INSTITUTE FOR EMPLOYMENT RESEARCH
The Research Institute of the Federal Employment Agency

IAB-DISCUSSION PAPER

Articles on labour market issues

08|2025 Unpacking the Link between Service Sector and Female Employment: Cross-Country Evidence

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ISSN 2195-2663

Unpacking the Link between Service Sector and Female Employment: Cross-Country Evidence

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Contents

Abstract

The surge in women's participation in the workforce has been a defining feature of advanced economies in recent decades. This paper explores cross-country variations in the relationship between service sector expansion and female employment in Europe and the US. We estimate the elasticity of the female employment with respect to the services employment and uncover substantial differences across countries in how strongly the female share of working hours responds to service sector expansion. Our findings show that this elasticity is higher in countries experiencing stronger structural transformation and greater female employment intensity in business services. Furthermore, greater female employment intensity in business services is associated with a larger food and accommodation sector. These findings suggest that countries undergoing greater reallocation from industry to services experienced stronger increase in female employment as their expanding business service generated additional labour demand in the food and accommodation sector, thereby pulling women more strongly to market work.

Zusammenfassung

Der starke Anstieg der Erwerbsbeteiligung von Frauen war in den letzten Jahrzehnten ein bestimmendes Merkmal der hochentwickelten Volkswirtschaften. Dieses Papier untersucht die länderübergreifenden Unterschiede im Zusammenhang zwischen der Expansion des Dienstleistungssektors und der Beschäftigung von Frauen in Europa und den USA. Wir schätzen die Elastizität der Frauenbeschäftigung im Verhältnis zur Beschäftigung im Dienstleistungssektor und decken erhebliche Unterschiede zwischen den Ländern hinsichtlich der Stärke auf, mit der der weibliche Anteil an den Arbeitsstunden auf die Expansion des Dienstleistungssektors reagiert. Unsere Ergebnisse zeigen, dass diese Elastizität in Ländern mit einem stärkeren Strukturwandel und einer höheren weiblichen Beschäftigungsintensität im Unternehmensdienstleistungssektor höher ist. Darüber hinaus ist eine höhere weibliche Beschäftigungsintensität im Unternehmensdienstleistungssektor mit einem größeren Lebensmittel- und Beherbergungssektor verbunden. Diese Ergebnisse legen nahe, dass Länder mit einer stärkeren Umverteilung von der Industrie zum Dienstleistungssektor einen stärkeren Anstieg der weiblichen Beschäftigung erlebten, da ihr expandierender Unternehmensdienstleistungssektor zusätzliches Wachstum im Lebensmittel- und Beherbergungssektor erzeugte und Frauen dadurch stärker in die Erwerbsarbeit zog.

JEL

J16, J21, J22, J24

Keywords

cross-country variation, female employment, service sector, service sector elasticity, structural transformation

Danksagung

In this paper, we use harmonized EU-LFS between 1983-2019 and EU-SILC between 2004-2019. Funding by Schoeller Foundation is gratefully acknowledged. We thank Husnu C. Dalgic, Matthias Doepke and Moritz Kuhn for their helpful comments in this paper. Sena Coskun: FAU Erlangen-Nuremberg, Institute for Employment Research (IAB), CEPR. Contact: sena.coskun@fau.de. Gonul Sengul: Ozyegin University. Contact: gonul.sengul@ozyegin.edu.tr.

1 Introduction

The increase in female employment is one of the most significant developments in advanced economies during the second half of the 20th century. It has made a substantial contribution to economic growth through a more efficient allocation of talent (Hsieh et al., 2019). Several explanations have been proposed for this phenomenon, with the most prominent being the U-shaped relationship between female employment and economic development (Goldin/Schultz, 1995; Tam, 2011; Ngai/Olivetti/Petrongolo, 2024; Gottlieb et al., 2024). This relationship operates through structural transformation—specifically, the expansion of the service sector as economies develop. The growth of the service sector attracts more women into the workforce, thereby increasing their participation (Ngai/Petrongolo, 2017). Much of the literature relies on this connection, as the majority of female employment is concentrated in the service sector. The high share of services in female labor market participation is often interpreted as evidence that women have a comparative advantage in services over industry. This view is based on the idea that service-sector jobs require traits more commonly associated with women.[1]

In this paper, we estimate the elasticity of female market work with respect to the service sector—that is, the extent to which female employment changes in response to a percentage change in the service sector share. This link is crucial to deepen our understanding of the relationship between structural transformation and female employment. The extent to which service elasticity varies across countries has important policy implications. If the elasticity is relatively uniform, if the only link is that service-sector jobs require traits more commonly associated with women, policymakers could promote service sector growth as a straightforward strategy to increase female labor force participation. However, if elasticity differs across countries, policymakers must also consider underlying mitigating and amplifying factors to design more effective interventions.

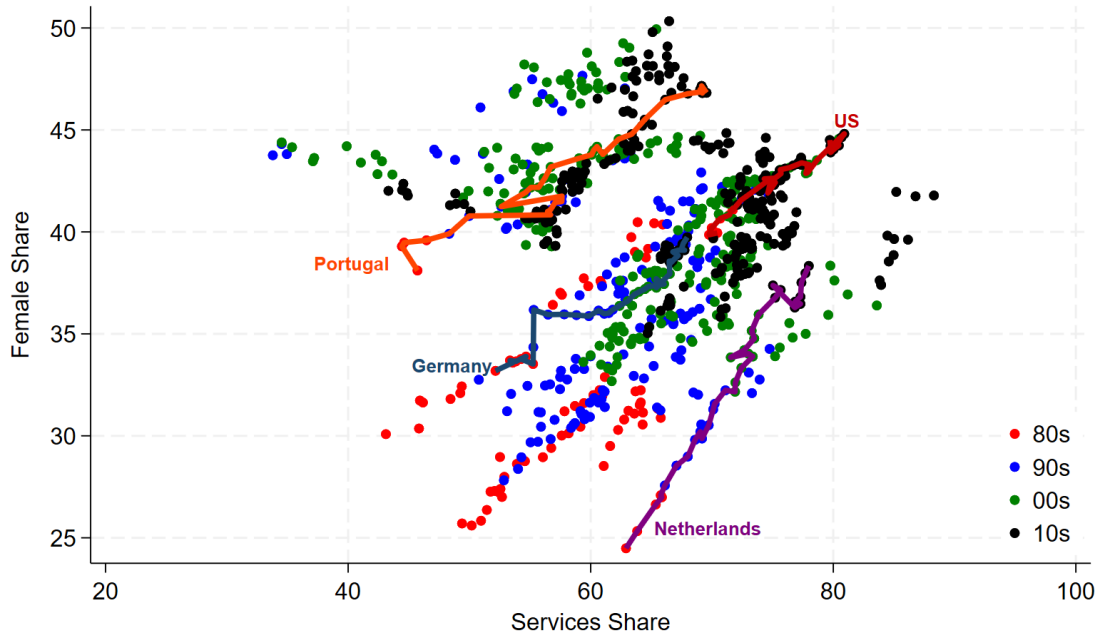
The elasticity might depend on several factors such as demand conditions (if not every service job is equally attractive and accessible for women), changing consumer demand patterns (through marketization), or women's general ability to enter market work. In this paper, we mainly focus on the role of the first two hypotheses without ruling out the potential role of general factors affecting women's employment.

To assess the link between services employment and female employment, we use the harmonized European Union Labor Force Survey for European countries and the Current

[1] (Rendall, 2017) provides an explanation for female comparative advantage in services sector, arguing that men are endowed with relatively more brawn giving them comparative advantage in industry. (Weinberg, 2000) shows in the data that the increased use of computers, by reducing the importance of physical skill requirements, contributed significantly to the increased demand for female work.

Population Survey for the US. Figure 1 displays the levels and time paths of the service share and the female share in total hours for European countries and the US. First, we notice that female employment changes immensely across countries, even among those with similar service sector sizes. For instance, although the US and the Netherlands have comparable service share levels, their female employment shares differ substantially. Similarly, Portugal has a relatively high female employment share despite having a lower service share than the U.S. These differences are not only evident in absolute levels at a given point in time but also in the trajectories they follow. More specifically, the changes in female employment and service sector shares diverge considerably across countries[2]. For example, the time paths for Germany and the Netherlands in Figure 1 display different slopes, indicating that the Netherlands experienced a faster increase in female employment share per unit of service sector expansion. This highlights that the effect of service sector growth on female employment share is not uniform across countries.

Figure 1: Female and Service Shares of Total Hours



Notes: Female share is computed as the the share of female aggregate hours in total aggregate hours worked, and services share is the aggregate hours worked in service sector as a share of total aggregate hours. Values are in percentages. See Section A1 for more details.

Source: Authors' calculation using an unbalanced panel from European Union Labor Force Survey from 1983 to 2019 for the European countries and the Current Population survey from 1983 to 2019 for the US.

To investigate the extent of the cross-country variation in the elasticity of female market work with respect to the service sector, we first conduct a shift-share analysis, following Olivetti/Petrongolo (2016), to confirm the link between structural transformation and

[2] Figure A1a displays the percentage point change in service and female shares of hours over the sample period to illustrate this variation. To ensure that the variation is not solely due to the relative sizes of service sectors, Figure A1b displays changes as fractions of their values in the first year.

female employment in our sample. We provide further evidence on that by incorporating additional European countries and using a more recent time period. Using the harmonized European Union Labor Force Survey for European countries and the Current Population Survey for the US, we compute female employment shares and sectoral shares of total hours worked for three major industry groups; agriculture, industry, and services.[3] Our data covers major European economies starting in 1983, and includes nearly all European countries from 2000 onward. As a result, it not only encompasses developed countries for which the female labor force is well-studied, but also includes countries with diverse structural transformation experiences such as those in Eastern and Northern Europe.

We confirm the presence of a strong link between structural transformation and female market work in our large and diverse sample. On average, women worked 39.7 percent of total hours in 2000, increasing by 2.3 percentage points to 42.1 percent in 2019. Of this increase, 1.9 percentage points were attributed to between-sector forces (sectoral reallocation), while 0.4 percentage points were due to within-sector forces. Between-sector forces contribute 83 percent of the total increase in female employment in our sample, a higher share than the 57 percent reported in Olivetti/Petrongolo (2016). Since our sample has more countries and covers a different time period, we also replicate the analysis for the countries included in Olivetti/Petrongolo (2016), and find that the between- and within-sector contributions are 2 and 1.8 percentage points, respectively. For this subset of countries, between-sector contributions explain 53 percent of the total increase in female employment, closely aligning with their findings.

To examine the elasticity of female employment with respect to service sector expansion, we use data from 2000 to 2019, ensuring a balanced panel. Our estimates indicate that a one percent increase in the service sector's share of total hours leads to a 0.55 percent increase in female share of total hours in the US (Table 1, specification 3). We also observe noticeable variation in elasticities across countries. Figure 3 plots the estimated country-specific elasticities for our sample. For example, the estimated elasticity for France is 0.17, which is 0.38 percentage points lower than the U.S. elasticity of 0.55. While the service sector's share of total hours grew by an average of 2.13 percent in the U.S. and 3.8 percent in France, had France exhibited the same elasticity as the U.S., its female employment share would have grown by 1.44 percentage points more—more than half of its actual growth rate of 2.64 percentage points.

The significant and statistically meaningful cross-country variation in the relationship between service sector expansion and female employment is an important finding. It suggests that certain factors either mitigate or amplify the effect of service sector growth on female market work. Identifying these factors is crucial for understanding what lessons can be drawn from countries with high female employment shares. To explore potential

[3] See Section A1 for details.

explanations, we compute the correlation between country-specific elasticities and a set of relevant variables.[4]

Our analysis first establishes a strong correlation between country-specific elasticities and between-sector contributions (Figure 4a). This suggests that the strength of structural transformation plays an amplifying role in how effectively the service sector draws women into the workforce. Notably, the share of female employment in business services emerges as a key factor: in countries with a higher female share in business services, service sector growth is more effective in drawing women into the workforce (Figure A2a). One possible explanation is that business services employ a relatively more educated female workforce and require longer hours, which in turn generates additional demand for services that substitute home production, further contributing to female employment growth. Indeed, we find that countries with higher female employment in business services also experience larger share of food and accommodation services (Figure A2b). These findings suggest that the extent to which structural transformation increases female employment is amplified through marketization channel. While service sector expansion generally facilitates female labor force participation, the composition and evolution of service sub-sectors also play a crucial role in shaping this relationship.

A vast body of literature explores the increase in female market work observed in developed countries over recent decades.[5] Our work contributes to the strand that links this rise to the expansion of the service sector, as discussed in Goldin/Schultz (1995), Olivetti/Petrongolo (2016), Ngai/Petrongolo (2017), and Ngai/Olivetti/Petrongolo (2024) (also see references therein). Our first contribution is to extend the evidence presented in Olivetti/Petrongolo (2016), which supports the positive link between service sector growth and female labor force participation, by using more recent data covering a larger and more diverse set of countries. While Olivetti/Petrongolo (2016) primarily focuses on developed European nations and covers the period from the 1970s to 2005, our dataset begins in 1983 and extends to 2019. Additionally, we incorporate Eastern and Northern European countries, which have experienced varying changes in female employment shares, thereby enriching the sample and allowing for a broader analysis.

The existing literature generally assumes a causal relationship that runs from service sector expansion to female labor force participation. However, a recent study by Kuhn/Manovskii/Qiu (2024) argues for the reverse causality—that an increase in female labor supply can drive structural transformation. Our analysis does not provide a causal relationship per se, but rather focuses on cross-country variation in this relationship. Even if

[4] Specifically, we use EU-LFS data to calculate sectoral shares and female shares within service sub-sectors, European Union Survey of Income and Living Conditions (SILC) data to examine the gender wage gap, sectoral wages, and the share of college graduates in the labor force, and Current Population Survey data for comparable U.S. measures. For further details, see A1.

[5] For instance, see Blau (2025) for a recent documentation of gender inequality in the US.

we were to adopt the perspective of Kuhn/Manovskii/Qiu (2024) and model service sector expansion as the dependent variable, our findings on cross-country variation in elasticity would still hold. We interpret this as further confirmation for the need for further research to better understand the relationship between these two dynamics.

To the best of our knowledge, this paper is the first to systematically examine the extent of cross-country variation in the association between service sector expansion and female market work. While several studies explore differences between the U.S. and Europe in structural transformation and employment reallocation (see, for instance, Gottlieb et al. (2024) and Rogerson (2008)), relatively little research investigates how the service sector and female employment are interrelated. One notable exception is Rendall (2018), which argues that tax regimes can incentivize female labor market entry, leading to increased demand for market services and further service sector expansion.

The remainder of the paper is structured as follows. Section 2 presents the shift-share decomposition. Section 3 estimates the service sector elasticity of the female share of total hours worked. Section 4 explores potential factors contributing to cross-country variation in these elasticity estimates. Finally, Section 5 concludes.

2 Shift-Share Decomposition

We start our analysis with a shift-share decomposition to show the contribution of structural transformation to the female share of total hours. We use data from the European Union Labor Force Survey from 2000 to 2019.[6] For the US, we use Current Population Survey data. We define three major industry groups; agriculture, industry, and services.[7] We treat agriculture as a separate sector instead of combining it with industry, as Eastern European countries started the period with an average agriculture share of 13.6 percent and ended it with an average of 7.1 percent. Other countries had averages of 5.6 and 3.7 percent, respectively.

Let h_{ft} be the share of total hours worked by females in year t. Moreover, let h_{jt} be the share of total hours worked in sector $j \in \{a, g, s\}$, where a represents agriculture, g represents industry and s represents services. Similarly, h_{jft} is the share of total hours in sector j worked by females. We can then decompose the change in female share of total hours into

[6] The survey starts earlier for some countries. To maintain a balanced panel, we begin the sample in 2000. See the Appendix for details.
[7] Details of sector classifications are in A1.

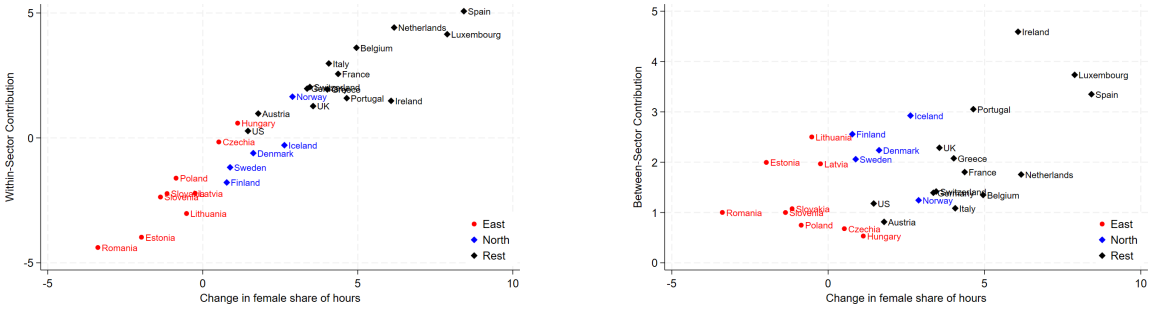
within-sector and between-sector contributions using the following formula:

$$\Delta h_f = \sum_j \omega_{fj} \Delta h_j + \sum_j \omega_j \Delta h_{fj}, \tag{2.1}$$

where $\omega_{fj} = (h_{fj}^{t+n} + h_{fj}^{t})/2$ and $\omega_j = (h_j^{t+n} + h_j^{t})/2$ are decomposition weights, $\Delta h_j = h_j^{t+n} - h_j^{t}$ and $\Delta h_{fj} = h_{fj}^{t+n} - h_{fj}^{t}$ are employment share changes, t is the beginning year, and $t+n$ is the end year, and n is 19 in our analysis. The first component represents the between-sector component, while the second term represents the within-sector component.

The first key observation in our shift-share decomposition is that between-sector changes contributed positively to the increase in the female share across all countries in our sample (Figure 2b). On average, we find a 2.3 percent increase in the female share of total hours from 2000 to 2019. (see the last panel of Table A3). Of this rise, 1.9 percent was due to the reallocation of hours between sectors, while 0.4 percent was due to within-sector changes in female shares of total hours. Hence, structural transformation (the between-sector factor) explains 80 percent of the increase in female share of total employment. Olivetti/Petrongolo (2016) find that between-sector factors account for 57 percent of the increase in female share. Our analysis includes a larger set of countries and a different time period. When we perform the shift-share analysis for the subset of countries also included in Olivetti/Petrongolo (2016), we find that 2 percent of the 3.8 percent increase is attributed to between-sector factors (Sample 1 averages in Table A3). This 53 percent is quite close to the findings of Olivetti/Petrongolo (2016), even though we include data for more recent years. [8]

Figure 2: Between and Within Sector Changes and Female Share



(a) Within-Sector Contribution **(b) Between-Sector Contribution**

Source: European Union Labor Force Survey (EU-LFS) and IPUMS-CPS for the US covering 28 countries for years 1983 to 2019, and it is an unbalanced panel. See Section A1 for more details.

Second, we find that within-sector contributions are stronger in developed continental European countries but smaller (or even negative) in Eastern and Northern European

[8] Olivetti/Petrongolo (2016) have Australia, Canada, Japan and Korea, which are absent in our sample.

countries[9] (Figure 2a). Between-sector factors contribute more significantly to the rise in female shares in our data, which is in contrast to what Olivetti/Petrongolo (2016) find (see the last panel of Table A3). This is precisely because within-sector contributions in these countries are negative. This observation aligns with Alon/Coskun/Olmstead-Rumsey (2025) who report higher sectoral segregation in countries with high female participation, driven by the within-sector component. Overall, our data confirms the positive association between structural transformation (the reallocation of labor from other sectors to services) and the rise in the female share of hours.

3 Service Sector Elasticity of Female Market Work

Shift share analysis above confirms that the rise of services (between-sector reallocation) significantly contributed to the increase in the female share of total hours. Now, we turn to the strength of that contribution across countries. To do so, we estimate the service sector elasticity of female share of hours using the following regression:

$$\Delta ln(f_{it}) = \alpha + \beta_1 \Delta ln(s_{it}) + \gamma_i I_i + \beta_{2i} I_i * \Delta ln(s_{it}) + \delta_{1t} I_t + u_{it}, \tag{3.2}$$

where i represents the country, t represents time, I_i is the country dummy variable, I_t is the year dummy variable, $\Delta ln(f_{it})$ and $\Delta ln(s_{it})$ are the growth rates of female share of hours and the service share of hours, respectively. β_1 represents the percentage change in the female share associated with one percent change in the service share for the reference country (the US). We expect that $\beta_1 > 0$. β_{2i} captures the additional change in the female share for country i compared to the US. Hence, the service sector elasticity of the female share of hours for any country i is given by $\beta_1 + \beta_{2i}$. We aim to explore the extend to which β_{2i} varies across countries. As the link between the rise of services and the increase in female employment is often attributed to women's comparative advantage in the service sector due to gender traits, a cross-country variation in elasticity suggests that factors beyond gender traits amplify or mitigate the effect of service sector expansion on the female share of hours. We should note that we do not interpret this association as a causal relationship. Instead, we use it to highlight cross-country variation in the relationship between these two variables[10].

[9] We include the UK and Ireland in this category because data suggests so.

[10] In fact, when we run the same regression with the service share as the dependent variable and the female share as the independent variable, similar to Kuhn/Manovskii/Qiu (2024), we obtain comparable results.

The estimation results are displayed in Table 1. We find $\beta_1 = 0.55$ (specification 3), meaning that a one percent increase in the service share of hours raises the female share by 0.55 percent. We also run regressions with different specifications. Without year fixed effects, we find a lower elasticity, but our main finding of cross-country variation in elasticity remains. When we include the growth rate of the female share in service and industry employment, we obtain a similar coefficient for the US while the cross-country variation (β_{2i}) increases. Moreover, we observe that the US has one of the highest elasticity values.

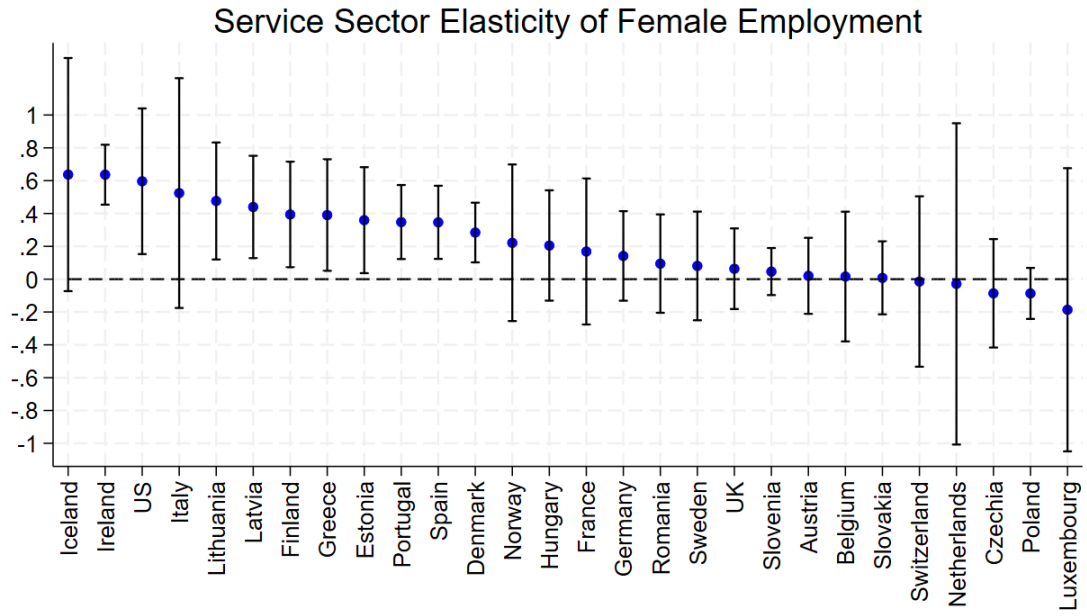
We report the elasticity estimation for each country ($\beta_1 + \beta_{2i}$) for specification 3 (the main estimation in our analysis), together with their confidence intervals in Figure 3. This figure highlights the cross-country variation in the service elasticity of the female share. For instance, we estimate the elasticity for France to be 0.17 which is 0.38 lower than the US elasticity. The service sector's share of total hours grew, on average, by 2.13 percent in the US and 3.8 percent in France. Had France exhibited the same elasticity as in the US, the growth in its female share of total hours would have been 1.44 percentage points higher (55 percent more) than its actual growth rate of 2.64 percent. In summary, our analysis demonstrates substantial cross-country variation in the service elasticity of the female share of hours. This variation has important quantitative implications for understanding the impact of service sector growth on increasing female employment shares.

Table 1: Elasticity Estimation Results

	(1)	(2)	(3)	(4)	(5)
services share	0.339***	0.241***	0.550**	0.441***	0.539***
	(0.096)	(0.063)	(0.206)	(0.132)	(0.048)
female share within services				0.619***	0.729***
				(0.034)	(0.024)
female share within industry					0.100***
					(0.008)
Year fixed effects	No	Yes	Yes	Yes	Yes
Interaction terms	No	No	Yes	Yes	Yes
N	532	532	532	532	532

Notes: All variables are growth rates and the dependent variable is the growth rate of female share in total hours. Standard deviations are reported in parentheses. */**/*** denotes significance at 10/5/1 percent levels.
Source: CPS for the US and from EU-LFS for other countries and the sample is from 2000 to 2019.

Figure 3: Estimation Results - Country Elasticities



Notes: Dots are estimates of the service share elasticity of the female share of employment. Baseline country is the US, values for all other countries is the baseline coefficient added to the interaction term. Bars are 95% confidence intervals.

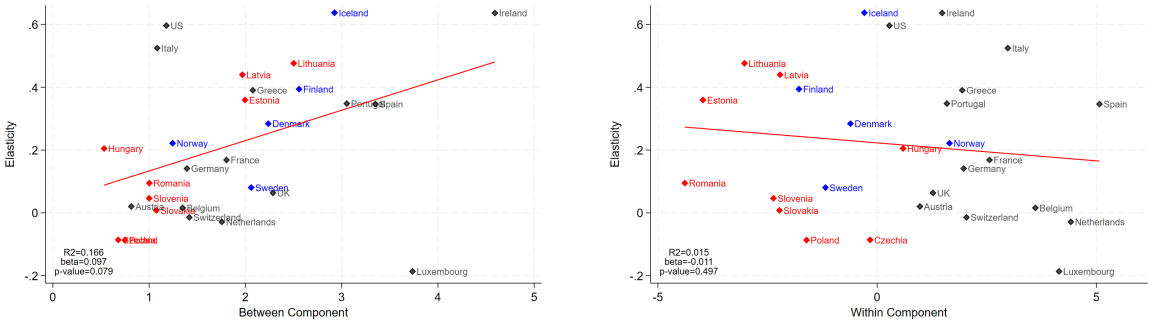
Source: CPS for the US and from EU-LFS for other countries. Sample is from 2000 to 2019.

4 Exploring Cross-Country Variation in Services Elasticity of Female Employment

In this section we explore the relationship between country elasticities and various factors that may help explain their variation. First, we examine how between- and within-sector forces correlate with cross-country elasticities. In Figure 4a, we show that there is a relationship between the strength of structural transformation and elasticity- specifically, in countries where sectoral reallocation is stronger, elasticity tends to be higher. We discuss this finding in more detail below. In contrast, Figure 4b shows no significant association between elasticities and within-sector forces.

Since we find that a larger expansion of services is associated with a higher elasticity, we examine whether the composition of the services sector contributes to cross-country variation in elasticity. To do so, we regroup service sub-sectors into five categories: (i)

Figure 4: Elasticity - Between and Within Component



(a) Between Component **(b) Within Component**

Notes: Vertical axis is the services elasticity of female employment. Variables in horizontal axes are contributions estimated from shift-share decomposition.
Source: CPS for the US and from EU-LFS for other countries. Sample is from 2000 to 2019.

wholesale and retail trade, (ii) accommodation and food services activities, (iii) health and education, (iv) public administration and defense, and (v) all remaining sub-sectors[11]. The remaining sub-sectors primarily consist of business related services such as administrative and support services, financial and insurance activities, telecommunication and information services. We refer to this category as business services. Data at this aggregation level is available starting from 2008 in the European Labor Force Survey.[12] We examine the correlations between the elasticity and both the average shares of these sub-sectors in total services and the average shares of females within these sub-sectors.

We find that the average female share within business services stands out; in countries with a high average female share in business services, service sector growth has pulled more women into the workforce (Figure A2a). This result is not driven by either the level or the change in the share of business services in total service hours.[13] Female intensities in other sub-sectors do not show a significant correlation with elasticity. We also find that countries with a higher female share in business services tend to have a higher share of food and accommodation in total service hours. This relationship suggests that increased female employment in business services may contribute to the relative expansion of the food and accommodation sector. One possible explanation is that higher demand for market-based food services could result from longer working hours or higher educational requirements in business services. Additionally, we observe that as the share of food and accommodation services in total services increases, so does the elasticity (Figure A2b). Taken together with the fact that female intensity in food and accommodation services is high (Table A2), these findings suggest that the extent to which structural transformation pulls women into the workforce is amplified through business services, as it affects the marketization channel. As

[11] See Appendix Section A1 for the details.
[12] Table A2 reports summary statistics for these variables.
[13] In countries with a stronger change in female intensity within business services, elasticity was lower.

services sector expands, sub-sectors within it grow as well. An expansion in business services further stimulates growth in the food and accommodation sub-sector. Since half of the total hours worked in this sub-sector belong to women, this leads to additional growth in female market work. Furthermore, we find that public administration and defense services are negatively associated with the service elasticity of female hours (Figure A2c). We believe this relationship is unlikely to be driven by public administrative sector itself. Instead, it may reflect how changes in business services and food and accommodations services shares are absorbed by this sector.

We also consider other factors associated with female employment. We investigate the relationship between elasticities and both the change and the level of average college graduate rates (Figure A4) and find no significant correlation. Similarly, we find no clear link between average gender wage gaps and elasticities (Figure A3).

5 Conclusion

This paper investigates the relationship between the growth of the service sector and female employment in a cross-country context. The leading explanation in the literature is that structural transformation (reallocation of labor to services) leads to higher female employment. We provide further evidence on this by analyzing data from a set of countries with divergent structural transformation experiences over a recent time period. Using a shift-share analysis, we find that 80 percent of the increase in the female share in total hours is attributable to between-sector factors (structural transformation).

Why would the rise of the service sector draw more women into the workforce? The conventional wisdom is that women have a ”comparative advantage” in the service sector due to gender traits that make them more employable in services. As a result, as service sector expands, female employment should increase. One implication of this view is that the strength of this effect should be the same across countries since gender traits are universal. However, our findings reveal substantial variation in the service sector elasticity of the female share of total hours, highlighting the interplay of other factors that influence the strength of this relationship.

To explore this variation, we examine the association between country elasticities and potential explanatory factors. We find that the magnitude of labor reallocation (between-sector factors) itself is correlated with high elasticity: countries that experienced larger reallocation also had higher elasticities. Additionally, in countries where business

services had a high average female hour intensity, the food and accommodation sector- which has a high female share of total hours- is also larger. This suggests that countries with larger labor reallocation tend to develop larger business service sector, which not only employ a significant number of women but also contribute to the expansion of food and accommodation services, further increasing female market participation. We conclude that the strength of the relationship between service sector expansion and female employment growth extends beyond gender traits and warrants further investigation.

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Appendix

A1 Data

We use various data sources in this paper. Most of the data for the European countries is from the European Union Labor Force Survey. For the US, we use Current Population Survey. Table A1 shows the data availability for each country.[14] Within a survey, the sample is all employed individuals between ages 20 to 64, for whom industry is defined. We define three major industry groups; agriculture (agriculture; hunting; forestry and fishing), industry (mining and quarrying; manufacturing; electricity, gas and water supply; construction), and services (all the remaining sectors). We compute sectoral shares of total hours worked, overall female share and within-sector female shares of total hours worked. To construct these share series, we use employment and actual hours worked per week series. As EU-LFS became quarterly only after 2005, and due to the timing of the survey actual hours worked might give biased results in countries where the survey corresponds to vacation weeks as discussed in Bick/Brüggemann/Fuchs-Schündeln (2019). To address this issue, we apply the adjustments mentioned in Bick/Brüggemann/Fuchs-Schündeln (2019) to construct our hours measure. Sample averages are reported in A2.

Table A1: Countries in Our Sample with Start Years

Austria-1995	Germany-1983	*Lithuania-1998*	*Slovakia-1998*
Belgium-1983	Greece-1983	*Luxembourg-1983*	*Slovenia-1996*
Czechia-1997	*Hungary-1996*	Netherlands-1983	Spain-1987
Denmark-1983	*Iceland-1995*	*Norway-1995*	*Sweden-1995*
Estonia-1997	*Ireland-1983*	*Poland-2000*	*Switzerland-1996*
Finland-1995	Italy-1983	Portugal-1986	UK-1983
France-1983	*Latvia-1998*	*Romania-1997*	US-1983

Notes: Countries in *italics* are the sample that we have and Olivetti/Petrongolo (2016) does not. Australia, Canada, Japan, Korea are in their sample and not in ours.

Subsectors of services are only available after 2008. We group sectors from NACE classification codes to end up with five main subgroups of services. We have “food and accommodation” (I - Accommodation and Food Service Activities), “trade” (G - Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles), “education and health services” (Q - Education and R- Human Health and Social Work Activities are), “public administration” (P - Public Administration and Defence; Compulsory Social Security), and “business services” (H -Transportation and Storage; J - Publishing, Broadcasting, and Content Production and Distribution Activities; K - Telecommunication, Computer

[14] US has data for earlier years, but since the earliest European Labor Force Survey is in 1983, we use the same year for the US as well.

Table A2: Summary Statistics

	Mean	Std	Values for Beg	Values for End	Correlation with Elasticity
Female Share	0.41	0.04	0.40	0.42	0.25
Services Share	0.67	0.08	0.62	0.70	0.09
Female Share Within Services	0.50	0.05	0.49	0.51	0.21
Sector Shares Within Services					
Business	0.35	0.04	0.35	0.36	-0.27
Educ-Health	0.26	0.05	0.25	0.27	0.04
Trade	0.21	0.05	0.23	0.20	0.24
Public	0.11	0.02	0.11	0.10	-0.50
Food-Accomm.	0.06	0.03	0.06	0.07	0.35
Females Shares Within Services Subsectors					
Educ-Health	0.74	0.05	0.74	0.75	0.22
Food-Accomm.	0.53	0.10	0.55	0.52	0.17
Trade	0.45	0.07	0.44	0.44	-0.10
Public	0.45	0.07	0.43	0.44	-0.10
Business	0.37	0.04	0.37	0.37	0.40

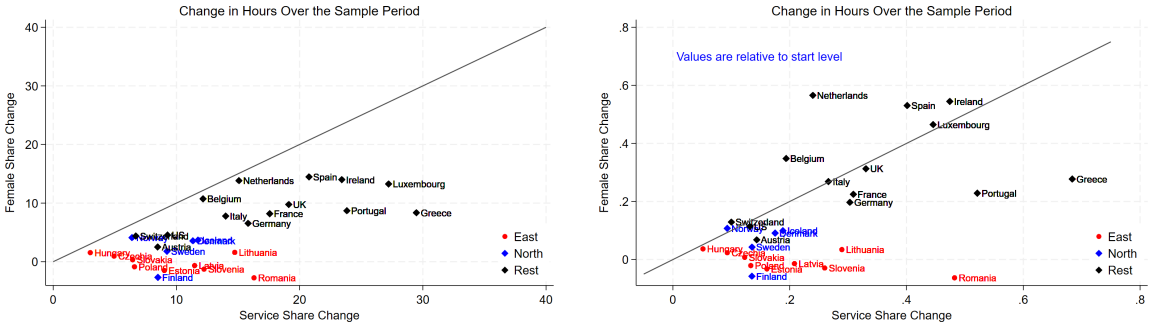
Notes: The main sample is 2000 and 2019, subgroups of services is from the sample of 2008-2019. Beginning values indicate the sample average in 2000 for female share, services share and within services female share; and 2008 for the rest of the variables. The end value indicates the sample average in 2019. Elasticity correlation is the cross-country correlation of each variable with the elasticity measure shown in Figure 3.

Source: European Union Labor Force Survey.

Programming, Consulting, Computing Infrastructure, and other Information Service Activities; L - Financial and Insurance Activities; M - Real Estate Activities; N - Professional, Scientific and Technical Activities; O - Administrative and Support Service Activities; S - Arts, Sports and Recreation; T - Other Service Activities; U - Activities of Households as Employers; Undifferentiated Goods and Services Producing Activities of Households for Own Use). We also use European Union Survey of Income and Living Conditions (SILC) data between 2004-2019 to compute gender wage gap, sectoral level wages and college graduate fraction in the labor force. Our sample is prime age individuals between 25-54, whose income is defined, who work at least 10 hours a week and who worked at least 6 months in the past year, in order to estimate wages properly. We also complement our sample by adding the US data from IPUMS-CPS, and our sample coverage is all employed individuals between 18-65 whose industry is defined.

A2 Supplementary Figures

Figure A1: Change in Female and Service Shares of Total Hours

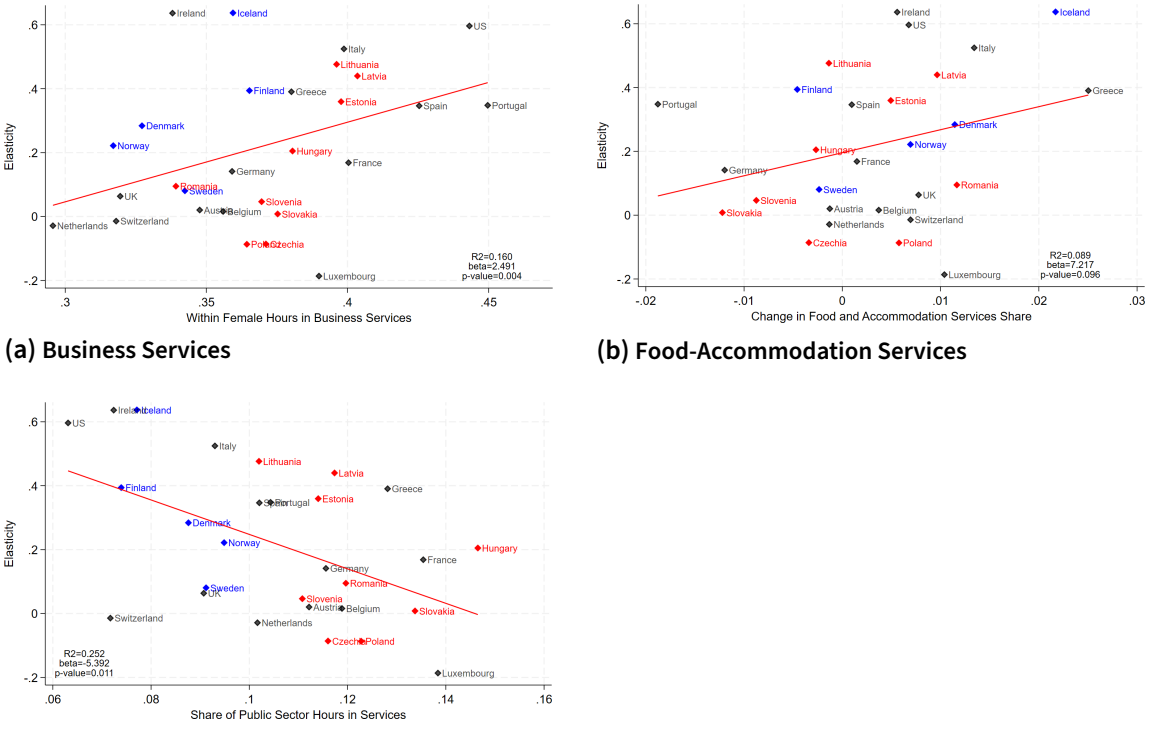


(a) Differences **(b) Differences / Beginning Year Values**

Notes: Female share is computed as the the share of female aggregate hours in total aggregate hours worked, and services share is the aggregate hours worked in service sector as a share of total aggregate hours. Values in panel (b) are percentage point change from the beginning year to the end year for each country.

Source: European Union Labor Force Survey and Current Population Survey.

Figure A2: Elasticity and Sub-sectors of Services



(a) Business Services **(b) Food-Accommodation Services**

(c) Public Administration Services

Notes: Sector shares are the averages of 2008-2019.

Source: European Union Labor Force Survey data and Current Population Survey (CPS) data from 2000 to 2019.

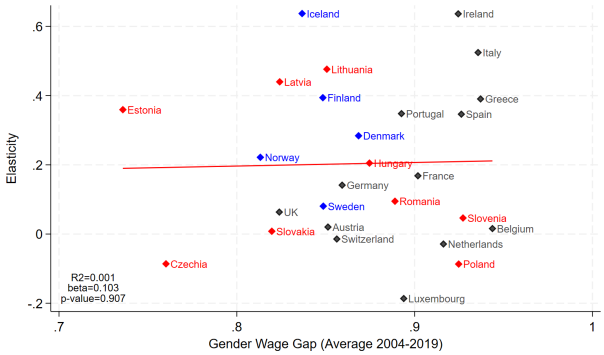
Table A3: Shift-share Analysis: Time Series - Results

Country	Gender share			Decomposition Goods/Services/Agri	
	Start	End	Change	Between	Within
Sample 1					
Austria	37.6	39.4	1.8	0.9	0.9
Belgium	36.6	41.5	5.0	1.4	3.6
Denmark	41.1	42.7	1.6	2.2	-0.6
Finland	43.6	44.3	0.8	2.6	-1.8
France	40.2	44.6	4.4	1.8	2.6
Germany	36.4	39.7	3.4	1.4	1.9
Greece	34.4	38.4	4.0	2.1	1.9
Italy	32.7	36.7	4.1	1.1	3.0
Netherlands	32.2	38.3	6.2	1.8	4.4
Portugal	42.2	46.8	4.6	3.2	1.5
Spain	33.3	41.7	8.4	3.4	5.1
UK	37.4	41.0	3.6	2.3	1.2
US	43.0	44.5	1.5	1.3	0.1
Sample 2					
Czechia	40.1	41.1	1.0	1.2	-0.3
Estonia	46.8	45.3	-1.5	2.4	-3.9
Hungary	42.0	43.5	1.5	0.9	0.7
Latvia	47.5	46.8	-0.7	2.6	-3.3
Lithuania	46.1	47.7	1.6	3.1	-1.5
Poland	41.7	40.8	-0.9	1.1	-1.9
Romania	43.8	41.0	-2.8	1.5	-4.2
Slovakia	42.6	42.9	0.3	2.0	-1.6
Slovenia	44.0	42.8	-1.3	2.5	-3.8
Iceland	37.0	40.7	3.7	3.9	-0.2
Ireland	25.7	39.7	14.0	7.4	6.6
Luxembourg	28.5	41.8	13.3	7.9	5.3
Norway	38.3	42.4	4.1	2.1	2.0
Sweden	41.5	43.3	1.8	3.1	-1.3
Switzerland	33.9	38.2	4.4	1.5	2.9
Averages					
Sample 1	37.7	41.5	3.8	2.0	1.8
Sample 2	41.5	42.5	1.1	1.9	-0.8
All	39.7	42.1	2.3	1.9	0.4

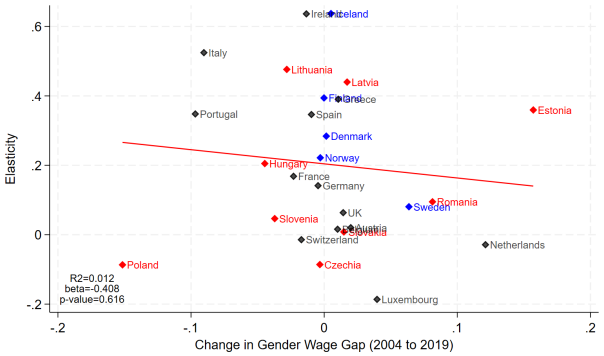
Notes: This analysis uses data between 2000 and 2019. Sample 1 included countries that are common across this study and Olivetti/Petrongolo (2016), while Sample 2 countries are present in this study.

Source: Data source is European Union Labor Force Survey.

Figure A3: Elasticity and Gender Wage Gap



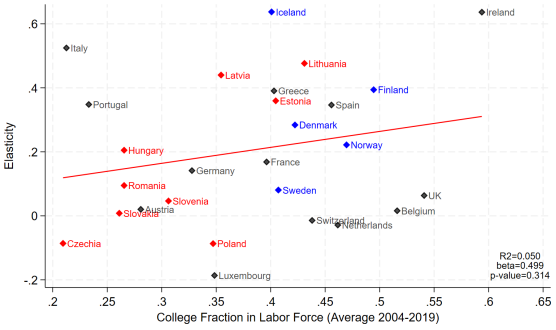
(a) Gender Wage Gap



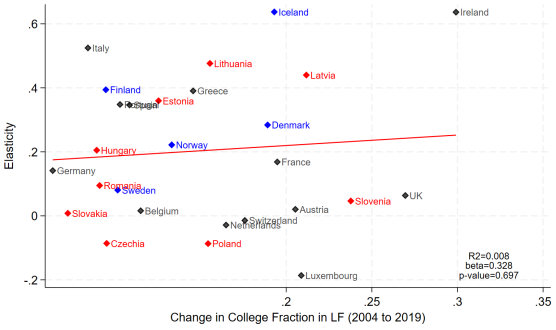
(b) Change in Gender Wage Gap

Source: Authors' calculation using EU-SILC data from 2004 to 2019.

Figure A4: Elasticity and College Fraction



(a) College Fraction



(b) Change in College Fraction

Source: Authors' calculation using EU-SILC data from 2004 to 2019.

List of Figures

List of Tables

Imprint

IAB-Discussion Paper 08|2025

Publication Date
June 2025

Publisher
Institute for Employment Research
of the Federal Employment Agency
Regensburger Straße 104
90478 Nürnberg
Germany

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Website
https://www.iab.de/en

ISSN
2195-2663

DOI
10.48720/IAB.DP.2508

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