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The Evolution of Gender in the Labor Market

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DISCUSSION PAPER SERIES

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ABSTRACT

The Evolution of Gender in the Labor Market*

This chapter traces the evolution of the study of gender in the labor market, focusing on how academic thinking on this topic has evolved alongside real world developments in gender inequality from the 1980s to the present. We present a simple model of female labor supply to illustrate how various forces discussed in the literature (e.g., productivity differentials, unequal gender roles, wage markdowns) affect the gender earnings gap. A major development in the literature is a clearer distinction between intrinsic differences in preferences and skills between men and women versus differential constraints in driving gender gaps. We discuss insights from research on the relative importance of these explanations, and the implications for economic efficiency. We highlight that much of the literature today emphasizes the relevance of gendered constraints, where women and men typically face differential trade-offs between family and career, with implications for job sorting, job search, and earnings. These constraints have their roots in gender roles within the household that are shaped by wider societal norms. We review recent research that establishes the relevance of identity and norms for understanding gender inequalities in the labor market, both on the supply-side and on the demand-side, as well as what drives the formation and evolution of these norms. Finally, we conclude with suggestions for future research.

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Contents

1 Introduction

The remarkable progress of women in the labor market marks one of the most significant economic and social changes of the past half a century. Accompanying these developments has been a large increase in interest in gender topics in the economics profession since the 1990s, culminating in the award of the 2023 Nobel Prize in Economics to Claudia Goldin for her pioneering work on understanding women's labor market outcomes through the centuries.

While understanding women's outcomes in the labor market is an important topic of inquiry in its own right, the study of gender in itself has significantly contributed to modern labor economics more generally. As Claudia Goldin remarks in her 2006 American Economic Association (AEA) Presidential Address:

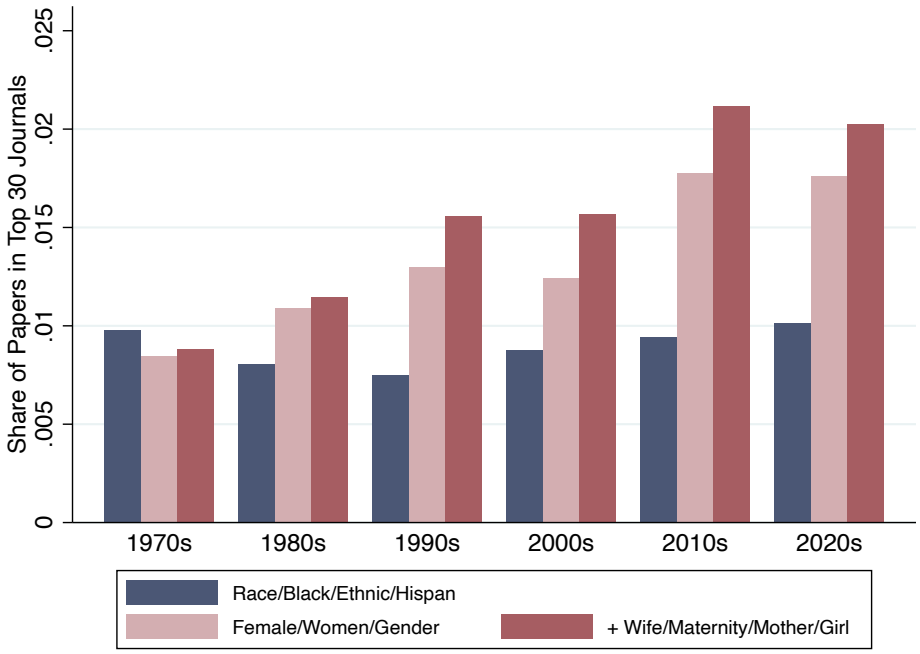
> It would not be much of an exaggeration to claim that women gave "birth" to modern labor economics, especially labor supply. Economists need variance to analyze changes in behavioral responses, and women provided an abundance of that. Men, by and large, were not as interesting, since their participation and hours varied far less in cross section and over time. (p. 3)

Figure 1 illustrates how interest in gender topics within the economics profession has changed over time by comparing the share of papers in the top 30 economics journals that are on gender-related topics versus race-related topics.[1] We classify paper topics based on keywords pertaining to gender (i.e., female, women, gender) or race (black, ethnic, hispanic, race) in the title. In addition, we include a more expansive set of keywords (wife, maternity, mother, girl) to identify gender-related topics. While the share of race-related papers in the top 30 economics journals has remained relatively constant at about 1% from the 1970s to the 2020s, the share of gender-related papers has increased steadily over the period, from around 0.8% in the 1970s to about 1.8% in the 2020s. The patterns are even more striking when we use the more inclusive set of keywords to identify gender-related topics.

The study of gender has also expanded from fairly niche topics in labor and family economics to other fields in economics. Figure 2 further classifies gender-related papers in the top 30 economics journals into various sub-topics based on keywords in the title. Not surprisingly, most gender papers are about the labor market or family related topics. Nevertheless, between the 1970s/1980s and the 2010/2020s, the share of gender papers relating to traditional labor-related topics halved, and were replaced by papers relating to development, health, political economy, finance, and behavioral economics. The share of gender papers relating to family

[1] The list of top 30 economics journals used for this exercise can be found in Appendix Table A.1.

Figure 1: Gender vs. Race Papers in Top 30 Economics Journals



Note: Titles of papers published in the top 30 economics journals are extracted from Econlit. Each time period covers all papers published in the top 30 economics journals during that period. The 2020s time period is limited to the years up to 2023. To identify gender and race papers, we first perform text normalization on the titles by stemming the prefixes and suffixes followed by a keyword search using the lexical items listed in the legend above. The blue bars show the share of race-related papers; the red bars show the share of gender-related papers using different sets of gender-related keywords. Appendix Table A.1 lists the top 30 economics journals used for this exercise.

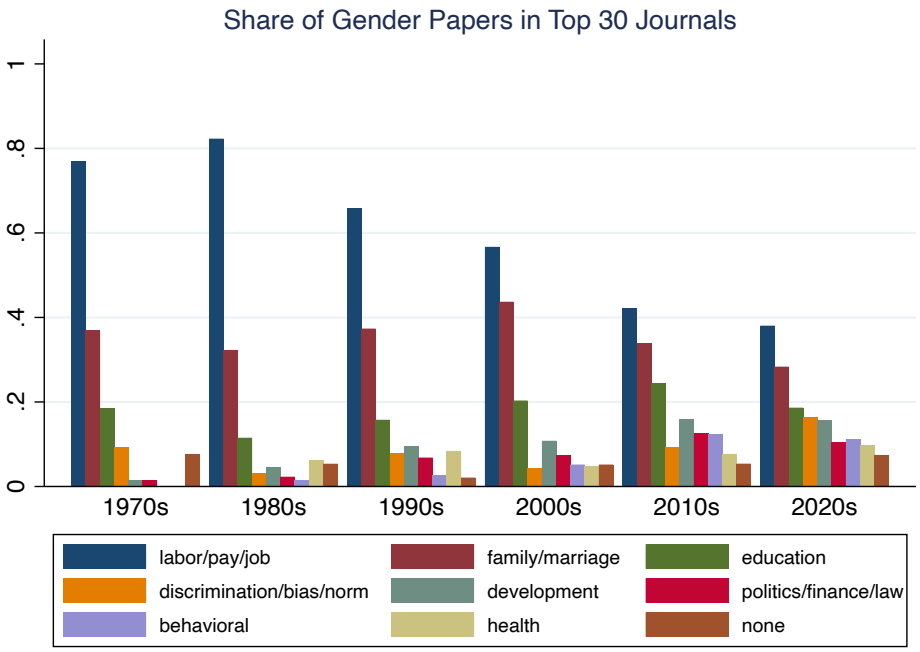
economics and education remained relatively constant over this period. As such, gender-related papers have become much more evenly distributed across subfields in economics today.[2]

This chapter traces the evolution of the study of gender, focusing on how academic thinking on this topic has evolved, and how past insights inform current perspectives on addressing the remaining gender disparities in the labor market.

In Section 2, we begin by describing the main developments in gender inequality in the labor market since the 1980s and how academic research has evolved alongside. Most of the evidence discussed refers to the United States, but we argue that the key takeaways provide a representative picture of gender inequalities in most high-income countries. While women have made significant progress in closing gender gaps in earnings, the allocation of work is to date

[2]Classifying papers based only on their titles is likely to lead to an undercount of the number of race and gender papers. We explored the issue using a similar keyword search procedure applied to paper abstracts; however, this tends to lead to an overcount since many papers that are not primarily about race or gender report dimensions of heterogeneity on the basis of these characteristics. We use data on assigned "subjects" to papers available from EBSCO, a leading provider of research databases and e-journals, to show that the patterns described above hold when papers are classified using subject keywords instead of titles. The results from this exercise are reported in Appendix Figure A.1 for 21 of the 30 journals for which subject information is available from EBSCO.

Figure 2: Evolution of Topics Among Gender Papers



Note: Titles of papers published in the top 30 economics journals are extracted from Econlit. Each time period covers all papers published in the top 30 economics journals during that period. The 2020s time period is limited to the years up to 2023. The subset of gender papers is identified using a keyword search of the paper titles by first performing text normalizations on the titles by stemming the prefixes and suffixes followed by a procedure that flags out gender-related keywords (female/women/gender/wife/matern/mother/girl). Papers are classified into the various pre-defined topic groups based on the presence of the topic-related words in the title. The list of keywords used to identify each topic can be found in Appendix Table A.2.

heavily gendered, both in the labor market and in the home. Women continue to be less likely to participate in the labor market, and those who are employed work fewer hours than men. Even among those fully attached to the labor market, women continue to earn less per hour worked. Moreover, women's under-representation in market work is more than offset by their disproportionate share of unpaid work in the home. Thus, women tend to enjoy less leisure time than men and their work is overall less conducive to social prestige or bargaining power within the household. As women have overtaken men in terms of completed years of schooling, and narrowed their gap in work experience relative to men, slightly more than half of the gender wage gap is now accounted for by the differential sorting of women and men into occupations and industries, with the remainder "unexplained" by observable characteristics.

The role of these forces is represented in Section 3 within a model of female labor supply, in which gender gaps in earnings reflect gender differences in the allocation of working time between the home and the market, productivity, and wage markdowns below productivity levels. Despite its simplicity, the model provides a versatile tool to illustrate how unequal gender roles in the

household and departures from competitive wage setting can shape earnings gaps even once productivity differentials vanish.

Why do men and women work different hours in the market and the home, sort into different jobs, and face different wage returns? Current academic thinking emphasizes two fundamentally different explanations for the existence of such gaps, which we elaborate in Section 4. One view is that men and women have *inherently* different preferences, skills, or psychological traits that drive their choices in education and careers. In this case, gender inequality is simply a manifestation of essential differences between men and women. The other view posits that men and women are similar in the relevant dimensions, but face different opportunities and constraints. In this case, gender inequality can be a symptom of misallocation, and policies that promote gender equality can improve allocative efficiency. Naturally, a key challenge is that observed gender differences in skills, traits, or preferences could themselves be endogenous to constraints in the form of norms, stereotypes, and discrimination.

In Section 4.1, we summarize findings from a body of research investigating gender differences in psychological traits and preferences since the 2000s. The emerging consensus is that those differences play, at best, a modest role in accounting for the observed gaps in pay (Blau and Kahn, 2017). Moreover, research in social psychology that has studied gender differences in a wide variety of domains including cognitive traits, communication styles, personality and social traits, establishes that, with a small number of exceptions, the data suggests that women and men are more alike than they are different (Hyde, 2014).

The relevance of gendered constraints for understanding the remaining gender gaps has shifted the academic discourse to be more upfront about the allocative efficiency consequences of persistent inequality, recognizing that enabling both women and men to reach their full potential in the labor market can confer significant economic gains through improved talent allocation, and need not come at the expense of the other group. Supporting this view, seminal work by Hsieh et al. (2019) documents the recent economic growth gains resulting from improved access to labor market opportunities for women and black men in the US.

Women's primary role of childbearers and carers is emphasized as one key hurdle to their continued participation and especially to their entry and retention into highly-paid but time-demanding careers. In Section 4.2, we provide an in-depth review of how the literature has approached the study of the differential trade-off between family and career for mothers and fathers. This literature, which has gained momentum over the past decade, has renewed interest in, and created links with, early work in family economics, bringing richer data and a varied set of methodologies to the identification of the career costs of parenthood. The clear consensus from

this research indicates that parenthood drives widening gender gaps in earnings and, following the decline in productivity gaps and outright pay discrimination, the remaining gender gaps in developed countries "are mostly about children."

Section 5 describes the anatomy and dynamics of motherhood penalties, highlighting how differential constraints result in equally able women and men sorting into different types of jobs that reward workers differently to accommodate career-family considerations. Recent work has emphasized the role of preferences for job amenities such as shorter hours and commutes, work flexibility and working from home. These translate into earnings gaps whenever women have a higher willingness to pay for family-friendly amenities than men. Such constraints have demand-side implications as well, whereby women's smaller choice set over jobs could result in wage-setting power for employers in monopsonistic labor markets.

Section 6 turns to the discussion of gender identity norms. The observation that work-family issues continues to remain a "woman's problem" despite women's economic progress has brought to the fore the relevance of cultural and identity-related factors in understanding the remaining disparities in the labor market. Indeed, since the last Handbook chapter, an influential body of work has firmly established the importance of gender norms for family formation, household specialization, and labor supply. We then discuss how stereotypes and beliefs about the women's (and men's) abilities and the appropriate set of activities that they should engage in could lead to pre-market discrimination in the form of constraints to skill investment and educational choices, as well as differential treatment by employers. The net effect is a self-fulfilling cycle where individuals' preferences, traits, and skills are endogenous to gendered norms and societal expectations.

The relevance of norms for understanding gender inequality has sparked an active literature that seeks to understand what drives gender norms and how to change them. In section 6.3 we discuss relevant work on the historical origins of norms, the drivers of cultural change, transmission channels, and an emerging strand of work that suggests that information gaps could be an important contributor to the stickiness of norms. Finally, Section 7 concludes with some suggestions for future research.

2 Real World and Academic Developments in Gender Inequality

The convergence in gender trends in all high-income countries, alongside persistent inequalities to date in most indicators of labor market success, have spawned decades of research on gender.

To understand the development of academic perspectives on this topic, we start by describing the evolution of gender differences in labor income in the US, using data from the Panel Survey of Income Dynamics from 1980 onwards.

Between 1980 and 2018, women's employment to population ratio in the US has risen from 58% to 74%, average weekly hours for those in work have increased from 38 to 41 per week (while men's average weekly hours were stable at 46 hours per week), and their hourly wages have risen from 62% to 76% of male wages. We capture these trends by showing the evolution of the gender gap in earnings, defined as the difference between male and female average earnings, relative to men's earnings. This is a summary measure that captures gender differences in all dimensions of working life, reflecting whether and how much men and women work, the types of jobs they do, their experiences and skills, the returns to these, and frictions in wage setting, if any, including discrimination.

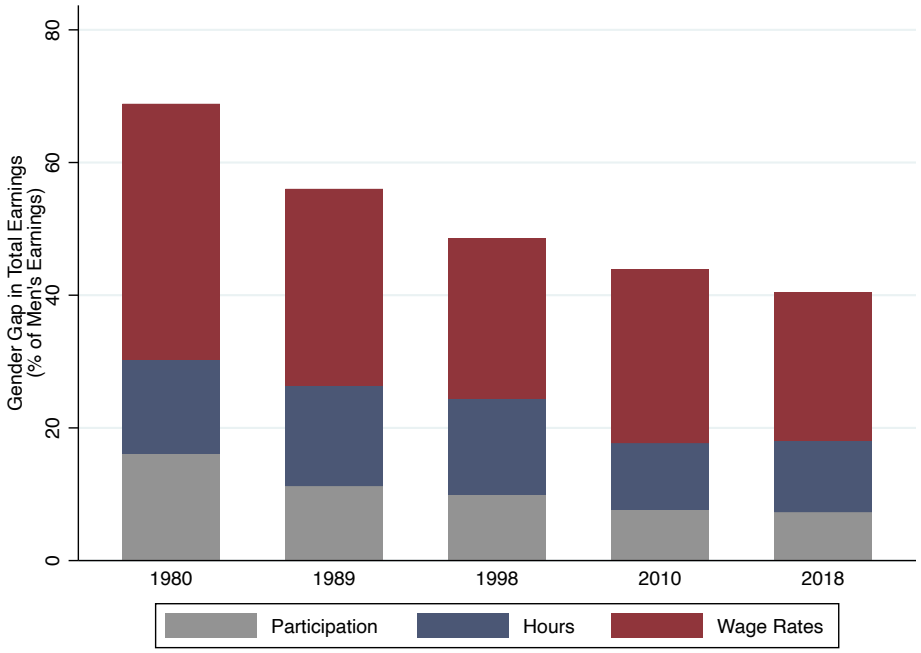
Figure 3 shows trends in the gender gap in labor earnings for each decade from 1980 to 2018 for men and women aged 25 to 64. Individuals who are not working are assigned zero earnings. In 1980, the gender gap in earnings, as a percentage of men's earnings was 69% (i.e., women earned less than a third of men's earnings). The gap fell considerably over the next two decades, and in 1998, women's earnings were about 50% that of men's. Convergence continued, albeit at a slower pace in the last two decades. In 2018, the gender gap in earnings stood at 40%.

Following the procedure outlined in Kleven and Landais (2017), we decompose the observed earnings gaps in each time period across these three margins: women being employed at lower rates (in grey), employed women working fewer hours than employed men (in blue), and women earning less per hour than men (in red).[3] Across all time periods, while all three margins play an important role in accounting for gender differences in earnings, differences in wage rates typically account for more than half of the overall gap in earnings. The decline in the earnings gap over the past five decades has been driven by improvements in women's relative outcomes across the three margins. As a proportion of the overall gap, the contribution of wage gaps has been relatively stable over time, while the contribution of gender differences in participation has declined from about 23% of the overall earnings gap to about 18% in 2018. Correspondingly, the portion of the overall earnings gap due to women working shorter hours has increased over this period.

All three margins also play an important role in most high-income countries (see Andrew et al., 2024, Fig. 1), with some interesting patterns. First, the gap in hours tends to be larger where

[3]The "participation" component reflects gaps in participation conditional on wages and hours being equal, the "hours" component reflects gaps in average hours conditional on wages being equal, and the "wage rates" component reflects gaps in average wages per hour worked. Note also that for this decomposition to work, average wages for each gender is an hours-weighted average wage rate. More details can be found in the note to Figure 3

Figure 3: Gender Gap in Earnings: Role of Participation, Hours, and Wage Rates



Note: The data is from the 1981, 1990, 1999, 2011, and 2019 waves of the Panel Study of Income Dynamics (PSID) and includes household heads and spouses/cohabitors aged 25–64. The choice of years is based on an attempt to create 10-year blocks and the availability of PSID data which are only available biennially post-1997. The gender gap in total earnings is given by $\Delta^Y = (\bar{Y}^m - \bar{Y}^f)/\bar{Y}^m$. Following Kleven and Landais (2017), this can be decomposed into the sum of components ($\Delta^Y = G^W + G^H + G^P$) driven by gaps in wages ($G^W \equiv (\bar{w}^m - \bar{w}^f)/\bar{w}^m$), gap in hours conditional on wages being equal ($G^H \equiv (\bar{h^m} - \bar{h}^f)/\bar{h}^m \times \bar{w}^f/\bar{w}^m$) and gaps in participation conditional on wages and hours being equal ($G^P \equiv (\bar{p}^m - \bar{p}^f)/\bar{p}^m \times \bar{w}^f/\bar{w}^m \times \bar{h}^f/\bar{h}^m$), where $\bar{h}^g$ and $\bar{p}^g$ denote average hours of gender g conditional on working, and the employment rate, respectively. $\bar{w}^g$ is the hours-weighted average wage rate for each gender g (i.e., $\bar{w}^g = \frac{\sum w_i^g \cdot h_i^g d_i^g}{\sum h_i^g d_i^g}$, where d_i^g indicates whether individual i participates, and w_i^g and h_i^g are the wages and hours of individual i, respectively).

the gap in participation is smaller. It is likely that in countries where most women work outside the home, jobs have adjusted to facilitate the combination of home and market work and part-time work becomes widespread (e.g. in the Netherlands, the UK, and Ireland). Where fewer women work, most jobs are full-time, and gaps in hours are smaller (e.g. in southern Europe). Second, the gender wage gap is also negatively correlated to the employment gap. Olivetti and Petrongolo (2008) highlight that this correlation is consistent with positive selection on labor market returns, implying that in countries with lower female participation, high-wage women tend to be over-represented in the employed population. The US is among the countries in which gaps in hourly wages explain the largest share of earnings gaps.

We further analyze the sources of the gender gap in wage rates in the US by using a traditional Oaxaca-Blinder decomposition of male-female differences in log wages into a component accounted for by differences in characteristics and an unexplained component. Of particular interest in such a decomposition is the role played by human capital characteristics (e.g., education

and experience), job characteristics (e.g., occupational, industry), background characteristics (e.g., race, region, and union status), as well as well as the residual (unexplained) gap.

We build on the decomposition reported by Blau and Kahn (2017), extending the analysis to include a more recent time period and a couple of intermediate years. The sample is similar to that for the previous figure, except that – because we are focusing on wage rates – we further restrict the sample to non-farm wage and salary workers who worked full-time, for at least 26 weeks during the preceding year.

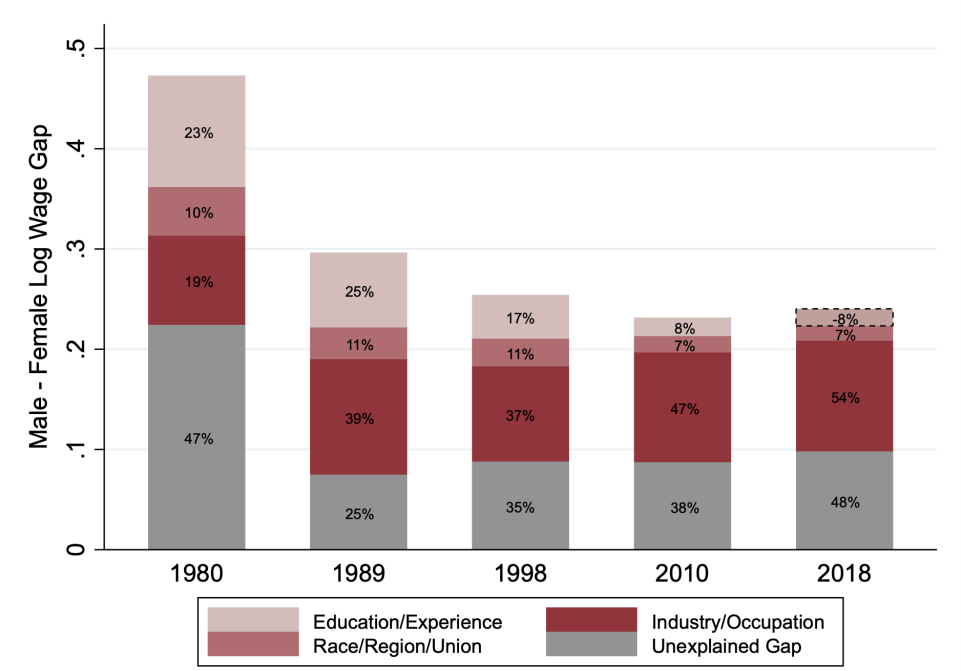
As shown in Figure 4, in 1980 women's wages in the US were, on average, 62% of men's wages. Controlling for gender differences in human capital closes the gap by about 11 log points, and additionally controlling for job characteristics – occupation, industry – closes the gap further by about 9 log points. Over time, gaps in human capital (education and experience) explained increasingly less of the remaining gap such that by 2018, as women outpaced men in terms of educational attainment, controlling for these variables served to *raise* women's relative wages by 9%. By 2018, women's wages had risen to 80% of men's wages, with more than half of the gender wage gap accounted for by industry and occupation.

While the evidence shown is restricted to labor market outcomes, gender gaps in earnings are associated to reverse gaps in unpaid work in the home. Indeed, in the vast majority of countries, including the US, the allocation of work inside the home is more heavily gendered than in the market, with women performing twice as much unpaid work as men on average across OECD countries (Andrew et al., 2024, Fig. 2). The implication is that men can enjoy more leisure time than women: in the same data, women's leisure time is, on average, 86% that of men's. Moreover, paid and unpaid work do not convey the same economic power and prestige. In fact, work inside the home is not counted as "employment", while the same activities – e.g. educating children, keeping accounts or cleaning – would be filed under employment if performed outside the home.

Along with these broader trends in the labor market, previous volumes of the Handbook offer insights as to how perspectives on gender have evolved over time among labor economists. Table 1 provides a summary of the different phases of research in gender, highlighting the real-world developments in gender inequality alongside the developments in academic research in each decade from the 1980s to the present day. Over time, there has been a clear shift away from viewing women and men as single, representative agents, toward a household-centric view where men and women take on dual roles in the labor market and the home, shaped by work-family trade-offs and cultural influences.

In the first Handbook volume published in 1986, Killingsworth and Heckman (1986) and

Figure 4: Decomposition of Gender Log Wage Gap Over Time



Note: The data is from the 1981, 1990, 1999, 2011, and 2019 waves of the Panel Study of Income Dynamics (PSID) and includes household heads and spouses/cohabitors aged 25–64 who were full time, non-farm, wage and salary workers who worked for at least 26 weeks during the preceding year. The dependent variable is the log of average hourly earnings, which is computed by dividing annual labor earnings by annual hours worked for the year prior to the interview. The decomposition procedure and sample restrictions follow that of Blau and Kahn (2017) except that region controls are used instead of Metropolitan Statistical Area (MSA) as that variable is not available in the public-use version of the PSID. In addition, the analysis includes the intermediate years of 1989 and 1998, and extend the analysis to 2018.

Montgomery and Trussell (1986) document and model pre-1980 trends in female labor supply and fertility, respectively, against the backdrop of an "exogenous" rise in female relative wages. A decade later, the 1999 Handbook volume suggests a more integrated approach toward the study of gender, with Altonji and Blank (1999) providing a comprehensive overview of race and gender in the labor market, focusing on the role of human capital accumulation, work experience, and discrimination as key determinants of observed differentials in earnings and participation. A separate chapter is devoted to approaches to modeling labor supply and discusses family labor-supply models in detail (Blundell and Macurdy, 1999).

Altonji and Blank (1999) summarized the 1990s consensus on the role of women's human capital gains in the ongoing process of gender convergence in earnings. Despite the closing of gaps in schooling and actual labor market experience, sizeable gaps in earnings remained, to a large extent associated with systematic differences in the jobs done by men and women. Important open questions remained about the drivers of substantial occupational segregation, which potentially reflected women's lack of specific human capital for entry into high-earnings occupa-

Table 1: Summary of Different Phases in Research on Gender

	Real-World Developments	**Academic Research**
1980s	• Substantial increase in female labor supply from the 1940s to 1980. • Stylized facts on female labor supply over the lifecycle, by marital status, and presence of children. • Large gender pay gaps in 1980: 48 log points (20% explained by education/experience)	• Modeling and estimating labor supply elasticities of men and women. • Understanding selection of women into participating in the labor force. • Models of family labor supply • Models of household formation, childbearing, and home production, with implications for female labor supply.
	HLE Vol. 1 (1986): Labor Supply of Men (Pencavel), Female Labor Supply (Killingsworth/ Heckman), Models of Marital Status and Childbearing (Montgomery/Trussel), Home Production (Gronau)	
1990s	• Continued increase in female LFP and decline in gender pay gap. • Gender pay gap between 25 to 30 log points in the 1990s, partly explained by education and experience, and to a larger extent by occupation and industry differences.	• Understanding determinants of gender differentials in pay and participation through decomposition methods. • Role of occupational segregation and discrimination as key determinants of gender disparities. • Further development of family labor supply models.
	HLE Vol. 3 (1999): Race and Gender in the Labor Market (Altonji/Black) Labor Supply: A Review of Alternative Approaches (Blundell/McCurdy)	
2000s	• Gender wage gaps in the U.S. plateau at around 20 log points in the early 2000s, but continue to narrow in other rich countries. • Increase in female LFP began to slow and plateau in the 1990s. • Reversal of the gender gap in education. Human capital differences explain little to none of the gender pay gap.	• Focus on "new classes of explanations" for gender differences in earnings and occupational choice such as gender differences in preferences and psychological attributes and the role of gender identity norms.
	HLE Vol. 4 (2011): New Perspectives on Gender (Bertrand)	
2010s - Present	• Substantial gender gaps in earnings and participation continue to persist. • Large earnings/labor supply declines associated with parenthood for women, but not for men.	• Work-family trade-offs faced by women result in differential sorting across and within jobs and firms. • Clearer distinction between the role of inherent differences between men and women and differential opportunities and constraints. • Emphasis on gender norms and stereotypes as a fundamental source of differential constraints.

tions, stronger discrimination in certain occupations, differential preferences, or a combination of the three.

With the narrowing of pre-market differences, a major development starting in the early 2000s was the focus on "new classes of explanations" for gender differences in earnings and occupational choice. With application of the experimental approach to studying gender and the availability of rich, administrative databases for several countries – as well as the influence of social psychology in economics – research has taken on board novel questions such as the study of gender differences in preferences and psychological traits and the role of identity norms in prescribing appropriate behavior for men and women in the family, the labor market, and society at large. The most recent Handbook chapter by Bertrand (2011) developed these novel perspectives on gender and laid the path to an especially active strand of research on the role of identity norms in shaping preferences, peer influences, family formation and career choices.

The latest decade has seen the emergence of a more upfront distinction in the literature between the roles of gender differences in attributes or preferences and differential constraints in the access to labor market opportunities. Several studies have explored the economic significance of psychological factors in the labor market (see the discussion in Blau and Kahn, 2017). Concurrently, research has increasingly emphasized work-family trade-offs, which appear to account for much of the remaining gender inequalities, despite advancements in economic forces and family friendly institutions that should have alleviated these constraints. This body of work has built on stark gender differences in unpaid work, coupled with the differential value attached to home vs. market work, as a significant barrier for women seeking a career and, conversely, for men seeking to spend more time on family care. Additionally, the literature has devised credible strategies for evaluating the effects of gendered norms and stereotypes in shaping differential constraints in marriage and labor markets. In the rest of this chapter, we represent the roles of these forces within the labor supply choices of a unitary household and critically review the main literature contributions in this field.

3 Women's Labor Supply and the Gender Gap

We illustrate in a simple framework how various forces (technological, institutional, or cultural) operate on the convergence or – conversely – the persistence of gender gaps in labor market outcomes. The purpose of the model is illustrative, not exhaustive, making a number of simplifying assumptions to ensure a parsimonious representation of the economic mechanisms underlying women's labor choices and the gender gap in earnings. The framework features all earning margins – participation, hours of work and wage rates – which have played a role in narrowing gender inequalities and still play a role in their stalling convergence.

We model female labor supply taking wages as given. An individual's wage w can be

decomposed into a latent "competitive" wage, equal to the marginal product of labor p, and a markdown below the competitive compensation level. Non-competitive forces may drive markdowns for both genders but, given the focus of this chapter, we assume for convenience that men are paid the competitive wage ($w_m = p$), while equally productive women are paid a fraction $w_f = \phi p$, where $\phi < 1$ represents the mark-down. For example, women might face statistical, taste based, or monopsonistic discrimination on a given job (Lundberg and Startz, 1983; Flabbi, 2010; Manning, 2003). In addition, women may face entry barriers in certain occupations, or constraints to the range of acceptable jobs (Goldin, 2014a,b). As our model does not explicitly model occupational choices, we can subsume occupational "downgrading" into the parameter ϕ.

Men and women may also differ in their productivity (p_g, $g = f, m$), reflecting human capital differences (years of education, college major, work experience, etc.) and technological features. Whenever women are on average less productive than men, a gender pay gap would emerge even in competitive labor markets ($p_f < p_m$, $\phi = 1$). As women's human capital becomes more similar to, or surpasses, men's (Blau and Kahn, 2017), and brawn-saving technologies compensate women's comparative disadvantage in physical tasks (Heathcote et al., 2010; Ager et al., 2023), other factors become more relevant determinants of the gender earnings gap, subsumed in the wedge ϕ. Our framework will illustrate the importance of household specialization as a determinant of the gender earnings gap and discuss comparative statics results related to factors that affect household allocation decisions, human capital, discrimination or other frictions.

3.1 The Labor Supply of the Secondary Earner

We model the labor supply of the secondary earner within a unitary (opposite-sex) household, deriving utility from consumption of commodities (e.g. meals, vacations, childcare) produced with combination of market goods (m) and home production (H). The specific approach taken builds on the informal conceptual framework of Blau and Winkler (2021, ch. 6). The assumption here is that all household consumption is a public good, and market goods and home time are intermediate inputs in the production of the final good.

Each partner in the household has a unit time endowment. We assume that the husband works full-time in the market, supplying a fixed amount of time $\bar{h}_m$ at the wage rate w_m, and spending the remaining time $1 - \bar{h}_m$ in home production activities.[4] The couple jointly chooses the wife's labor supply to the market, h_f, and her contribution to the production of the household public good, $1 - h_f$.

[4]The assumption that there is no private consumption or that men are the primary earners can be easily relaxed.

Home production H combines the time inputs of the two spouses according to $H = (1 - h_f)^{\eta}(1 - \bar{h}_m)^{1-\eta}$, where η denotes the relative importance of the wife's time for home making. This parameter may reflect gender absolute advantages in home making, intrinsic preferences, or gendered norms about the division of home production. Based on the assumptions made, the household's budget constraint is given by $m = w_f h_f + w_m \bar{h}_m$. The relationship between income and the wife's home time is shown graphically in Figure 5, with a kink corresponding to the case when the wife fully-specializes in home production ($h_f = 0$).

We consider a logarithmic household's utility function in market goods and home production, $U = (1 - \theta)\ln(m) + \theta \ln(H)$, where θ represents the time intensity in the production of the household's public good. The couple's maximization problem can be written as

$$\max_{h_f \geq 0} (1 - \theta)\ln(w_f h_f + w_m \bar{h}_m) + \theta \left[\eta \ln(1 - h_f) + (1 - \eta)\ln(1 - \bar{h}_m)\right]. \tag{1}$$

The parameters θ and η can vary across households, giving rise to interesting comparative statics. For example, households with higher θ have a preference for time-intensive commodities (e.g. cooking meals from scratch or relying solely on parental time for childcare), or more limited access to time-saving technologies. Households with higher η more strongly value women's involvement in home production, for example because they believe that having a working mother is especially detrimental to the well being of young children.

The household maximization problem has an interior solution $U'(h_f) = 0$ whenever the market wage is larger than the wife's reservation wage, w_r, representing the value of the wife's home time when she fully specializes in home production, i.e. $h_f = 0$. If $w_f < w_r$, the market wage does not provide the couple with sufficient incentives to deviate from full specialization. Analytically, the reservation wage is given by $w_r = \frac{\theta}{1-\theta}\eta w_m \bar{h}_m$ and it depends solely on preferences for commodity production and husband's income. The reservation wage is higher in households with more traditional gender roles (higher η), a stronger preference for time-intensive consumption (higher θ), or higher income (with $w_m \bar{h}_m$ capturing income effects).

When $w_f \geq \frac{\theta}{1-\theta}\eta w_m \bar{h}_m$, the household's choice is described by the first-order condition:

$$(1 - \theta)\frac{w_f}{w_f h_f + w_m \bar{h}_m} = \theta\eta \frac{1}{1 - h_f}. \tag{2}$$

Recall that households are choosing the optimal combination of market goods and home hours in the production of the public good consumed. The left hand size of equation (2) is the marginal benefit of buying an additional unit of market goods via longer wife's hours in the market. The right hand side represents the marginal (opportunity) cost of doing so, in terms of lost utility from the home-produced services. Re-arranging, the optimal home time for a working wife is

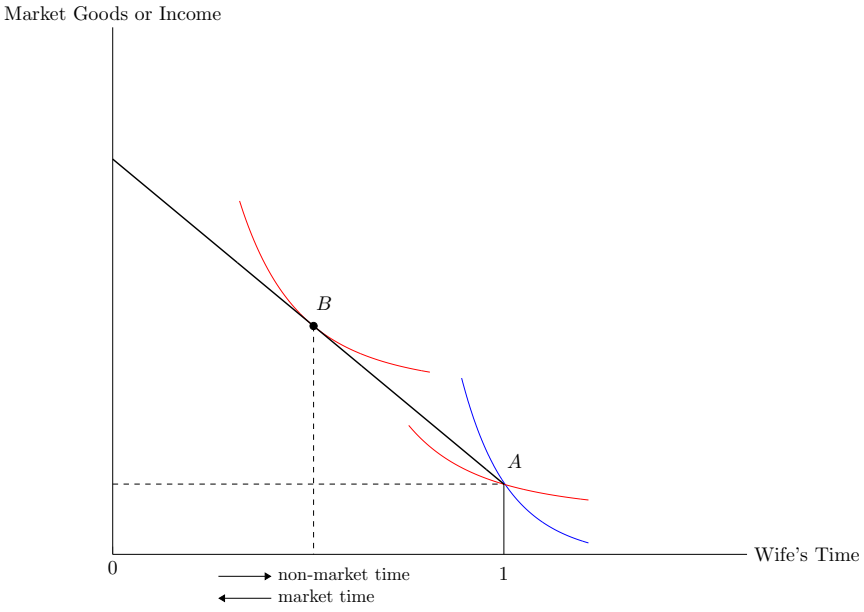
given by:

$$h_f^* = \frac{1 - \tilde{\theta}\eta \frac{w_m}{w_f} \bar{h}_m}{1 + \tilde{\theta}\eta}, \tag{3}$$

where $\tilde{\theta} = \frac{\theta}{1-\theta}$ is increasing in θ.

Figure 5 illustrates the optimal time allocation for two households with identical husband's earnings and wife's wage but heterogeneous preferences. Household A, characterized by the steeper indifference curve, has more conservative gender roles (higher η), a stronger taste for time-intensive commodities (higher θ), or a higher-earning husband (higher $w_m \bar{h}_m$). Household B, with flatter indifference curves, has more gender-equal norms, favors market-intensive consumption, or has a lower-earning husband. In household A the wife's reservation wage (i.e. the slope of the indifference curve in correspondence of full home specialization, $h_f = 0$) is larger than the wage rate (the slope of the budget constraint), hence she fully specializes in home production. In household B, the lower reservation wage implies that the wife is working in the market a strictly positive share of time h_f.

Figure 5: The Labor Supply Decisions of Married Women



In this stylized model, the comparative statics properties of the gender earnings ratio $\frac{w_f h_f^*}{w_m \bar{h}_m}$ reflect the role of wage components – productivity and the markdown – and optimal labor supply $h_f^*(w_f)$. Recalling $w_f = \phi p_f$ and $w_m = p_m$:

$$\frac{w_f h_f^*}{w_m \bar{h}_m} = \begin{cases} \frac{\phi \frac{p_f}{p_m} \bar{h}_m^{-1} - \tilde{\theta}\eta}{1 + \tilde{\theta}\eta}, & \text{for } \phi p_f \geq \tilde{\theta}\eta p_m \bar{h}_m \\ 0, & \text{for } \phi p_f < \tilde{\theta}\eta p_m \bar{h}_m \end{cases} \tag{4}$$

Expression (4) reflects wage and labor supply contributions to the gender earnings' gap, high-

lighting intensive and extensive margins. Higher female productivity p_f and/or more competitive wage setting (lower ϕ) increase both the probability that the wife works in the market and the earnings ratio for those employed. Preferences for time-intensive consumption and conservative gender norms ($\tilde{\theta}\eta$) and income effects ($p_m\bar{h}_m$) push in the opposite direction. An increase in overall productivity that leaves the gender ratio p_f/p_m unchanged does not impact the gender earnings gap. This follows from the assumption of Cobb-Douglas preference with income and substitution effect canceling each other out – an assumption that can easily be relaxed.

This simple framework is versatile and can be used to think about the role of children, the evolution of gender norms, or technical change. As children are an especially time-intensive component of the households' public consumption, childbirth can be interpreted as an increase in θ, causing a decline in the earnings ratio. In addition, the career cost of children for mothers (discussed extensively in Sections 4.2 and 5) rises with gendered norms (higher η) and father's earnings potential, including the long-hour culture in male-dominated jobs ($\bar{h}_m$). Although the framework is static, the loss in labor market experience due to work interruptions can lead to a decline in latent productivity p_f, as well as additional constraints on acceptable job opportunities, leading to more monopsonistic labor markets (lower ϕ). Also, labor supply choices can be easily discretized by restricting work schedules to either full- or part-time ($h_f = \{0, \bar{h}_L, \bar{h}_H\}$, $\bar{h}_L < \bar{h}_H$). This modeling can capture features of occupational choice, whenever occupations differ in time demands.

New technologies can affect relative earnings via both time-saving appliances in the household (Greenwood et al., 2005), lowering θ, and female-friendly technological progress (Heathcote et al., 2010), raising p_f/p_m.[5] The resulting increase in the wage ratio w_f/w_m has a larger impact on relative earnings for household with flatter indifference curves, who are more responsive to economic incentives due to larger substitution effects relative to income effects.

3.1.1 Modeling Gender Norms and Beliefs

While this framework illustrates the influence of gendered norms on the extensive and intensive margins of labor supply, it is important to recognize that gender norms themselves may be endogenous to female labor supply outcomes via a variety of transmission processes within and across generations, as will be documented extensively in Section 6. Gender biases in social norms may be eroded by exposure to working women via role models, peer influences and learning (see

[5] An important dimension of the rise in relative female productivity relates to the expansion of the service economy, which is more female-intensive than manufacturing, see Ngai and Petrongolo (2017) and references therein.

Fernández 2013, and references therein). Here, we model the bilateral interplay between norms and female outcomes in a simplified version of our model that focuses on the extensive margin of labor supply, in which women either work fulltime ($h_f = \bar{h}_f$), or fully specialize in the home ($h_f = 0$). As above, men have a fixed workweek $\bar{h}_m$.

We let norms vary across households. In particular, norms of household i are summarised in η_i, which is distributed according to $F(\eta)$. The maximization problem of household i becomes:

$$\max_{h_f \in 0, \bar{h}_f} \theta \ln(w_f h_f + w_m \bar{h}_m) + (1-\theta)\left[\eta_i \ln(1-h_f) + (1-\eta_i)\ln(1-\bar{h}_m)\right], \tag{5}$$

with women working the fixed amount $\bar{h}_f$ if

$$\theta \ln(w_f \bar{h}_f + w_m \bar{h}_m) + (1-\theta)\eta_i \ln(1-\bar{h}_f) \geq \theta \ln(w_m \bar{h}_m), \tag{6}$$

and non participating otherwise. Let's define η^* as the norms of the marginal household, who is indifferent between the case in which the wife participates to the labor market and the case in which she fully specializes in home production. Based on condition (6),

$$\eta^* = \tilde{\theta} \ln\left(\frac{w_m \bar{h}_m}{w_f \bar{h}_f + w_m \bar{h}_m}\right) \frac{1}{\ln(1-\bar{h}_f)} \tag{7}$$

In households with $\eta < \eta^*$ the wife works in the market, whereas in households with $\eta \geq \eta^*$ she only works in the home. Given the distribution of norms, female labor force participation is given by $P = F(\eta^*)$. The comparative statics on female participation encompass the same factors as in Section 3.1, which are now captured by the summary statistics η^*.

We next endogenize norms by letting η_i vary with female labor force paticipation, $\eta_i = \eta_{0i} - \eta_1 P$, where the parameter $\eta_1 > 0$ is constant across households, while η_{0i} is distributed according to F. The marginal household is now characterized by

$$\eta_0^* = \tilde{\theta} \ln\left(\frac{w_m \bar{h}_m}{w_f \bar{h}_f + w_m \bar{h}_m}\right) \frac{1}{\ln(1-\bar{h}_f)} + \eta_1 P \tag{8}$$

The resulting participation rate is then found as the fixed point solution to $P = F(\eta_0^*(P))$, which potential leads to multiple equilibria and coordination mechanisms, as in models by Fernández (2011) and Hazan and Maoz (2002).

4 Evolving Perspectives on Gender Inequality

The framework above is useful to highlight several channels leading to gender gaps in earnings. With gender convergence in human capital and productivity, the literature on gender inequality has coalesced around the study of gender differences in preferences and constraints, imperfectly

competitive wage setting, as well as the understanding of gendered norms.

4.1 Preferences, Traits, and Constraints

Over the last decade, research has made significant inroads in understanding the separate roles of preferences and constraints in driving gender gaps. As a large portion of the remaining gaps in earnings is explained by differences in the pay and attributes of the jobs that men and women perform on average, it is important to establish whether gender differences in the job allocation reflect differential preferences for job attributes and/or differential skills in those jobs, versus differential barriers to entry into certain careers or the labor market as a whole. Naturally, a key challenge to making this distinction is that observed gender differences in skills, traits, or preferences could themselves be endogenous to constraints in the form of norms, stereotypes, and discrimination.

Building on seminal experimental work discussed in Croson and Gneezy (2009) and Bertrand (2011), research on gender differences in preferences and psychological attributes has continued to expand around traits like risk-aversion, self-confidence, competitiveness, willingness to negotiate and ask, as well as other-regarding preferences. These traits are relevant for the choice to enter prestigious and financially rewarding careers, which often develop in competitive and risky environments. There are clear hurdles to estimating the causal impact of psychological traits on labor market outcomes. One challenge is about measurement, as one would ideally need to measure those individual traits before they may be contaminated by the outcomes of interest. Another challenge is about the distinction between direct effects, which affect the performance of an individual on a given job, and indirect effects, which shape human capital investments and labor supply choices. Blau and Kahn (2017) draw important lessons on these questions from a small number of studies that relate psychological traits to gender pay gaps. Overall, available results suggest that psychological factors account for a modest portion of both the raw or the adjusted wage gap for individual and job characteristics. However, a few studies suggest that even similar traits may feed into gaps in outcomes when they are regarded and rewarded differently depending on whether they are displayed by a man or a woman.

Importantly, recent studies in psychology have shown that mean gender differences in many individual traits are small relative to their variation within each gender. Hyde (2005) pools results from meta analyses on gender differences in several cognitive and non-cognitive skills, communication, personality traits, well-being, and moral reasoning. For 78% of the 124 characteristics assessed, there is a sufficiently large overlap between the male and female distributions to conclude that men and women are more alike than they are different in many relevant traits

(see also the discussions by Hyde 2014 and Bertrand 2020). Despite this evidence, gender differences are often exacerbated in the perceptions of economists. For example, in the study of Bandiera et al. (2022), over three quarters of economists surveyed believe that women are on average under-confident, while men are on average overconfident. By contrast, a meta-analysis of experimental results in economics reveals that both men and women are on average over-confident, and a Bayesian hierarchical model that aggregates available estimates cannot reject the hypothesis that they are equally over-confident. In addition, the estimated pooling factor across studies is low, implying that each study contains limited information over a common phenomenon. The discordance between perceptions and empirical results may be reconciled if economists overestimate the pooling factor across available estimates, or have priors that are both biased and precise.

The gender similarity hypothesis of Hyde (2005) acknowledges clear exceptions in a few domains. Men perform better on average on measures of motor skills, behave differently in some measures of sexuality, and are more likely to be physically aggressive. While it may be tempting to hypothesize that these dimensions do not directly shape labor market success, recent work has documented important consequences of sexual harassment and violence against women in general on the economic outcomes of victims, perpetrators, and their workplaces. Understandably, these themes have attracted increasing attention among economists since the #MeToo movement has made salient the pervasiveness of sexual harassment at work and its personal and professional costs for victims.

Folke and Rickne (2022) provide a novel, comprehensive study of sexual harassment in workplaces in Sweden and its effects on gender inequality in the labor market at large. In nationally representative survey data, women are three times more likely than men to report sexual harassment over the past year (12.6% versus 4.2%) and, for both men and women, harassment risk rises markedly with the share of opposite-gender co-workers. As harassment victims are more likely to move employer, victimization leads women to quit male-dominated firms, which also happen to be high-wage firms, and viceversa for men. Harassment-related mobility hence exacerbates sex segregation and pay inequality, explaining about 10% of the gender wage gap.

Using data on police reports in Finland, Adams-Prassl et al. (2024) link cases of violence between co-workers to the economic outcomes of suspect perpetrators (84% of whom are male) and victims (evenly split between male and female). Violence at work drives sudden and persistent employment losses for both parties, with starkly asymmetric effects between cases of male-on-male and male-on-female violence. While male victims experience smaller negative

repercussions than their male assailants, female victims bear a *larger* economic penalty than their male assailants. Importantly, following violence against women at work, incumbent women are more likely to leave the firm, and fewer women are hired in the medium term. These patterns are concentrated in male-managed firms, while in female-led firms perpetrators experience similar employment losses as their victims. The economic costs of assaults for women are not limited to workplace violence. Bindler and Ketel (2022) find large and persistent earning losses among women who experience intimate partner violence and Adams et al. (forthcoming) document detrimental employment and earning effects of cohabiting with men who are ever reported for intimate-partner violence. Their results suggest that economic coercion is a central component of abusive relationships, even before a partner is reported for physical violence. One important lesson from this literature is that gender differences in traits such as sexual abuse or violence may translates into a barrier to women's economic success.

Recent perspectives on barriers to women's labor market involvement have produced major advances in economists' understanding of gender gaps. The first key advance consisted in acknowledging that differential gender opportunities and barriers naturally lead to questions of allocative efficiency. Starting from the premise that the distribution of innate talent does not systematically vary by gender, the under-representation of women in certain professions implies that female talent is not efficiently allocated in the economy. Indeed, Hsieh et al. (2019) estimate that between 20% and 40% of growth in GDP per capita in the US over the past half a century can be explained by the improved allocation of talent, thanks to improved access to education and declining occupational segregation for women and black men.[6]

Consistent with this narrative, one should expect productivity gains from hiring more women in male dominated contexts, in which women are likely to be positively selected. Using personnel records from a multinational firm, Ashraf et al. (2024) show that the performance of female employees within the organization is higher in countries where women are underrepresented in the candidate pool. These tend to be countries in which predominant gender norms discourage women's participation to the labor market as a whole. Similarly, Chiplunkar and Goldberg (2024) and Mertz et al. (2024) find evidence of improved firm performance when women face lower entry barriers in entrepreneurship in India and Denmark, respectively.

An important, symmetric question is whether men's under-representation in certain female-dominated professions implies that their talent is not efficiently allocated. Delfino (2024) shows that attracting male applicants into the UK social care sector – in which the share of female

[6]Using a similar framework in an international context, Chiplunkar and Kleineberg (2024) estimate that the reductions in gender-specific wedges in employment and remuneration between 1970 and 2015 account for around a third of labor reallocation towards manufacturing and services in six large countries.

employees hovers around 80% – improves the selection of male talent. Schaede and Mankki (2024) find and that lifting a 40% male hiring quota from the Finnish education sector in the late 1980s led to higher female concentration in the sector and lower attainment among pupils. Evidence suggests that the diversity quota achieved a more efficient allocation of talent than the unconstrained selection process that followed, as this seemed to penalize valuable traits and skills among the under-represented group.

While these studies provide evidence of productivity gains from the entry of men and women into contexts where they are under-represented, it is hard to draw conclusions on aggregate welfare from analyses of specific sectors, without a symmetric analysis of gains and losses in the respective feeder sectors. By considering job allocation across the whole economy, work by Hsieh et al. (2019) is an important exception. However, even in their analysis the household sector is not explicitly modeled. A fuller understanding of the welfare consequences of a more equitable allocation of talent would require a general equilibrium perspective that considers both genders' comparative advantage in the labor market and the home.

The second advance consisted in pushing the research frontier on the understanding of the nature and sources of the main entry barriers to the labor market or to specific professions. Women's primary role of child-bearers and carers is typically emphasized as one key hurdle to their continued participation and especially to their entry and retention into highly-paid but time-demanding careers. We discuss below the main approaches and findings from the literature on career-family trade-offs.

4.2 Career-Family Trade-offs

While female labor supply and fertility are deeply intertwined, much of the early work has dealt with each issue in isolation. Since at least Becker (1960), several authors have studied fertility in static or life-cycle settings, treating labor supply decisions as given. Conversely, the early labor literature typically focused on female participation, treating fertility as exogenous (see, for example, Heckman and Macurdy 1980). Seminal work on the joint labour supply and fertility decisions of women by Moffitt (1984) has modeled, in a dynamic setting, the simultaneous evolution of wages, labor force participation, and fertility, allowing for correlated shocks to fertility and participation. In his model, the detrimental effect of children on mothers' participation and wages reflects both the time involved in raising children and the loss of actual labor market experience.

Francesconi (2002) introduces the intensive margin of labour supply in joint dynamic, structural models of participation and fertility. He considers part-time employment as an alternative

to labour market breaks when the disutility of work increases during childbearing years. However, the model estimates imply that part-time employment hardly cushions maternal earnings in the long-run relative to career breaks, as returns to part-time work experience appear to be substantially lower than the returns to full-time experience. In particular, the convex relationship between returns to experience and working time suggests that part-time and full-time jobs differ systematically beyond the length of the typical workweek, and most notably in the types of occupations typically available on a full-time or part-time basis.

Adda et al. (2017) propose a natural modelling of the career costs of children, subsumed in occupational choice. Occupations capture the bulk of gender inequality in earnings, as only a small portion of the remaining gender gap in contemporary data is explained by unequal pay for equal work. If the choice of occupation is a key factor underlying diverging career paths for men and women, especially after parenthood, it is important to understand the drivers of such choices and the main features of occupations sought out by women with children, and those who intend to have them in the future. Adda et al. (2017) incorporate occupational choices in a dynamic life-cycle model of participation, fertility, and asset accumulation where occupations differ in their wage profiles, the speed of skill depreciation associated to career breaks, as well as their family friendliness. Estimating their model on men and women completing apprenticeships in Germany, the authors find that abstract occupations have relatively high returns to experience, high penalties for career breaks, and poor amenity value once women have children. This implies that the interplay between fertility choices and career concerns are therefore far more relevant in abstract than routine occupations (with manual occupations faring somewhere in the middle). Based on their model estimates, the authors conclude that about three quarters of the career costs of children stem from reduced or intermittent participation, with the rest being explained by occupational choices, skill depreciation, and a reduction in working hours.

By interacting career and fertility decisions over the lifecycle, an important feature of Adda et al.'s model is that fertility plans are allowed to shape women's human capital and occupational choices ahead of childbirth. However, the authors estimate that the anticipation effects of motherhood are relatively small. For example, the choice of apprenticeship track during teenage years by women who intend to have children explains about 5% of the lifetime cost of fertility, and the earnings gap with respect to men only starts to build up for women who intend to have children around age 26, just before the average age at first birth. These results are consistent with survey evidence that women systematically underestimate the impacts of prospective fertility on their labor market involvement (Kuziemko et al., 2018).

Another strand of work has addressed the potential endogeneity of fertility and its timing

by using instruments for the number of children in female labor supply equations, such as twin births (Rosenzweig and Wolpin 1980; Bronars and Grogger 1994) and sibling sex composition (Angrist and Evans, 1998). These instrumental variable (IV) estimates typically deliver negative impacts of fertility on maternal labor supply, although these tend to be relatively short-lived and smaller than those obtained from OLS.

A drawback of these early papers is that the fertility impacts are limited to the arrival of a second or third child, and therefore miss the role of the extensive margin of fertility. Later work leverages (in)fertility shocks to investigate differential labor supply outcomes between mothers and childless women (see, among others, Hotz et al. 2005; Lundborg et al. 2017; Gallen et al. 2023; Bögl et al. 2024). In particular, by comparing women who conceive through in-vitro fertilization (IVF) in Denmark to those who attempt to conceive through IVF but fail, Lundborg et al. (2017) detect large impacts of fertility on maternal earnings in the short run, with much smaller impacts beyond a child's second birthday. Bögl et al. (2024) obtain similar results for Norway, by comparing women who have a life birth after their first medically-assisted conception to those who miscarry. It is important to note in these comparisons that the childless (control) group is made of women who experience failure in their struggle against infertility, as Bögl et al. (2024) find that women who miscarry after their first medically-assisted conception are significantly more likely to take mental health medication than those who have a live birth. The interpretation is that both the arrival of children and the mental health toll of a miscarriage have detrimental impacts on earnings, thus the comparison between treatment and control groups may understate the overall impact of fertility on earnings. Unlike Bögl et al. (2024), Lundborg et al. (2017) find negligible impacts of infertility on the incidence of depression in Denmark.

The internal validity of the IV approach requires the probability of success of fertility treatments to be orthogonal to earning trajectories. This point has been questioned by Groes et al. (2024), who find that college-educated women in Denmark have a 9% higher live birth chance upon IVF than high school-educated women, and 25% higher chances than high-school dropouts. The external validity of local average treatment effects obtained on women who opt for IVF treatment crucially relies on the representativeness of this selected sample.

To capture the overall treatment effect of fertility, the past decade has seen a proliferation of event-study evidence on the career costs of childbirth. This approach leverages sharp changes in outcomes around first childbirth for mothers relative to fathers. The fundamental assumption that the timing of fertility is independent of counterfactual outcomes is typically motivated by the occurrence of sharp breaks in career trajectories upon birth, without major anticipatory effects. The wide consensus from this body of work is that, while childbirth is roughly neutral

for men's labor market trajectories, it drives a sudden and largely persistent setback in women's earnings. Angelov et al. (2016) estimate that Swedish couples experience a widening of about 30 percentage points in the spousal gap in earnings during the first 15 years of parenthood. Kleven et al. (2019a) estimate a long-run "child penalty" in Denmark of about 20%: this measures the extent to which female earnings fall relative to male earnings due to childbirth, encompassing reduced maternal participation, reduced hours for mothers who participate, and lower hourly wages.[7] Importantly, the child penalty in Denmark has hovered around 20% since the 1980s, against a backdrop of rapidly declining gender gaps in human capital as well as unexplained gaps. Therefore, while in the 1980s child-related inequality was explaining about 40% of the gender gaps in earnings, its role had doubled by 2013. Research on additional countries has revealed similar patterns, with some variation in magnitudes: between five and ten years into parenthood, women's earnings typically fall behind men's earnings by 20%-25% in Denmark and Sweden, 30%-40% in the US and the UK, and up to 50%-60% in Germany, Austria and Italy (Kleven et al., 2019b; Casarico and Lattanzio, 2023).

While the event-study approach of Kleven et al. (2019a) requires high-quality panel data, Kleven et al. (2024) show that results from this approach can be closely replicated on cross-sectional data organised as a pseudo-panel, effectively extending the feasibility of child penalty estimates to most countries around the world. This requires building pre-childbirth employment histories for parents, based on employment outcomes of childless individuals with matching characteristics. An interesting finding from the child penalty "atlas" of Kleven et al. (2024) is that female employment losses associated with marriage and childbirth are negligible in countries with very low levels of GDP per head, then rise at intermediate levels of development, before starting to fall again towards the top of the country ranking. Using twin birth and same gender instruments for incremental fertility, Aaronson et al. (2020) document similar patterns on a large cross-country panel spanning over two centuries.

These trends clearly correlate with various dimensions of structural transformation. In predominantly agricultural societies, most women work flexibly on or near the household premises, and their work is compatible with marriage and childcare. The transition towards industrialization and the service economy, in tandem with urbanization and the de-localization of work, drives progressively larger child-related gaps in employment, as childcare requires some degree of specialization. At highest income levels, economies can create family-friendly jobs that ease the combination of families and careers. The hump-shape pattern in the family penalty mirrors the U-shape pattern in female employment emphasized by Goldin (1990) and Ngai et al. (2024),

[7] Comparable life-cycle evidence has been shown in Bertrand et al. (2010) and Goldin and Mitchell (2017), among others.

among others.[8]

The IVF-based IV approach and the event-study approach recover conceptually different treatment effects of fertility based on different identifying assumptions. Event studies are centered around the time of first birth and identify dynamic treatment effects of fertility by comparing the earning trajectories of women who give birth to those of women of the same age who give birth at different ages. In doing this, they assume exogenous birth events with respect to counterfactual career outcomes (conditional on included controls) and smooth counterfactual outcomes around childbirth.[9] The IV-IVF approach is centered around the time of the first IVF attempt and identifies treatment effect on compliers, i.e. those who conceive at the first attempt. This requires assuming that IVF success is orthogonal to career outcomes and it only affects outcomes via fertility. However, many women who initially fail to conceive through IVF become mothers later, via IVF or otherwise. Estimated treatment effects of fertility would thus be downward biased by delayed fertility behavior.

Besnes et al. (2023) combine both approaches using data on Norwegian women undergoing IVF treatment and their partners. To address biases related to delayed fertility, they estimate an event-study model centered around first birth and, to address concerns of endogenous timing of birth, they capture a woman's intention to conceive by controlling flexibly for time since the first IVF treatment. Their results show a 23% widening of the parental gap in earnings after birth, shrinking to 13% in the long-run (mostly driven by a fertility premium for partners). This long-run penalty is smaller than the 18% estimate obtained with the conventional event-study approach and larger than the 4.8% IVF-based IV estimate. This is consistent with both the role of endogenous birth timing, if women tend to time fertility when their earning profiles flatten, and the a downward bias induced by delayed fertility in IV estimates.

Most recent contributions in this literature highlight additional interesting patterns in child penalties. Adams et al. (2024) find that a sizable portion of the child penalty in Denmark is explained by spells of parental leave, when mothers are not working or earning a salary but are entitled to return to their pre-birth job and pay within their leave entitlement. This finding stresses the importance of distinguishing between "incapacitation" effects of parental leave, which are typically incurred soon after each birth, and longer-term impacts that may happen via the loss of actual work experience and adjustments in labor supply at intensive or

[8]The relationship between marriage and (the timing of) fertility has evolved over time and varies across countries. Papers that separately identify the two channels find that, conditional on fertility, marriage penalties rapidly decline with levels of development, and that the whole "family" penalty is accounted for by the presence of children among recent cohorts of parents in high-income countries (Kleven et al., 2024; Juhn and McCue, 2017; Albanesi et al., 2023).

[9]The smoothness assumption is not sufficient for identification of long-run child penalties, as it would be necessary to assume that women who give birth at very different ages provide valid control groups for each other.

extensive margins. Kuka and Shenhav (2024) document the important role played by loss of actual experience during career breaks among single mothers in the US. In particular, those who were exposed to work incentives immediately after birth rather than 3-6 years later, accumulate 0.62 additional years of experience and have 4.2% higher earnings conditional on working. These results suggest that work experience soon after birth may be rewarded with steeper returns. We will expand on detected patterns of labor supply adjustment in Sections and .

Finally, most of the literature on child penalties emphasizes changes maternal labor market outcomes, but what happens to men who have children, compared to those who do not? A long standing literature has detected marriage and fatherhood premia for men in the US, whether in cross-sectional or within-group estimates (see for example the discussion in Juhn and McCue, 2017). Fatherhood may shape wages through employer perceptions and possibly (positive) discrimination. Indeed, Korenman and Neumark (1991) find that the earnings profile of men steepen after marriage, to some extent thanks to more favorable rating by their managers. Similarly, Correll et al. (2007) find that fathers tend to be evaluated more positively than non-fathers, while the opposite happens to mothers, despite equivalent qualifications. In addition, men may respond to societal pressures linked to the breadwinner model by working longer and harder. For instance, Killewald (2013) finds that the fatherhood premium is largest among residential, married, biological fathers, who might feel greater incentives to improve their children's well-being, compared to stepfathers or non-residential fathers. Lundberg and Rose (2000) find a substantial reallocation of time and effort for married couples associated with the arrival of children. Following the birth of the first child, the father's wage increase by 7% in households where the mother is continuously employed, and by 11% in households where the mother has a career break. More recently, Goldin et al. (2024) find that fathers earn a wage premium that cannot be fully explained by selection into fatherhood (i.e., higher-ability or harder-working men being more likely to become fathers.) Similar results obtained by Besnes et al. (2023) using the IVF-based IV tend to exclude that fatherhood premia simply reflect endogenous fertility around men's earning growth. Goldin et al. (2024) also note that fatherhood premia in the US are larger among college graduates, and especially for men working in occupations that require long and/or inflexible hours. This evidence is consistent with progressive specialization of men and women in paid and unpaid work, respectively, once they become parents.

While available approaches differ on assumptions and strengths and weaknesses, consensus is that parenthood drives widening gaps in parental earnings, and the study of the anatomy and drivers of the child penalty is currently one of the most actively researched areas of gender inequality.

5 The Anatomy of the Career Costs of Motherhood

5.1 Gender Biology and Productivity

First-order questions on the drivers of child penalties are whether they reflect biological components of women's caring responsibilities, as opposed to acquired patterns of specialization, and to what extent they result from productivity differentials, as opposed to larger markdowns of wages below productivity for women after they become mothers.

As pregnancy, birth and breastfeeding may set limits on women's labor market involvement, Kleven et al. (2021) investigate the role of these factors by comparing earnings penalties for biological and adoptive mothers in Denmark. Similarly as for biological parents, earnings trajectories for adoptive parents evolve in parallel before adoption, and diverge persistently afterwards. Short-run penalties are smaller in adoptive than biological families, but long-run penalties are very similar. Andresen and Nix (2022) leverage additional evidence from same-sex female couples in Norway, as well as heterosexual adoptive couples. While heterosexual couples – whether biological or adoptive – experience similar setbacks in earnings for mothers and virtually no drop for fathers, same sex couples share the cost of children much more evenly, with a somewhat larger drop for the biological mother in the short-run, but virtually no difference between the biological mother and her partner in the long-run. These pieces of evidence establish that maternal biology is unlikely to drive persistent drops in earnings, although it plays a modest role within a couple of years from birth.

Estimates of gender differences in productivity are scant. Seminal estimates are from contexts in which productivity is easily measurable. Azmat and Ferrer (2017) find that male lawyers bill 10% more hours and bring in more than twice as much new client revenue as female lawyers. Much of this gap is explained by the presence of young children and differential aspirations to become a partner in the firm. Cook et al. (2020) estimate that male drivers earn on average 7% more than female drivers on the Uber rideshare platform. This differential reflects men's higher willingness to drive in more lucrative locations (with higher crime and more drinking establishments), their sector-specific human capital (as they typically accumulate more job experience), and their higher driving speed.

Gallen (2023) investigates gender differences in productivity in six large private sector industries in Denmark. Her estimates leverage variation in value added across firms employing different proportions of female employees, conditional on human capital, hours worked, and detailed occupation. She finds that wage gaps between mothers and men approximately reflect underlying productivity differences, although part of the productivity gap is driven by

some gradual reallocation of women into lower-TFP firms once they have children. The fact that mother's pay is on average aligned with their relative productivity excludes (observable) discriminatory pay differences for equal work, although it may not explain sorting across occupations or employers, something that we will discuss in the next Section. Interestingly, Gallen (2023) documents evidence of uncompensated productivity premia for childless women, especially during their prime child-bearing years, possibly consistent with a statistical discrimination channel: if employers cannot reduce wages when women have children, they may offer lower wages to childless women in anticipation of motherhood.

For those working from home (WFH), the presence of children may directly impact productivity via work patterns. Adams-Prassl et al. (2023) find that that mothers working for the online MTurk platform are more likely to interrupt their time on the platform, with consequences for the speed of completing tasks. Ho et al. (2024) shows similar findings on women in India who are offered the opportunity to WFH and multitask work with childcare. In both cases, piece-rate compensation implies that efficiency costs are borne by workers. However, efficiency losses may discourage firms from offering WFH under typical time-rate compensation.

5.2 Differential Job Sorting and the Organization of Work

A large body of work has explored the differential job sorting of mothers and fathers. For example, Kleven et al. (2019a) estimate that, soon after childbirth, working mothers tend to fall behind in the occupational ladder with respect to fathers, and are less likely to hold managerial roles. They are also more likely to move to the public sector and to firms led by female managers with children suggesting the pursuit of family-friendly working conditions at the expense of higher pay. In the presence of gender differences in preferences for working conditions, models of compensating differentials (e.g., Rosen, 1986) imply that women are willing to accept lower earnings in exchange for desirable job amenities that are costly for employers to provide. This view places special emphasis on the role of the organization of work in shaping gender gaps.

Goldin (2014a) argues that a major source of the remaining pay disparities, especially among highly-educated (and equally qualified) men and women is the fact that many of the highest paying occupations are also those that disproportionately reward individuals who are willing to work long (and particular) hours. As women tend to work fewer hours, they tend to suffer greater earnings penalties relative to men in such occupations. Indeed, she documents that occupations that exhibit the greatest convexity of pay with respect to time worked also have the largest gender earnings gaps. The remuneration of family-unfriendly work schedules is particularly prevalent in the corporate, financial, and legal sectors, suggesting that such organizational

practices are likely to be a key factor behind the substantial gender pay gaps that emerge over the lifecycle in these professions, especially with the arrival of children (Bertrand et al., 2010; Noonan et al., 2005; Azmat and Ferrer, 2017).

Building on these observations, Cortés and Pan (2019) show that relaxing the work hours constraint faced by highly-educated women, through the increase in the availability of low-cost and flexible household services in the form of low-skilled immigrant labor, increases the relative earnings of women in occupations that reward overwork. Moreover, in cities with greater inflows of low-skilled immigration, women are more likely to be found in higher quantiles of the male wage distribution, and young women are more likely to enter occupations with higher returns to overwork. Focusing on the medical profession, Wasserman (2022) shows that a policy that directly reduced a job's time requirements affected women's propensity to enter the job and the gender wage gap. Using data on the universe of US medical school graduates, and exploiting a 2003 policy that capped the average workweek for medical residents at 80 hours, she finds that medical specialties that experienced larger declines in weekly hours attracted more women, against roughly unchanged numbers of men. A back-of-the-envelope calculation reveals that the entry of women into high-compensation specialties due to the reform potentially closed the physician gender wage gap by 11%.

Differences in "flexibility penalties" across occupations suggest that organizational changes may offer a promising solution to addressing gender pay gaps. Goldin (2014a) offers several examples of occupations and sectors such as obstetricians, pharmacists, and veterinarians that have moved toward greater hours flexibility by increasing substitutibility among employees. Yet, our understanding of the precise sources of the returns to working long/inflexible hours remains limited. It is plausible that the organization of certain professions reflects, to a certain extent, long-term inertia. Some have suggested that the long-hour culture could arise due to signaling considerations in situations where actual productivity is hard to observe, and firms rely on work hours as a proxy for productivity (see Landers et al., 1996; Tô, 2024). Additional case studies and research that can further elucidate the sources of occupational differences in the returns to overtime/inflexible hours and shed light on how workplace practices can be changed (ideally with little or no productivity costs) would be especially promising.

The surge in working from home (WFH) – especially in hybrid format – after the COVID-19 pandemic has provided economists with an unprecedented testing ground for investigating its benefits to employers and employees, but evidence on gendered impacts is thin, at least in the short-run. Evidence from the WFH experiment of Bloom et al. (2022) has shown that the introduction of hybrid work in a global travel-agent head-quartered in Shanghai had no direct

impacts on measured performance, but led to 33% lower quits and higher employee satisfaction. Interestingly, women were disproportionately less likely to quit their jobs, relative to men, if given the opportunity to WFH. However, they were less likely than men to volunteer for the WFH experiment and ex-post take-up rates of WFH were very similar across genders. This apparent paradox could be possibly explained by gender differences in concerns over the career costs of signalling a preference for remote work. In addition, women opting for WFH may deepen gender roles within their households by increasing their availability for home-based duties.

While results from this body of evidence are consistent with compensating differentials associated to family-friendly working conditions, in practice it is not easy to infer workers' valuation of job amenities from observational data on job choices since the observed relationships between earnings and specific job attributes tend to be confounded with unobserved worker characteristics and job attributes. To sidestep these issues, researchers have turned to the use of hypothetical job choice experiments to estimate individual preferences for workplace attributes.

In these experiments, respondents are asked to choose which job they prefer (out of two or three job offers) from a series of hypothetical scenarios that are constructed to reflect a realistic menu of potential job offers that vary in earnings and other job characteristics (e.g., workweek length, hours flexibility, the option to work part-time, etc.). Job characteristics, including earnings, are randomly varied across job offers within each scenario. Individual preferences for each job attributes (or willingness to pay) is then measured in terms of the amount of earnings that respondents are willing to forego for a particular job attribute.

Using such an approach, Wiswall and Zafar (2018) elicit preferences over hypothetical job attributes among New York University undergraduates. They find that women express on average a much stronger preference for flexibility in working hours than men, with an implied willingness to pay (WTP) of 7.3% compared to 1.1% for men, while men have a higher WTP than women for higher earning growth. They also show that self-reported preferences for job attributes have a sizeable impact on major choice. Overall, the authors find that gender differences in preferences for these job attributes can explain as much as a quarter of the early-career gender gap in earnings. Relatedly, using a similar stated-preference appraoch, Maestas et al. (2023) document that women, in general, place a higher value than men on avoiding physically demanding work, paid time off, and the option to telecommute.

Mas and Pallais (2017) provide evidence on preferences for actual work arrangements, by introducing a discrete choice experiment in the application process for call center positions across the US. Applicants can express their preferences between a conventional 9-to-5, 5-day a

week, office job and alternative arrangements featuring flexible scheduling, working from home (WFH), or employer discretion over work schedules. Wages are randomized across these options. While the large majority of applicants do not value flexible scheduling, on average they value the opportunity of WFH and dislike employer discretion in scheduling. Women, especially those with young children, express a higher WTP for these job attributes than men. However, in their setting, as the incidence of these attributes is fairly similar for men and women, gender differences in the WTP for them cannot lead to sizeable gender gaps in pay, even under large compensating differentials.[10]

Recent work has also directly documented gender differences in job search strategies. Using administrative data on unemployed jobseekers in France, Le Barbanchon et al. (2021) document women's higher willingness to pay for shorter commutes. In particular, they estimate that gender gaps in reservation wages, post-unemployment wages, acceptable commutes and realized commutes all widen with age, and an important portion of the these gaps is related to the presence of children. By comparing acceptable job characteristics with realized outcomes, they estimate that women have a higher distaste for commute, leading them to trade-off a higher portion of potential earnings for being able to work closer to their homes. Model calibration for men and women with different household compositions predicts that gender gaps in the distaste for commuting explain around 10% of wage gaps.

Cortés et al. (2023) offer a novel perspective on how gender differences in risk preferences and beliefs affect the types of jobs that men and women choose to accept. Focusing on recent graduates from Boston University, they find that women have lower reservation wages on average, and as a consequence, they tend to accept their first job upon graduation sooner than men, albeit with lower entry wages than that of a comparable male. An important portion of the gender gap in reservation wages (and accepted wages) is accounted for by higher risk tolerance and over-optimism about job search prospects among men. While the focus of the this study is on young, mostly childless, individuals, gender differences in job search may be amplified by the presence of children and care responsibilities, whether current or in expectation. D'Angelis (2023) shows that due to their higher willingness to pay for the amenity, college-educated millennial women's search for employers that offer parental leave can contribute to the early-career growth of the gender wage gap, well before having children. Relatedly, Skandalis and Philippe (2024) estimate that jobless mothers make fewer job applications than women without children

[10]Other studies have also sought to infer WTP for job attributes using other approaches besides discrete choice experiments. Using a revealed preference approach, Felfe (2012) infers mother's WTP for job amenities from the response of maternity leave take-up to the characteristics of jobs they are returning to, and Hotz et al. (2018) estimate that mothers value workplaces with higher shares of female co-workers more favorably than fathers do, where co-worker composition is interpreted as a correlate to unobservable amenities.

because they are both more selective on acceptable job attributes and bear a higher opportunity cost of time spent on search.

5.3 Monopsonistic Labor Markets

Several of the mechanisms discussed can be interpreted through the lens of standard models of compensating differentials in perfectly competitive labor markets. In these models, wage differentials exactly compensate for the value of non-wage job attributes, such that different jobs provide the same level of utility to (equally productive) men and women.

At the same time, similar mechanisms can be exacerbated in monopsonistic labor markets, in which employers have significant market power in setting wages and working conditions, and gender differences in family-related constraints may provide employers with higher market power on female employees. Interestingly, one of the first explanations of gender gaps can be found in Robinson (1933)'s treaty on monopsony, where she notes that wage discrimination between equally productive men and women can arise whenever their "conditions of [labor] supply are different" (p. 302-304). Robinson (1933) builds her argument about gender differences in labor supply on a model in which men are organized in a trade union and women are not, but this argument can be easily generalized to the case in which men and women differ in their evaluation of non-wage job attributes.

The distinction between competitive models of compensating differentials and models of monopsonistic labor markets rests on the behavior of labor supply. In perfectly competitive models with heterogeneous working conditions, labor supply is infinitely elastic to utility differentials, hence utility is equalized across employers, and wages are unrelated to labor supply to the individual employer because they are fully compensated by non-wage attributes. In a monopsonistic labor market, labor supply is only imperfectly elastic to utility and utility differentials across jobs persist in equilibrium. In this case, variation in wages does predict labor supply to the individual employer, and the wage elasticity of labor supply is inversely related to employer market power and to the markdown of wages below the marginal product of labor. There is extensive evidence that all margins to labor supply significantly respond to wages (Manning, 2021; Sokolova and Sorensen, 2021), in support of the idea that labor markets are imperfectly competitive because employers have considerable monopsony power over workers.

In the household model of Section 3, we have posited that women possibly face monopsonistic labor markets (with $1-\phi > 0$ denoting the wage markdown), while men are paid their marginal product. In a more general scenario, both genders may be paid below their marginal product, but women (especially mothers) face larger markdowns than men because their labor supply is

less elastic to a firm's wage. Manning (2003, ch. 7) contains early evidence on gender differentials in labor market transitions. In particular, women with children in the UK are more likely than any other demographic group to report that family commitments hinder their job search and prevent them from moving jobs. Conditional on moving jobs, wage returns tend to be lower for women than for men, but gains in terms of non-pecuniary factors are higher.[11] While Manning (2003) does not detect clear-cut evidence of gender differentials in the elasticity of job separations to the wage in the UK, Barth and Dale-Olsen (2009) finds that women's job separation in Norway are less responsive than men's separations to firm-level wage premia.[12]

As highlighted by Sokolova and Sorensen (2021) and Caldwell et al. (2024), one of the main challenges in estimating labor supply elasticities is identifying credible variation in wages, i.e. cases of exogenous wage changes that would not involve an endogenous adjustment of job amenities, recruitment effort or selectivity. The growing availability of field experiments and matched worker-firm data has much improved the reliability of elasticity estimates, although evidence on gender differences is to date scant.

In the experimental approach, Caldwell and Oehlsen (2023) offer a random sample of Uber drivers an earning premium of 10-50% per trip for a week. Some of these drivers also have access to the competitor drive-share platform Lyft, providing variation in outside options. Their result suggest that women's labor supply is not less elastic to the firm than men's, and their labor supply to the market as a whole is more elastic. While these results imply that employers in the gig-economy do not have incentives to pay women below men, other factors may play a role in less-flexible set-ups.

Sharma (2024) investigates gender differences in labor supply elasticity in Brazilian manufacturing sector. She leverages firm-specific demand shocks, represented by the end of the Multi-Fiber Agreement in 2005, which lifted export quotas on very specific textile products from China to several high-income countries, and concurrently caused a 20% fall of Brazilian exports of these products. The MFA expiry caused an equivalent decline of male and female wages in China-competing firms. However, men were substantially more likely to leave those firms than women, and their wages eventually recovered, while women's wages remained persistently lower. Differential separation elasticities would drive a 18% gender wage gap among equally productive workers, explained in roughly equal proportions by women's stronger idiosyncratic preferences for their current employer and the higher concentration of their outside options.

[11] See also Petrongolo and Ronchi (2020) for evidence of differential gender gains in terms of geographic proximity to work

[12] Qualitatively similar results are shown by Hirsch et al. (2010); Ransom and Sims (2010); Webber (2016).

The renewed interest in the consequences of monopsonistic labor markets for (gender) inequality has naturally called for direct evidence on the role played by firms. Firm-specific pay premia contribute to the gender wage gap whenever women sort into lower-paying firms and/or appropriate a smaller share of the firm-specific surplus than men. Card et al. (2015) quantify these channels by introducing gender-specific wage premia in the two-way fixed-effects framework of Abowd et al. (1999). Using matched employer-employee data for Portugal, they find that differential sorting and rent sharing mechanisms jointly explain about one fifth of the gender wage gap. Morchio and Moser (2023) propose microfoundations for worker sorting and wage setting in the Card et al. (2015) framework, based on a combination of compensating differentials, taste-based discrimination, and monopsony power. The key to identify the role of these components on matched employer-employee data for Brazil is a revealed-preference interpretation of worker flows. By comparing gender-specific utility at each firm to firm-level pay, they recover the gender-specific amenity values at each firm. Their results indicate that compensating differentials explain the bulk of gender wage gaps, implying that higher-ranked employers for men mostly offer higher wages, while for women they mostly offer better amenities. By contrast, the utility differentials associated to job sorting appear to be small.

Some papers in this stream aim to direct identify the role of family-friendly working conditions as "productive" amenities for employers. Goldin et al. (2020) posit that firms have an incentive to offer paid parental leave to their employees whenever they invest sufficiently in firm-specific human capital, whose rewards attract them back at work at the end of their leave. Indeed, firms that provide paid leave in the US tend to be larger, with relatively younger workforces, operating in industries with higher incidence of on-the-job training. Liu et al. (2022) document that voluntary provision of paid parental leave – though not gender-neutral benefits – is also negatively correlated with the share of college-educated women in an industry, suggesting that employers offer female-friendly benefits to attract women in contexts where female talent is relatively scarce.

Using matched employer-employee data for Germany, Costas-Fernandez et al. (2024) complement existing evidence on firm incentives with an analysis of labor supply responses and show that firms offering childcare to employees have a higher share of returning mothers after maternity leave, especially so for high-wage mothers, who are presumably more difficult to replace. Corradini et al. (2024) consider changes in job amenities induced by a collective bargaining reform in Brazil that prioritized women's needs, with an emphasis on paid maternity leave, childcare, and flexible work schedules. They find that firms treated by the reform saw a marked improvement in female-centric amenities, together with increased female hires and

improved retention. Importantly, gains for women were realized without a trade-off in their wages, or in male employment and earnings, or even firm profitability. The interpretation is that the reform refocused unions' priorities on pareto improvements that would not have gained enough support in the aggregation of workers' interests at baseline.

6 The Role of Identity and Norms in Understanding Gender Inequalities

The disparate impact that parenthood has on the careers of women relative to men suggests that gender inequality in the labor market likely has its roots in gender roles within the household which are shaped by wider societal norms. In the presence of gender norms that dictate the appropriate role of women in society relative to men, deviating from the prescribed behavior of one's social category is costly, thus imposing constraints on individuals' behavior (Akerlof and Kranton, 2000).

In our model, as described in Section 3.1.1, gender norms affect household utility through the parameter η that determines the utility value that the household places on the wives' time at home. This simple representation of gender norms can serve to illustrate why work-family issues remain largely a "woman's problem" despite the converging economic roles of men and women in society. The model also provides some intuition as how η affects aggregate women's labor force participation (and vice versa) in an economy, and how it can evolve dynamically over time and space as a result of social transmission mechanisms.

This section reviews the empirical evidence on the quantitative relevance of gender norms on economic behavior, followed by a discussion of what drives the formation, evolution, and transmission of gender norms.

6.1 Relevance for Labor Supply and Household Specialization

Among the "new classes of explanations" that Bertrand (2011) highlighted in the previous Handbook chapter, the role played by gender norms in explaining persisting gender gaps has attracted, by far, the most attention among economists in the past decade. Building on the theoretical foundations laid out by Akerlof and Kranton (2000) – where identity considerations are modeled to directly enter an individual's utility function – earlier papers in this stream have sought to provide direct tests of the relevance of the gender identity model for understanding women's relative outcomes. Bertrand et al. (2015) focus on the behavioral prescription that "a man should earn more than his wife" and show that adherence to this norm has wide-ranging

economic and social consequences. The authors show, using administrative earnings data from the U.S., that the distribution of the share of household income earned by the wife exhibits a sharp drop-off at 0.5 – i.e., when the wife starts to out-earn her husband, consistent with the existence of gender identity norms that induce an aversion to a situation where the wife earns more than her husband.

The authors explore other potential manifestations of the norm in marriage formation, wives' labor market outcomes, marital satisfaction, and the division of home production. They find that within marriage markets over time, when potential wives are more likely to out-earn potential husbands, the marriage rate declines. Looking within couples, when the wife's potential income is more likely to exceed the husband's, her labor supply is reduced and, even if she does work, her realized earnings fall further from her full earnings potential. The authors argue that this is consistent with the wife distorting her labor supply to avoid a gender-role reversal and appear "less threatening." Finally, couples where the wife earns more than the husband are less happy, stable, and ultimately more likely to divorce. Moreover, in such couples, wives take on a greater share of the household, possibly to assuage their partner's unease with the situation.

The findings on relative earnings and marriage durability are consistent with Folke and Rickne (2020) who exploit close elections as a source of plausibly exogenous variation in job promotions for politicians and show that promotions to top jobs substantially increases the likelihood of divorce for women relative to men in Sweden. They provide descriptive evidence that similar results hold in the corporate sector for job promotions to CEO. Consistent with an identity-based channel, these effects are largely concentrated among gender-traditional couples where the promotion represents a larger deviation from initial gender role expectations at the time of marriage. Such trade-offs between career and marriage might explain why women continue to remain underrepresented in top jobs and leadership positions.

Bursztyn et al. (2017) provide further evidence supporting the idea that women might avoid actions that advance their careers due to perceived or actual trade-offs between marriage and career. Focusing on MBA students at UCLA, the authors first show that while married and unmarried women have similar grades on course components that are unobservable to other students such as exams and assignments, unmarried women have systematically lower participation grades. These descriptive patterns are consistent with unmarried female students downplaying their ability and ambition in the classroom setting to avoid signaling traits that might reduce their desirability as potential marriage partners. The authors provide direct evidence on this apparent trade-off with a field experiment using a real-stakes questionnaire on

job preferences and personality traits that newly admitted students are required to complete for internship placement. Students were randomized into a "public" condition where they were told their answers would be discussed in the career class, and a "private" condition where they were told instead that their anonymized answers would be discussed. The authors find that single female students report less ambitious career goals and leadership attributes in the public condition, whereas neither those of married women or men (regardless of relationship status) differed across the two conditions.

More recently, a related line of work by Ichino et al. (forthcoming) infers the strength of gender norms by studying how the spousal division of childcare responds to changes in the marginal tax rate faced by each spouse. Building on a household model in which spouses jointly choose to invest their time in market work and childcare, the authors point out that, under some assumptions, the degree of substitutability of spousal inputs in childcare is a key parameter that captures the strength of norms. Lower substitutability implies that couples have stronger preferences regarding specific combinations of spousal inputs in childcare and are less willing to reallocate their time when relative wage rates change, thereby sacrificing total household income. Exploiting variation in wage rates from Swedish tax reforms, the authors estimate elasticity parameters for different groups of couples that likely differ in their attitudes toward gender roles. They find that the allocation of home production among immigrant groups from countries with more traditional gender norms tend to react more strongly to a reduction in the husband's than the wife's tax rate. Native couples, on the other hand, have more symmetric responses. Taken to a larger scale, these findings imply that public intervention would face an uphill struggle in tackling gender inequalities whenever individual responses are mediated by conservative norms. Relatedly, Giommoni and Rubolino (2022) examine bunching responses to an Italian tax policy that grants a credit to the main earner when the second earner reports income below a cutoff. They find that second earner women maximize family income by bunching at the cutoff, while second earner men do not, with more pronounced gender difference in bunching among immigrants/natives from more gender-traditional countries/municipalities. Overall, these findings highlight that, in the presence of binding gender norms, couples appear to be willing to incur considerable monetary costs to comply with these norms.

Other papers have taken a different approach to assess the role of norms by asking whether standard theories of comparative advantage and household specialization can explain observed gender inequality in the household and the labor market. Using rich time-use data collected from all members of a household as part of the Household, Income, and Labor Dynamics in Australia (HILDA) survey, Siminski and Yetsenga (2022) develop new measures of within-household

specialization and test the predictions of a formal Beckerian domestic production model. They show that women do more domestic work than their male spouse at every point in the support of the relative wage distribution, and that the allocation of domestic work within the household is only weakly related to relative wages. Overall, they find that comparative advantage plays little to no role in the sexual division of labor within couple households. Relatedly, Andresen and Nix (2022) show that controlling for measures of predetermined relative labor market productivity differences between spouses as a proxy for comparative advantage does not eliminate motherhood penalties among heterosexual couples.

6.2 Stereotypes, Beliefs, and Discrimination

The relevance of norms for explaining persistent gender gaps in the household and labor market has gained increasing traction among economists. Much of the work focuses on a supply-side interpretation, where prevailing norms and stereotypes act as constraints to women's (and men's) decisions within the household and the labor market. Nevertheless, our understanding of the wider implications of stereotypes and norms on preferences and skills, and ultimately, its overall quantitative importance, remains lacking. As Bertrand (2020) discusses in her 2020 AEA presidential address, the very nature of norms implies that individual decisions are shaped by powerful stereotypes about gender-specific roles and attributes. These stereotypes are not only descriptive, but prescriptive, and directly affect one's self-image, shaping preferences over what is appropriate given prescribed behaviors associated with one's gender group. The broader implication is that such stereotypes tend to be self-fulfilling, with men and women adapting their behavior to what is expected from their gender group, either consciously or unconsciously.

Viewed from this perspective, one has to be careful when attributing differences in choices and outcomes between men and women to observed differences in skills, traits, or "preferences," as these could themselves be shaped by prevailing stereotypes and norms (Lundberg, 2022). Assessing the extent to which underlying differences across genders along these dimensions are intrinsic or socially conditioned matters crucially for our interpretation of gender inequality and the design of policies to tackle the remaining gaps. Future research along these lines, particularly drawing on insights from related disciplines such as social psychology, would be highly valuable.

In the presence of powerful norms and stereotypes, a related conceptual challenge that labor economists have to grapple with is the distinction between "choice" and differential treatment, which economists have traditionally labeled as "discrimination." Lundberg (2022) argues that to the extent that observed choices are the outcome of differential treatment or socialization by parents, schools, and society even before boys and girls enter the labor market, the discrimina-

tion versus choice dichotomy does not make sense either conceptually or empirically. Moreover, to the extent that prevailing stereotypes about gender-specific roles and attributes serve as a basis for employer discrimination either statistically or because of taste (e.g., violation of identity norms as suggested by Akerlof and Kranton (2000)), discrimination and norms may in fact be more appropriately viewed as two sides of the same coin.

Along these lines, a recent strand of work has started to emerge to explore how different types of discrimination and gender stereotyping affect women's economic progress by hindering not only the allocation of talent across the occupational distribution but also women's career advancement.

Differential gender access to the labor market may persist due to discriminatory beliefs about women diluting the prestige of male-dominated occupations (e.g., Goldin (2014b)'s pollution theory). Greenberg et al. (2024) test this theory by studying women's integration into combat and leadership roles in the U.S. Army, following the 2016 end of the Ground Combat Exclusion Policy for women. Using detailed personnel and survey data, they show that integrating women into previously all-male units does not negatively affect men's or the unit's personnel outcomes (e.g., retention, promotions, separations for misconduct). However, it does lead to a negative shift in male soldiers' perceptions of workplace quality.

Overt or unintentional discrimination by employers, managers, and supervisors, or their beliefs regarding gender differences in the "treatment" effect of having children, may contribute to the divergent earnings trajectories of mothers and fathers as described in Section 4.2. Mothers could be deliberately passed over for promotions, or supervisors could engage in "sexist paternalism," which, while intended to protect, actually harms them (Buchmann et al., 2024). By contrast, fathers (and married men in general) may be rewarded in the labor market based on perceptions of fairness or personal preference. For example, using data from a U.S. manufacturing firm in 1976, Korenman and Neumark (1991) found that men's earnings profiles steepen after marriage, which is linked to married men receiving higher performance evaluations from supervisors.

Attribution bias regarding women's ability to perform in historically male dominated leadership positions has been identified in fields like business, finance, and medicine. Landsman (2019) finds evidence of a gender punishment gap among S&P 1500 executives: following poor firm performance, female executives are more likely to lose their positions compared to male executives. Sarsons (2024) uses detailed Medicare data to test whether referring physicians assess patients' surgical outcomes differently depending on the surgeon's gender. She documents an asymmetric treatment of negative outcomes among U.S. surgeons, with female surgeons ex-

periencing a larger drop in patient referrals relative to their male counterparts after a patient death. Conversely, male surgeons receive a larger increase in patient referrals following positive surgical outcomes. Sarsons' study is one of the most convincing in this area, as her data allow for the control of factors like patient and procedure risk and surgeon experience, isolating the gender-driven portion of these biases. Egan et al. (2022) find a similar asymmetric punishment gap in the financial advisory industry. Following an incident of misconduct, female advisers are 20% more likely to lose their jobs and 30% less likely to find new employment compared to male advisers. The study finds that this gap is not driven by gender differences in occupation, productivity, the nature of the misconduct, or recidivism. As with Sarsons' work, the study shows limited evidence that the punishment gap is driven by rational or Bayesian profit maximization. For example, the gap in hiring and firing diminishes in firms with a greater percentage of female managers and executives.

Differential treatment by employers could also extend to men when they deviate from commonly accepted behavior, making it equally challenging for them to engage in gender atypical behavior. Using a survey experiment and a large-scale audit study, Weisshaar (2018) find that fathers face a higher penalty when they take time off work to care for family relative to mothers, especially in tight labor markets, which she argues is due to a violation of "ideal worker" norms which are more rigidly applied to men than women. This might explain why, in many contexts, men are reluctant to take paternity leave, even when this is job protected and fully compensated. Competition within the workplace, either real or perceived, could further exacerbate such mechanisms especially when workplace performance is tied to in-person presence or visibility. This is nicely illustrated by Johnson et al. (2024) who observe the career progression of new fathers whose pools of competitors contain varying shares of men eligible for paternity leave under a policy reform in Norway. Results indicate that a new father with a large share of coworkers eligible for paternity leave enjoys higher post-child earnings than an otherwise similar father with a small share of eligible coworkers. This difference is attributed to higher visibility in the workplace of oneâs competitors who are not eligible for paternity leave. Importantly, the paper finds that the whole (small) negative impact of leave taking on fathersâ earnings boils down to competition effects, rather direct effects. In other words, conditional on having a child, all fathers would be better off if leave-taking became universal.

Another strand of work examines the role of stereotypes as a form of pre-market discrimination largely in the context of the gender gap in educational choices. Several studies have documented that adults shape gender-appropriate behavior in children, affecting their choices, preferences, and beliefs about their ability. For example, Carlana (2019) shows that assignment

to math teachers with stronger implicit gender stereotypes widens the gender gap in math performance and leads girls to select into less demanding high schools. These effects are driven, at least in part, by girls' lower self-confidence in their math ability when exposed to gender-biased teachers. Nosek et al. (2009) and Nollenberger et al. (2016) document that gender attitudes matter for the gender gap in math and science performance among children across countries and across immigrant groups within the U.S., respectively. Other studies find that female role models are effective in encouraging women to major in economics (Porter and Serra, 2020), participate in STEM-related activities (Del Carpio and Guadalupe, 2021), and enrol in selective and male-dominated STEM programs in college (Breda et al., 2023), suggesting that women's lower preferences for STEM education and careers are likely to be socially constructed.

Such pre-market discrimination could in itself be a reaction to anticipated discrimination in the labor market and marriage market. Manning and Swaffield (2008) and Kaestner and Malamud (2023) provide some evidence in line with women and men experiencing differential treatment in the labor market when they deviate from commonly accepted behavior. Specifically, using data from the NLSY, Kaestner and Malamud (2023) show that women characterized as "headstrong" and boys who were considered as "dependent" when they were children experienced earnings penalties as adults, all else equal. In terms of the marriage market, Wiswall and Zafar (2021) find that women perceive a marriage market penalty to completing a degree in science or business, relative to a humanities or social science degree, and that such family expectations are particularly important for women's major choices. This is similar in spirit to Bursztyn et al. (2017)'s finding that MBA women choose to avoid public expressions of career ambition due to concerns that this would depress their marriage market prospects.

The emerging work suggests that the presence of gendered expectations and incentives invariably sets up a self-perpetuating cycle where demand-side and supply-side considerations – buttressed by stereotypes and norms – reinforce each other to impact preferences, skill investment decisions, and the labor market choices of women and men.

6.3 What Drives Gender Norms and How Malleable are They?

The growing recognition of the empirical relevance of gender norms for understanding gender inequality has brought to the fore the question of what drives the formation and evolution of gender norms.

6.3.1 Historical Origins and Persistence

A relatively large literature has established the historical origins of gender norms and shown how cultural persistence can lead to the stickiness of norms over long periods of time. This literature provides an indication of historical conditions that shape gender-role attitudes, including agricultural practices that promote specialization along gender lines, changes in the relative demand for female labor, and bargaining in the marriage market.

One of the earliest papers in this stream, by Alesina et al. (2013) demonstrate how traditional agricultural practices influenced historical gender roles and led to long-term persistence in female labor participation. Exploiting variation in historical geo-climatic conditions for growing crops using the plough versus shifting cultivation, the authors find that among ethnicities and countries whose ancestors practiced physical strength-intensive plough cultivation, which tended to favor male labor, women were historically less likely to participate in farm work and, today, have lower rates of female labor force participation and hold less progressive gender-role attitudes. Follow-up work by Hansen et al. (2015) studies the role of agricultural history more generally and finds that societies with longer histories of agriculture (i.e., earlier Neolithic revolutions) have lower female labor force participation and less equal gender roles today, likely led by a combination of higher fertility and stronger household specialization, whereby women predominantly engaged in child-rearing and cereal processing.

Other papers in this stream have explored the historical role of uneven sex ratios and changes in the value of women's work. Grosjean and Khattar (2019) study the long-run impacts of historical male-biased sex ratios induced by the resettlement of convicts to Australia, and show that areas with more male-biased sex ratios historically are characterized by more traditional gender-role attitudes and greater gender inequality in the labor market in the present day, well after sex ratios are back to the natural rate. Xue (2023) explores how the cotton revolution in imperial China, which led to a sharp increase in high-value work opportunities for women, affected cultural beliefs about women's worth. Exploiting variation across counties in premodern cotton textile production, generated by weather-suitability for cotton weaving and distance from the national market, she finds that areas with higher premodern cotton textile production had lower sex ratio at birth in 2000, stronger position of women in the household, and more progressive gender-role attitudes. A common thread across these studies is the emphasis on the role of vertical cultural transmission in sustaining long-term persistence across generations (Bisin and Verdier, 2001).

6.3.2 Cultural Change and Learning

That historical forces continue to shape patterns of gender norms today can help to explain the stickiness of gender norms even as economic conditions change. Yet, throughout history, there have been numerous instances where gender norms have changed relatively quickly in response to technological innovations, economic development, and changes in the social and political landscape. For example, in the case of the U.S., innovations in contraception, widespread adoption of home production technologies, improvements in maternal health, and the availability of substitutes to maternal inputs such as infant formula, provided women with greater ability to plan childbearing, reconcile work and domestic responsibilities, and invest in education and their careers (Goldin and Katz, 2002; Greenwood et al., 2005; Albanesi and Olivetti, 2016). As Goldin (2006) argues in her 2006 Ely Lecture, these changes, coupled with legislative changes that removed explicit barriers to women's work (e.g., marriage bars) and antidiscrimination legislation, are likely to have contributed to the altering of women's identity and changing gender roles beginning in the 1960s and accelerating from the 1970s onwards. Political institutions have also been shown to be an important driver of the adoption of new norms. Several studies show how exposure to state socialism – which promoted women's economic inclusion – has led to the adoption of more progressive gender-role attitudes, increased women's preferences for work, and altered gender roles within the household (Beblo and Görges, 2018; Campa and Serafinelli, 2019; Senik et al., 2020; Boelmann et al., 2024).

A few recent papers focus on the role of public policies in shifting gender norms. Bastian (2020) shows that, by boosting maternal employment, the introduction of the Earned Income Tax Credit (EITC) led to higher approval of working women. Examining the intergenerational effects of the introduction of paternity leave in Spain, Farre et al. (2023) find that children born after the policy change exhibit more gender egalitarian attitudes, engage more in counter-stereotypical household tasks, and are more likely to report future expectations regarding their own work and family choices that deviate from the traditional male-breadwinner model. The authors attribute these effects to children's exposure to greater involvement in childcare by fathers and greater willingness of mothers to return to work after childbirth that resulted from fathers' take-up of paternity leave due to the reform (Farre and Gonzalez, 2019). Other papers focus on school-based interventions or curriculum and show that these have the potential to shift norms. For example, Dhar et al. (2022) evaluate a randomized intervention in India that engaged adolescent boys and girls in classroom discussions about gender equality. The authors find that the program led to a persistent increase in progressive gender attitudes and self-reports of more gender-equal behavior. Hara and Rodriguez-Planas (2023) show that a Japanese educational

reform that eliminated gender-typed and gender-segregated classes in industrial arts and home economics in junior high schools led to changes in beliefs regarding men's and women's gender roles and a shift toward less gendered specialization of tasks within the household.

While these papers identify particular forces that shape gender norms at a particular point in time in a given society, the underlying mechanisms that generate widespread cultural change or why cultural change happens more rapidly in some societies but not others is less well-understood. Motivated by the S-shape patterns for female labor force participation and gender-role attitudes from 1940 to 2000, Fernández (2013) proposes a model of cultural change to explain the evolution of social beliefs in the U.S. In her model, cultural change results from a rational, intergenerational learning process where individuals with heterogeneous beliefs about married women's long-run payoff from working update their beliefs by observing the labor supply behavior of women in the preceding generation. Calibrating the model to key statistics for 1980 to 2000, the author finds that the model is able to replicate the dynamic path of married women's labor force participation from 1880 to 2000 and that the paths of both beliefs and earnings had an important role to play in the dramatic evolution of women's work over the past century.

Fogli and Veldkamp (2011) propose a related model where women learn about the effects of maternal employment on children by observing employed women nearby. When few women work, there is little information and participation rises slowly. As information accumulates in some regions, this reduces the uncertainty of the effects of maternal employment, leading to more women in those regions participating. Within these regions, learning accelerates, labor force participation rises faster, and regional participation diverges. Eventually, as information diffuses throughout the economy, beliefs converge to the truth, participation plateaus, and regions become more similar. Similar to Fernández (2013), the calibrated model delivers an S-shaped evolution of aggregate female labor force participation and gender-role attitudes. In addition, the local nature of the learning process generates geographically heterogeneous, but locally correlated reactions, similar to that observed in the data.

Giuliano and Nunn (2021) offer some insights into the question of why culture persists in some cases but not others by testing the empirical relevance of a key determinant that has emerged from the theoretical evolutionary anthropology literature – the stability of a society's environment across generations. The idea is that if the environment is stable, cultural values and beliefs that have evolved and survived are likely to contain information that is relevant for the current generation; by contrast, if the environment changes a lot from one generation to another, the previous generation's values and beliefs are less likely to be relevant for the

current generation. Using cross-generational variability in climate conditions and a variety of samples and empirical strategies, the authors show that populations with ancestors who lived in environments with greater climate instability place less emphasis on maintaining tradition and exhibit less persistence in cultural norms, including gender norms.

While these papers make some inroads in tackling the question of how and why gender norms change, there remains much scope for future work. For example, we still have limited understanding of how gender norms evolve in the face of market forces that are making these norms increasingly costly, the types of gender norms that are likely to change or become relevant as the economic and social environment changes, and what it takes to precipitate and sustain widespread cultural change.

6.3.3 Transmission Channels

How beliefs are formed and transmitted is key to understanding why gender norms are persistent as well as how cultural change can be achieved. The literature typically emphasizes three forms of cultural transmission: vertical transmission from parents to children, oblique transmission based on non-parental and non-peer elders (e.g., role models or teachers), and horizontal transmission from peers.

There is growing evidence on the relevance of each of these channels for the transmission of gender norms and preference formation. The large literature on the relevance of origin country norms on the work and fertility preferences of second-generation immigrants implicitly assumes that the family is the primary channel through which norms are transmitted, reinforced perhaps by ethnic social networks (e.g., Fernández and Fogli, 2009; Blau et al., 2013; Di Miceli, 2019). Several studies examine the vertical transmission mechanism more directly. For example, exploiting variation in the mobilization rates of men across U.S. states during WWII as a shock to mothers' labor force participation, Fernández et al. (2004) show that men whose mothers worked are more likely to have working wives. Interestingly, they find little evidence that married women's work behavior is affected by whether her own mother works. Using linked parent and child surveys, Farré and Vella (2013) and Bertrand (2019) show that mothers' gender role attitudes and exposure to non-traditional family types are associated with their children's gender-role attitudes as young adults, and daughters' work behavior. Within the family, sibling sex composition has also been shown to affect gender-role attitudes and behavior. Women with a brother rather than a sister tend to hold more traditional family attitudes and exhibit a greater degree of gender conformity in their occupation and partner choice (Rao and Chatterjee, 2018; Cools and Patacchini, 2019; Healy and Malhotra, 2013) likely due to sex-typing in mixed-

gender sibships or differential parental investments. Using time-use data from Denmark, Brenøe (forthcoming) provide some suggestive evidence of such "gendered-parenting" among children with an opposite-sex sibling.

Apart from vertical transmission from parents to children, several studies have also documented the oblique transmission of norms and counter-stereotypical behavior from non-parental elders within social groups. Exploiting variation in the employment status of mothers across different cohorts of students within a high school, Olivetti et al. (2020) show that adolescent women who were exposed to more peers with working mothers are less likely to feel that work interferes with family responsibilities, and are more likely to work for pay when they have children. This gender-role socialization effects through peers' mothers is above and beyond the effects of their own mothers. In addition, the papers discussed in Section 6.2 on the influence of female role models and teachers' steoreotypical attitudes on the gender gap in STEM are further examples of the oblique transmission of norms and beliefs.

Finally, the horizontal transmission of norms through peers can amplify initial changes in the behavior of a given social group, facilitating sustained changes in norms over time. Maurin and Moschion (2009) and Mota et al. (2016) provide evidence from France that married mothers' decision to participate in the labor market is influenced by the labor supply behavior of other mothers living in the same neighborhood. Relatedly, Nicoletti et al. (2018) use Norwegian administrative data to examine the causal influence of the family network on mothers' labor supply decisions and find that cousins and sisters significantly affect the number of hours worked by mothers of preschool children. Moreover, they find, perhaps not surprisingly, that family peers have a stronger effect that neighborhood peers. The authors perform a back-of-the-envelope calculation to quantify the family peer effect and estimate a social multiplier factor of 1.5 for a given direct increase in labor supply. As emphasized by Fogli and Veldkamp (2011) and Fernández (2013), such horizontal transmission of norms provides a natural explanation for the large variation in labor supply behavior across subgroups of workers, geography, and over time.

6.3.4 Information Gaps

It remains quite puzzling that gender norms remain persistent even in the face of evolving market forces that are making the adherence to these norms increasingly costly. An emerging strand of work suggests that systematic misperceptions of others' views toward counter-stereotypical behaviors can help explain why norms remain sticky even when the economic or social environment changes. Such a situation where most people personally reject a norm, but they incorrectly

believe that most others accept the norm, and end up adhering to the norm because of the fear of social sanctions is referred to as "pluralistic ignorance" by social psychologists.

One of the first papers to examine the empirical relevance of misperceptions for understanding economic behavior is Bursztyn et al. (2020)'s study of female labor force participation in Saudi Arabia. The authors draw on several surveys to document that the vast majority of young married men in Saudi Arabia privately support women working outside their home, yet substantially underestimate the level of support by their peers. They provide evidence that experimentally correcting these beliefs increases men's willingness to let their wives to search for jobs and, consequently, increases the likelihood that their wives applied and interviewed for a job outside the home. A closely related study by Cameron et al. (2024) in Indonesia documents similar misperceptions in women's (but not men's) support for working women and the level of support among men for sharing childcare and that providing information about the true level of support in the community increased both genders' support for working women, especially among men whose wives were not working for respondents with school-aged children. Cortés et al. (forthcoming) show that misperceptions regarding the support for mothers' participation in the labor market contribute to the stickiness of gender norms even in the U.S., where the prevailing norm is much less extreme and women and men have similar access to education and labor market opportunities.[13] Such misperceptions can also potentially explain the slow take-up of policies aimed at directly trying to counter stereotypes such as encouraging paternity leave-taking among fathers (Miyajima and Yamaguchi, 2017).

The finding that misperceptions regarding gender norms are widespread and likely constrain the adjustment of prevailing norms and behavior in a way that reflects the true sentiment and beliefs of the population suggests a seemingly straightforward and concrete solution to facilitating the shift in gender norms – providing information. While the findings from the above-mentioned studies indeed suggest that such an approach is promising, research in this area is still in its infancy. Existing studies have largely focused on short-run changes in attitude and beliefs and, at most, medium term changes in intermediate outcomes related to the job search process; more evidence on the effectiveness of information provision in shifting actual behavior is still needed. Moreover, while economists have typically favored information provision in the form of simple messaging directed toward an individual, in the context of shifting norms, it is unclear that such a light-touch approach is sufficient to credibly and meaningfully address

[13] Follow-up work by Bursztyn et al. (2023) takes on a cross-country perspective and studies actual and perceived gender norms regarding (1) the basic rights of women to work outside the home, and (2) gender affirmative action across 60 countries. The authors establish widespread misperceptions of gender norms in these two domains around the world with the patterns in the extent and direction of the misperception depending on the type of norm and how gender-equal the country is. The authors argue that the patterns can be best explained by overweighting of the minority view and gender stereotyping.

widely-held misperceptions. Social psychologists have long emphasized that norms exist within group processes and individuals are most likely to update their beliefs about the group norm if they can directly observe that stated views and actions of their peers through the dynamic processes of social proof and reality testing (e.g., Cialdini et al., 1999; van Kleef et al., 2019). Providing support for this view, Dahl et al. (2014) document considerable peer effects in paid paternity leave-taking in Norway – coworkers and brothers are more likely to take paternity leave if their peer is exogenously induced to take leave. Importantly, the peer effects increase over time as more individuals within the peer group observe and take-up leave. Future work that considers how to embed social norm interventions within the context of group processes could be especially promising (Prentice and Paluck, 2020).

7 Conclusion

Gender is now a mainstream topic in economics. Over the past decade, labor economists have zeroed in on several leading explanations for the remaining gender disparities in the labor market. There is now a clearer distinction between the role of preferences and constraints in driving gender gaps, and increasing recognition that essential differences between men and women in terms of preferences, skills, and psychological attributes play, at best, a modest role in explaining the remaining gaps.

The more prominent explanations today center around the differential constraints that women, especially mothers, face due to the trade-offs involved in seeking to balance work and family responsibilities. There is now ample evidence suggesting that parenthood drives a large wedge in the career trajectories of mothers and fathers, and an emerging body of work analyzes the precise mechanisms at play. Research has documented gender difference in the willingness to pay for job attributes such as workplace flexibility, shorter hours, and shorter commutes, and the implications for gender-based sorting across occupations and firms. Heterogeneity in preferences has also renewed interest in the impacts of firms' monopsony power on gender gaps via gender differences in the labor supply elasticity to the wage.

Much of the extensive literature on career-family trade-offs focuses on mothers, often overlooking the fact that motherhood earning penalties are in several contexts accompanied by fatherhood premia. A more integrated perspective on couples could help understand patterns of spousal specialization upon childbirth and their role in shaping child penalties.

The acknowledgment of heterogeneous family constraints has brought to the fore the idea that entry barriers into certain professions interfere with the efficient allocation of talent to jobs. Recent work has provided evidence of productivity gains from the entry of both women and

men into contexts in which they are under-represented. However, it is hard to draw conclusions on overall efficiency from analyses of specific sectors, without a symmetric analysis of gains and losses in the respective feeder sectors. By considering job allocation across the whole economy, work by Hsieh et al. (2019) is an important exception. However, their analysis may not factor in the household sector. A fuller understanding of the welfare consequences of a more equitable allocation of talent would require a broader perspective that considers gender comparative advantages both in the market and the home.

The disparate impact of parenthood on the careers of mothers and fathers is suggestive of deep-seated cultural foundations of gender roles in family care. The past two decades have seen enormous progress in economists' understanding of the role of prescriptive norms and stereotypes in shaping career-family trade-offs. Research had also shed light on historical, political, and economic determinants of cultural change as well as the influence of families, education and the media in eroding or perpetrating gender stereotypes.

Current developments in the organization of work and cultural shifts have sparked debate regarding the gender inequality outlook. There is some indication that work in certain professions is becoming "greedier", increasingly rewarding long and inflexible hours and raising the returns to specialization within the household. Another important development has been the rise in gig work and remote working opportunities as more businesses embrace digital technologies. In so far as gig or remote work encourages worker substitutability, penalties associated with work flexibility should be minimized. Nevertheless, there are concerns that while women continue to be the primary childcare provider, such developments could further entrench household specialization. The freedom of choice and lack of structure in gig and remote work, paradoxically, could also women even more available to take on additional household responsibilities, possibly resulting in productivity losses. The understanding of "technological" and cultural sources of the convex returns to long (and inflexible) hours â as well as a broader consideration of how the structure of the work interacts with existing gender roles â would help with efforts to harness technology in the design of more equitable workplaces.

On the family front, parenting has also become more time-intensive: over the past two decades, time spent with children has risen steadily for both parents, but especially so for college-educated mothers in the US and other high-income countries (Kuziemko et al., 2018). There are signs that rising demands for parental time could be driven by increasing returns to education and non-cognitive skills, coupled with higher competition for top schools and colleges. These developments are likely to increase the costs of motherhood, actual or perceived, potentially interfering with fertility decisions and the labor market involvement of mothers.

On the cultural front, the gradual long-term evolution towards more gender-balanced social norms has nonetheless been accompanied by a resurgence of gender conservatism in developed and developing countries alike, often intertwined in the rise of populist politics. We expect that efforts that seek to address gender disparities in the labor market will have to contend with these emerging challenges. While effectively revealing the cultural roots of "family penalties" for women, research should deepen our understanding of how families, education and the media erode or perpetrate gender stereotypes. This knowledge will be crucial for informing policy interventions in these areas.

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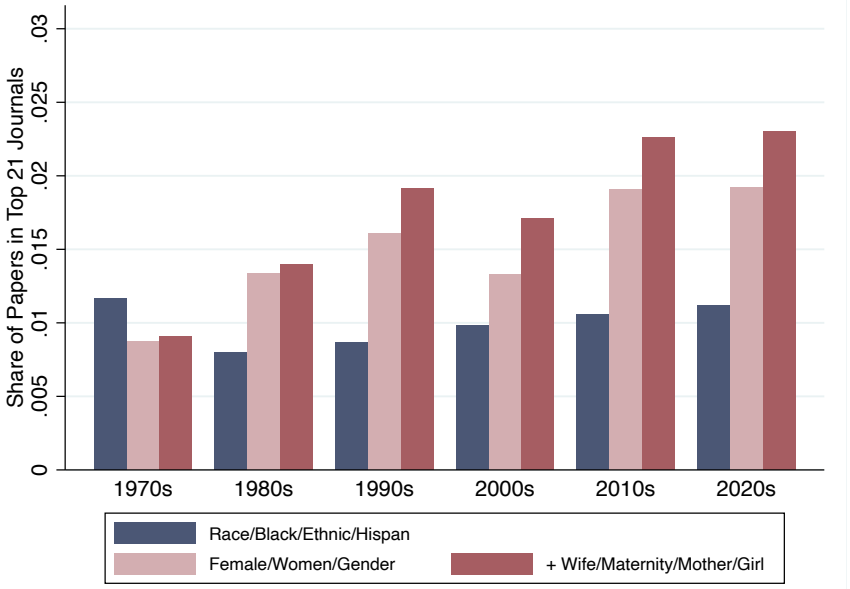
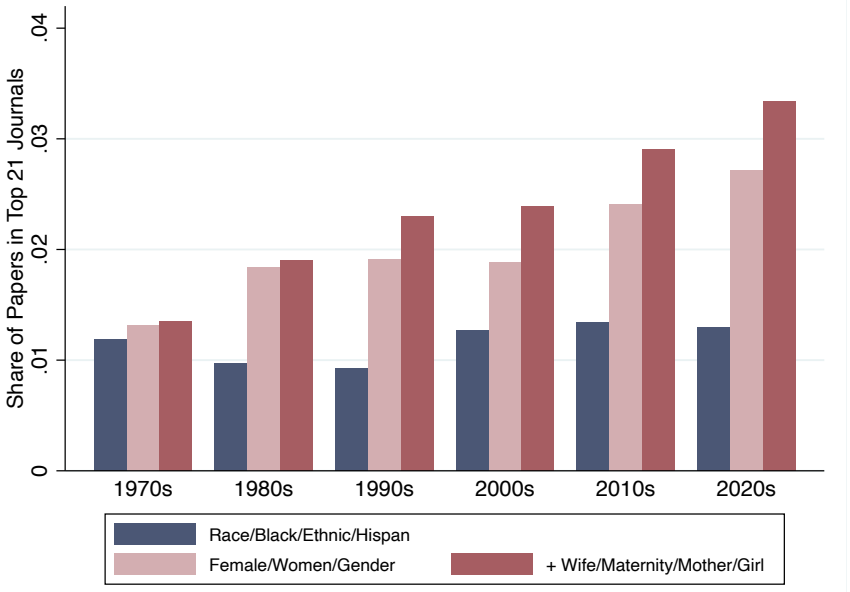
A Appendix: Gender in Economic Journals

Figure A.1: Gender vs. Race Papers in Top 21 Economics Journals Available in EBSCO

(a) Classification Using Paper Title



(b) Classification Using Listed Subject(s)



Note: Titles and subjects of papers are extracted from EBSCO's research database for 21 of the top 30 economics journals for which information on paper subject is available. See Appendix Table A.1 for the 21 journals that are included in this exercise. Each time period covers all papers published in the top 21 economics journals during that period. The 2020s time period is limited to the years up to 2023. The classification using paper title in Panel (a) follows the same procedure as described in Figure 1 applied to the 21 journals. Panel (b) uses the same keyword search procedure applied to the EBSCO listed subject(s) of the paper instead of the paper title. The blue bars show the share of race-related papers; the red bars show the share of gender-related papers using different sets of gender-related keywords.

Table A.1: List of Top 30 Economics Journals

	Included in Top 21 List
Quarterly Journal of Economics	✓
American Economic Review	✓
Econometrica	✓
Review of Economic Studies	✓
Journal of Political Economy	✓
American Economic Journal: Macroeconomics	
American Economic Journal: Applied Economics	
Journal of the European Economic Association	✓
American Economic Journal: Economic Policy	
Journal of Labor Economics	✓
Theoretical Economics	
Review of Economics and Statistics	✓
Journal of Monetary Economics	✓
American Economic Journal: Microeconomics	
Journal of Human Resources	✓
Quantitative Economics	
Journal of Economic Growth	
Economic Journal	✓
RAND Journal of Economics	✓
Review of Economic Dynamics	✓
Journal of Business and Economic Statistics	✓
Journal of International Economics	✓
International Economic Review	✓
Journal of Economic Theory	✓
Journal of Public Economics	✓
Journal of Econometrics	✓
Experimental Economics	
Econometric Theory	
Journal of Development Economics	✓
Journal of Applied Econometrics	✓

Table A.2: Keywords Used to Identify Topics Among Gender Papers

Topics	**Keywords**
Labor/Pay/Job	*labor, labour, wage, earn, pay, work, firm, occup, wealth, unemploy, employ, particip, job, displac, busi, career, occup, salari, hire, incom, economi*
Family/Marriage	*famili, marit, marriag, sibl, child, son, fertil, fecund, sibship, marri, household, mother, wife, matern, mate, birth, divorc, parent*
Education	*school, educ, colleg, academ, skill, stem, student, classroom, achiev, teacher, teach, math, human capit, major, scienc, engin, faculti, professor*
Discrimination/Bias/Norm	*discrimin, bias, stereotyp, norm, cultur, attitud, ident, gender role*
Development	*develop, microfin, growth, tanzania, pakistan, bangladesh, bengal, china, india, nepal, africa, philippin, empower, corrupt, cast*
Politics/Finance/Law	*polit, suffrag, govern, vote, elect, institut, juri, ceo, financ, credit, entrepeneur, corpor, quota, lawyer, glass ceil*
Behavioral	*risk, pressur, uncertainti, compet, stake, overconfid, selfish, altruism, generos, cooper, leadership, trust, negoti, generous, Cooperative, Co operation, willing, bargain*
Health	*health, morbid, mortal, depress, diseas, bulim, medic, abort, hiv, pandem*