them with banks belonging to a group not having a listed holding company.

Results. – The Italian quota law increased the share of women on the boards of listed banks, both as directors and as auditors (see figure 1). Using a synthetic indicator, which combines four main sources of board diversity (gender, age, tenure and geographical origin), we also find that only for boards of directors the quota law induced a higher diversity, not entirely explained by the gender component.

Figure 1: Share of female members in the Board of Directors and in the Supervisory Board from 2007 to 2019



Note: the figure depicts the share of female members in the board of directors (Panel A) and supervisors (Panel B) from 2007 to 2019; the first vertical line, in each panel, indicates the approval of the quota law (2011), while the second vertical line indicates the moment when the requirements of the law became compulsory, one year later (2012). Source: OR.SO. archives, Bank of Italy.

Moreover, we find no evidence that the quota enacted for listed banks encouraged banks belonging to listed groups to increase the share of women sitting on their boards, i.e. we do not find evidence of spillover effects from listed to non-listed intermediaries within the same banking group.

Finally, our estimates show that the Italian quota law *per se* did not affect the business performance of listed banks, thus not posing a trade-off between gender equality and firm efficiency, as previously found in some studies on non-financial firms.

Our results raise some implications about the effects of the law, both for regulators and for shareholders. First, since we find that the quota law was only applied by the banks directly targeted by the measure, one might wonder whether they will stick to a gender balanced composition of their boards once the requirement ceases to be effective. Second, we find that the introduction of the law was neutral in terms of the performance of listed banks, so as not to entail an equity *versus* efficiency trade-off in the banking sector.

The Ins and Outs of the Gender Employment Gap: Assessing the Role of Fertility

Marta De Philippis (Bank of Italy) and Salvatore Lo Bello (Bank of Italy)

JEL Code: J13, J11, J16, J22, J71, D63.
Keywords: Child-penalty, Gender employment gap, Labour market flows, Fertility.

Forthcoming *Bank of Italy Working Papers*

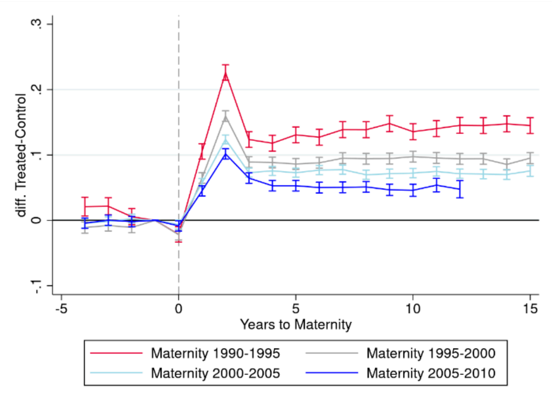
Research question. – This paper investigates the role of fertility for the dynamics of the gender employment gap in Italy, combining detailed data sources covering the period between 1984 and 2019. It first uses data from the Labour Force Survey to analyse the role of transitions between the states of employment, unemployment and inactivity. Then, using social security administrative data on the entire contribution histories of a sample of private sector employees, this paper estimates the dynamics of the so-called *employment child penalty* (the effect of maternity on the probability of entering and exiting employment). Based on these estimates, the paper quantifies the importance of motherhood for the evolution of the gender employment gap over time and the effect of policies aimed at eliminating the child penalty for the gap still in place in 2019.

Results. – First, this paper shows that the gender employment gap has narrowed significantly in Italy between 1984 and 2019, going from 36 to around 18 percentage points. The main determinant of this convergence, and of the remaining gap, is women's participation decisions. In particular, women's flows out of the labour market have declined significantly over time. Instead, the inflows and outflows between the employment and unemployment status of active individuals have much less relevant for the convergence.

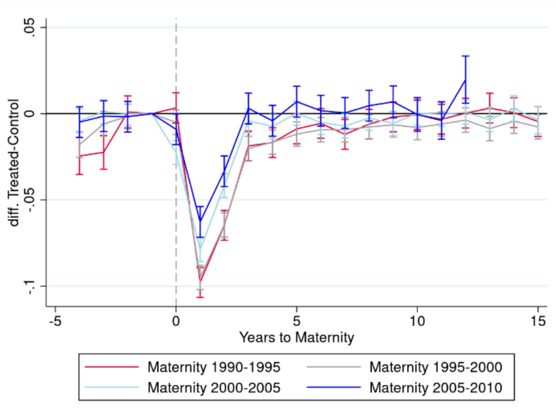
Second, maternity is a crucial determinant of women's decision to participate: the probability of leaving the labour market almost doubles just after maternity and remains permanently higher even 15 years after childbirth; the probability of entering also decreases sharply and for at least 5 years (see Figure 1). These effects lead to large and persistent differentials in employment rates by gender. Last, the negative effect of maternity on flows into and out of employment has decreased significantly over time (by about 50%).

Figure 1: child penalty in flows out of and into employment

a) Flows out of employment



b) Flows into employment



Note: The figure shows the evolution of the flows into and out of employment compared to the year before the birth of the first child for women with children compared to those who never have children (assigning the latter a placebo year of maternity, based on the observed age distribution of the first child among mothers). Additional controls: fixed effects for region times year, age and year of labor market entry. Vertical bars indicate the 95 percent confidence intervals. Individuals are considered employed if they have worked for at least one month in the year.

Overall, the negative trend in fertility and the decline in the child penalty jointly explain about 70 percent of the total increase in the female employment rate in the last 35 years in Italy; about 60 percent is explained by the reduction of the child penalty alone.

A projection exercise shows that eliminating the child penalty for new mothers would increase the female employment by 6.5 percentage points by 2040 (closing around 38 per cent of the remaining gender gap). Removing the child penalty for all mothers would increase the female employment rate by 14 percentage points already in 2030 (closing about 85 percent of the residual gender gap).

Finally, this paper investigates which factors have contributed the most to the reduction in the child penalty over time. In particular, it analyses the role of cultural and institutional determinants, as well as the effect of changes in mothers' characteristics over time. The increase in the share of highly educated mothers, who are more attached to the labour market, can explain a large part of the observed reduction in the child penalty over time. Also the availability of more flexible work arrangements, such as part-time jobs, as and the gradual shift towards more progressive values on gender roles have also contributed the reduction of the child penalty in Italy in the last 35 years.

WOMEN INVENTORS

Sabrina di Addario (Bank of Italy), Michela Giorcelli (University of California) and Agata Maida (Università degli Studi di Milano)

JEL Code: J70, N30, O30.
Keywords: gender-gap, patents, inventors, guilds

Bank of Italy Working Papers, Forthcoming

Research question. – This paper empirically tests whether women's attitude to innovate depends on cultural beliefs about women's role in society that are highly persistent over time.

To this end, the study exploits territorial variability in female participation in Medieval guilds (figure 1) - which, according to some historians, were an instrument that gave women decision-making and economic power. Specifically, the authors construct a historical indicator of gender equality calculated as the share of women in the total number of founding members of eight major Medieval guilds (woolsmiths, silkmakers, tanners, dyers, spice-traders, goldsmiths, blacksmiths, and shoemakers).

The research then examines whether the municipalities that experienced greater female participation in guild formation in the Middle Ages currently show, compared to other cities, a higher likelihood of women of: i) participating to the labor market, ii) earning STEM degrees (Science, Technology, Engineering, and Mathematics) and iii) being patent filing inventors (conditional on a broad battery of individual, municipal, and firm controls).

The work uses several databases: the ISTAT Labor Force Survey for the years 2002-2003; individual-level information on the founders of eight Medieval guilds collected at the Central State Archives; and a dataset that combines INPS data on workers with data on patents filed with the European Patent Office (EPO) by companies residing in Italy in the period 1987-2008.

Figure 1. Female share in Medieval guild members

Source: Authors' elaboration on data from Central Archive of the State in Rome. Notes: The darkest red means that current Italian municipalities in the Middle Ages exhibited a higher share of women in any of the 8 guilds considered in this paper (woolsmiths, silkmakers, tanners, dyers, spice-traders, goldsmiths, blacksmiths, and shoemakers).

Results. – The authors find persistent effects in the very long run.

Italian municipalities that had a higher proportion of women among the founding members of guilds in the Middle Ages display nowadays: i) a higher level of female labor market participation; ii) a higher probability for women to graduate from a STEM majors at university and iii) more female inventors. Finally, while female inventors on average have a lower annual probability of submitting a patent to the EPO than men, in the municipalities that were more egalitarian with respect to gender in the Middle Ages this probability is significantly higher than in other cities.

IT AIN'T WHERE YOU'RE FROM, IT'S WHERE YOU'RE AT: HIRING ORIGINS, FIRM HETEROGENEITY, AND WAGES

Sabrina Di Addario (Bank of Italy), Patrick Kline (UC Berkeley), Raffaele Saggio (University of British Columbia) and Mikkel Sølvsten (University of Wisconsin Madison)

JEL Code: J31, D22.
Keywords: Hiring wages, Sequential auctions, Firm effects, Bargaining, Gender wage-gap.

Journal of Econometrics, 2023

Research question. – Sequential auction models of labor market competition predict that the wages required to successfully poach a worker from a rival employer will depend on the productivities of both the poached and the poaching firms. This research develops a theoretically grounded empirical model that enables the estimation of the impact on gender inequality of the labor market state from which the worker was hired (‘‘origin’’ effect) and the characteristics of both the ‘‘destination’’ firm hiring the worker and the employee.

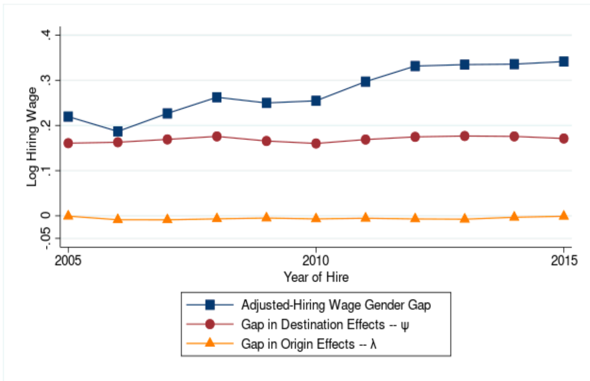
The paper examines gender inequality in hiring wages into a new occupation using INPS data (for the years 1990-2015) that allow us to follow the full working life of all the individuals who were employed at some point by a firm sampled by the Bank of Italy's Survey of Industrial and Service Firms.

Results. – First, the paper shows that “origin effects” explain only 0.7% of the variance of the hiring wages of the individuals who change occupation, while destination effects account for about 24% and individual effects for 29%. The contribution of each of these effects is similar for women and men.

Second, the estimated gender differential in firm hiring wages is 35%. This differential accounts for 90 percent of the gender wage gap observed in the entire working life.

Third, studying a cohort of workers entering the Italian labour market in 2005, we find that differences in origin effects yield essentially no contribution to the evolution of the gender gap in hiring wages, while differences in destination effects explain the majority of the gap at the time of labour market entry. The increase in the gender differential in hiring wages that occurs after ten years of working experience cannot be explained by either origin nor destination effects (Figure 1).

Figure 2: Gender wage gap and origin and destination effects.



Overall, these results suggest that where a worker is hired from tends to be relatively inconsequential for their wages in comparison to where they find a new occupation.

PEER EFFECTS IN PARENTAL LEAVE DECISIONS: EVIDENCE FROM A REFORM

Davide Dottori (Bank of Italy), Francesca Modena (Bank of Italy) and
Giulia M. Tanzi (Bank of Italy)

JEL Code: C31, J13, J22, D04, K31.
Keywords: peers effects, parental leave.

Bank of Italy Working Paper 1399, 2023

Research question. – This paper estimates peer effects in parental leave (PL), analysing whether mothers' leave-taking behaviour may be influenced by that of their colleagues. The peer effect is identified through an exogenous variation in the peers' probability of taking a PL driven by a reform that took place in Italy in 2015, which extended from 3 to 6 years the child's age over which a parent can get a paid PL and allowed for a greater flexibility in its use.

In order to estimate the peer effects, this paper uses a unique administrative linked employer-employee dataset that covers the universe of employees for a sample of Italian firms (mainly composed of medium-large firms). Peer mothers are assigned to each working mother on the basis of the occupation group and the combination of firm and municipality of work (as a proxy for the establishment). The identification strategy follows an instrumental variable approach that exploits the heterogeneity in mothers' exposure to pre- and post-reform peers.

Results. – First, this paper shows that the reform had a clear positive effect on mothers' leave taking behaviour: the likelihood that a mother takes a PL increases on average by about 9 percentage points according to whether she is pre- or post-reform. This could not have been taken for granted because the reform did not increase the total number of available weeks but, by extending the time interval over which a paid PL can be taken, increased the degree of flexibility in their use (i.e. by relaxing the implicit cost of the flexibility). If there was actually no demand for such flexibility, little or no effects would have been seen.

Second, the estimates highlight the importance of peer effects: a 10 percentage point increase of the share of peers that take PL in response to the reform determines a rise of 2.4 p.p. in the probability that a mother takes at least one week of PL. The number of weeks taken per worker also increases. Finally, this paper finds that mothers that have more peers taking PL are less likely to work part-time. This hints that a larger use of parental leave replaces the need to work part-time, likely reducing long-term earnings losses due to changes in the contractual relationship.

Additional analyses in the paper, that show that peer effects are stronger for low-tenure mothers, suggest that signalling about employers' reaction to the use of PLs might be an important channel through which peer effects unfold. In line with social learning models, observing peers may reduce the uncertainty about the specific costs and benefits of PL.

These results are important in order to understand the effects of social interactions on individual behaviour, with important implications from a policy point of view. In fact, observing peers may be a relevant channel to strengthen the take-up of policy measures that help protecting young families and encouraging fertility.

Table 1. Parental leave and peer effects.

	(1) Prob. of taking PL	(2) Intensive margin	(3) Prob. of working part-time
Peers taking PLs (%)	0.243**		-0.609***
	(0.108)		(0.154)
Peers taking PLs (avg annual number of weeks)		0.339**	
		(0.163)	
Observations	102,724	102,724	102,724
Adjusted R^2	0.123	0.098	0.015
F-stat	67.87	26.79	67.87
First stage coeff.	0.085***	0.609***	0.085***
	(0.010)	(0.118)	(0.010)
Dep.var.mean	0.317	2.515	0.420
Dev.std. of the main explanatory variable	0.210	2.572	0.210

Note: IV estimations. Dependent variable: dummy equals to one if the mother takes at least one week of parental leave in column (1), the number of annual weeks of PL taken in column (2), and a dummy equals to one if the mother works part-time in column (3). All columns include year fixed effects (FE), municipality FE, child age FE, workers' characteristics (age and age squared, occupation, dummy for foreign, dummy for temporary contracts, dummy for having more than one child, dummy for low experience in the same firm) and firm's characteristics (sector, firm size, average gross salary, share of 25-49 years old workers, share of foreign born workers, share of female workers). Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

ASYMMETRIES IN THE GENDER EFFECT OF HIGH-PERFORMING PEERS: EVIDENCE FROM TERTIARY EDUCATION

Francesca Modena (Bank of Italy), Enrico Rettore (University of Padova and FBK-IRVAPP), Giulia Martina Tanzi (Bank of Italy)

JEL Code: I22, I23, C21, C35.
Keywords: human capital, higher education, university performance, gender, peers.

Labour Economics, 2022

Research question. – This paper exploits student-level administrative data on the population of Italian university students from 2006 to 2014, in order to analyse the effects of high-performing (HP) male and female peers on individual academic performance, according to the gender of the student. We focus on the effects on first-year academic performance (number of credits achieved, the average grade obtained in the exams and the probability of dropping out), as well as on the students' final academic outcome (probability of graduating and final grades).

Students might directly benefit from working with high-performing peers; however, a high exposure to HP male or female peers might affect the course atmosphere, because students might be discouraged and perform worse if they meet peers who just seem to "know it all". The effects of exposure to high-ability peers may vary according to the gender of the students and of the peer. Indeed, a rich and growing line of research has provided evidence that women and men are likely to differ with respect to psychological traits, self-esteem, risk preferences, and attitudes toward competition and collaboration, with important implications for the ways in which the high-ability peers can influence students' behaviour and performance.

Results. – Consistently with earlier studies, we find that the fraction of HP students positively and significantly affects students' achievement.

In addition, we find a clear asymmetry in the peer effect depending on one's own and the peers' gender. In particular, there is evidence that same-gender HP peers have the strongest positive effects. This can be rationalized within the role model framework that, applied in the education context, suggests that being surrounded by students who are "similar" in terms of gender and observing them doing particularly well positively affects students' perception of themselves, their study efforts, attitudes towards class and socializing behaviour. The stronger positive effect found when the HP peer–student gender is matched may be also the result of enhanced peer interaction between students of the same sex.

The second important result of this analysis refers to the different effect of HP males and females on the opposite-gender students. Indeed, on the one hand, we find that HP females have beneficial effects on males too (even if smaller in magnitude). This can be explained by the fact that women appear to be more collaborative than men, regardless of the gender of the other person. On the other hand, HP males do not exert any effect on their female peers and when they do so - for example when considering the probability of getting higher grades - this effect becomes even negative. This is consistent with the psychological theories and with the results of the literature according to which women tend to be discouraged by competition with men.

Implications. – This paper has relevant implications for the design of more effective education policies. First, since student quality is an important input, our results should induce universities to attract higher-quality students. Second, our findings also give some indications to universities on the best allocation strategy of students into classes, so to maximize aggregate achievement. For example, in large departments with many classes, it could be optimal to allocate the best female high school graduates evenly across classes, since the benefit of having more HP female peers in one class could be offset by the cost of having fewer female peers in another class. Finally, our results point out the importance of encouraging more collaboration in some particularly competitive environments and in settings characterized by large gaps in skills among students, through - for example- the promotion of team work and group activities within and after classes.

Choosing Wisely: Discrimination and Effectiveness of the Selection Procedure at the Bank of Italy

Santiago Pereda Fernández (Bank of Italy, Universidad de Cantabria)

JEL Code: J7, J16.
Keywords: Central banks, gender discrimination, hiring of employees, multiple-choice tests.

Research question. – The selection of employees in the Italian central bank is done through a competitive exam. I evaluate the different stages of this exam, analysing its final effectiveness in hiring the best candidates, so as to assess whether is the exam format produces any kind of implicit discrimination on the basis of gender. To do so, I consider a multi-equation model that combines the score obtained by each candidate at each question, the choice of which questions to answer and individual unobserved heterogeneity.

Results. – The results indicate that the exam does a good job at discarding less able candidates, as those who pass to the successive stage of the exam have on average higher ability than the initial pool of applicants.

The job performance of hired candidates at the beginning of their careers displays a slightly positive relation with the exam performance indicators. In particular, the estimate of individual unobserved heterogeneity is a positive predictor of both hours worked and earnings enjoyed later in their career at the Bank of Italy.

Differences in exam performance across genders suggest a marked difference in the amount of self-selection prior to the exam. Even though the implied difficulty of each question was lower for men than for women on several test questions, these constitute a minority. Moreover, no important and significant differences arise in the written and oral stages. Indeed, the estimated average value of unobserved ability of hired candidates is of similar magnitude for both genders. In addition, work performance during their first years as employees is not significantly different between men and women.

Finally, I show that some variations of the structure of the exam could lead to an improvement of the selection process, increasing the average ability of the selected candidates. First, eliminating the penalization for wrong answers in the test and increasing the difficulty of the questions would lead to an increase in the average ability of selected candidates. Moreover, encouraging candidates not to drop out would have a qualitatively similar effect. On the other hand, substituting questions that are perceived as biased between both genders would have a very limited effect on the outcomes of interest, whereas setting quotas in the pre-selective test could backfire, decreasing the average ability of selected candidates, and even reducing the proportion of female hirings.