What Factors Determine the Gender Gap in Labor Force Participation and Wages among Refugees in Germany?

By

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Submitted to

Central European University

Department of Economics and Business

In partial fulfilment of the requirements for the degree of

Master of Arts in Economic Policy in Global Markets

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Vienna, Austria

2023

Abstract

I use the German Socio-Economic Panel (SOEP) data on refugees who applied for asylum in Germany from 2013-2016 to understand the factors influencing the gender gap in their employment. More specifically, I use the simple regression analysis method to look at the effect of age, education and marital status on the gender gap in labor force participation (LFP) and wages among these refugees. The findings reveal that age is the key determinant of gender gap in both LFP and wages. I provide evidence that the gender gap in LFP and wages for young is smaller (in absolute values) than for old. Additionally, I confirm that the gender wage gap for the married refugees is higher (in absolute values) than for the singles, indicating that marital status is a significant determinant of the gender wage gap among refugees. These findings suggest that policy makers can develop interventions and policies to address these specific barriers, and promote gender equality in LFP and wages among refugees.

Key words: labor force participation, wage, gender gap, refugees, Germany

Acknowledgements

I would like to express my deepest gratitude to my supervisor, Professor Tímea Laura Molnár, for her unwavering support and guidance throughout my research process. I would also like to thank my family, friends, and my cohort for their love, encouragement, and assistance during this process.

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1 Introduction

The mass displacement of millions of individuals from their home countries, driven by diverse circumstances and the search for safety and protection poses significant challenges as refugees navigate the process of resettlement and adaptation within new societies. Integration into the society extends beyond linguistic proficiency and the completion of integration courses; it encompasses the labor force participation (LFP) of refugees and the imperative to narrow the gap in wages, both among refugees themselves and in comparison to native populations. Therefore, ensuring equitable labor force participation among refugees, irrespective of their social status, gender, or country of origin, not only serves the interests of these individuals but also presents a significant policy concern for host nations and policymakers.

According to UNHCR, there are 32.5 million refugees and 4.9 million asylum seekers worldwide (as of mid 2022), and I had been one of those refugees. This personal experience has deepened my understanding of the challenges faced by refugees and the importance of addressing their socio-economic integration. Despite the availability of several well-conducted empirical studies exploring the gender gap in LFP and wages within various societies, there has been less attention devoted to research focused specifically on refugees residing in Europe. Thus, a deeper comprehension of the determinants that influence refugees' engagement in the labor force is important in shaping improved policies related to migration, integration, labor market regulation, and economic welfare.

My research question is “What factors determine the gender gap in labor force participation and wages among refugees in Germany?” Through my study, I demonstrate the existence of gender gap in LFP and wages among refugees in Germany. I investigate this relationship by estimating models with Ordinary Least Squares (OLS) method firstly for LFP and later for wages. For this study, the different economic models with inclusion of different

independent variables are estimated with heteroskedasticity- robust standard error estimation and year fixed effects in the models.

In section 2, I give essential background information about my research topic and provide an overview of related literature. Within section 2.1, I share statistics about the number of refugees all over the world. I also describe the resettlement programs and explain what they aim to achieve. Additionally, I discuss the obstacles and factors that affect the labor market integration of refugees worldwide.

In section 2.2 I review the literature on the gender gap in the labor market integration of refugees. This section sheds light on the existing gap between genders, exploring the reasons behind such variations. I briefly discuss various hypotheses that aim to discuss this gender gap. Additionally, I present the key findings from related studies that explain the gender gap in LFP and wages.

The focus of my study is to determine the gender gap in the labor market of refugees in Germany. Therefore, in section 2.3, I review the findings of authors who have studied a similar topic in the context of the German labor market. I also describe the methods and data that they have used in their research. This overview is important as it provides me with a better understanding of the labor market integration in Germany, specifically concerning refugees. It helps me identify any existing gaps and enables me to address them in my own research.

In section 3, I provide an overview of my dataset, IAB-BAMF-SOEP refugee sample (since 2016) from German Socio-Economic Panel (SOEP) along with explanations on how each variable is measured, generated, and described. For this analysis, I use the Moving on to section 4, I discuss the research design of my study. This section consists of two subsections. Firstly, I introduce the different economic models. Second, in section 4.2, I outline the methodology and address the issue of heterogeneity to ensure the robustness of my study.

In section 5, I present the results and findings of my study. The findings confirm the presence of gender gap in both wages and LFP among refugees in Germany. Furthermore, I find the gender gap to vary by age and marital status, but not with education. The result of all estimation models with and without control variables confirm this result.

In section 6, I highlight the importance of age and marital status as determinants of existing gender gap among refugees in Germany. I provide justifications for these findings, exploring the underlying reasons. Moreover, I recommend some policies that policy makers can implement to address these barriers and promote gender equality in LFP and wages among refugees. Lastly, I acknowledge the limitations of my study and identify potential areas for further research.

2 Background and Literature Review

2.1 Refugee flows, the resettlement experience, and labor market integration

In recent years, there has been a significant increase in the number of people who have been forced to leave their homes and relocate. According to the United Nations High Commissioner for Refugees (UNHCR), by the end of 2021, 89.3 million people had forcefully been displaced from their homes (UNHCR 2021). Of these, about 53.2 million were internally displaced, whereas 27.1 million were refugees seeking resettlement in a host country and 4.6 million were asylum seekers. As per the United Nations Convention on Refugees, a refugee "is someone who is unable or unwilling to return to their country of origin owing to a well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group, or political opinion" (UNHCR 2023).

Regarding the refugee crisis specifically in Europe, by end of 2016, 5.2 million refugees and migrants had arrived in Europe (UNHCR 2023) and among all European countries, Germany emerged as a major destination, hosting 1.24 million refugees and 233,000 asylum seekers by mid-2021, making it the largest recipient country for refugees in Europe (UNHCR, 2023). Consequently, efforts for resettlement must expand on a global scale to provide these significant numbers of refugees with the opportunity to regroup and rebuild their lives, fostering a sense stability. Furthermore, Vijaya (2020) argues that the focus of the refugees' resettlement process is to facilitate refugees' integration into the labor force and attain economic self-reliance. The emphasis on self-sufficiency and employment is a crucial goal of the resettlement process in OECD countries, as it directs attention towards achieving employment and fostering economic integration outcomes (Vijaya, 2020). However, achieving this goal is not straightforward.

Numerous studies in the literature have identified that refugees face significant challenges in securing employment, particularly in many Western countries (Hooijer & Picot, 2015). According to Schwenken (2021), refugees encounter difficulties entering job market due to the need for strong language skills, suitable job matching, and the recognition of their education and job credentials. Additionally, Dadush (2018) highlights the influence of host country policies, work opportunities, and support on shaping refugee economic outcomes.

Furthermore, educational achievement poses a major challenge for refugees, with those holding higher education degrees experiencing greater difficulties in finding high-skill jobs (European Commission, 2011). Moreover, Yu et al. (2012) discovered that job training programs for refugees often fail to align with available job opportunities, which in turn creates obstacles in finding employment. In addition, the presence of social networks, particularly those involving local individuals play a crucial role in determining the success of migrants and refugees in the job market (Yu et al., 2012).

2.2 Gender gap in labor market integration among male and female refugees

In addition to the challenges faced by all refugees, it is noteworthy that female refugees experience lower LFP rates compared to their male counterparts (Cheung & Phillimore, 2017). Various arguments and findings contribute to understanding the reasons behind this gender gap in LFP. Zschirnt and Ruedin (2016) and others refer to the situation faced by female refugees as a “double burden.” They use this term to describe the combined impact of discrimination based on both their refugee status and their gender. However, critics of the "double burden" hypothesis, such as Kotzur et al. (2017), suggest that female refugees may have an advantage in employment compared to men due to negative stereotypes primarily associated with male refugees.

Nonetheless, it is important to acknowledge that racism poses a significant concern for male refugees, particularly young ones, and even for women wearing a headscarf (Huke, 2020). In employment settings, refugees encounter racism from employers, colleagues, and clients. Interestingly, some employers, with good intentions, choose not to hire refugees to protect them from colleagues with racist attitudes (Huke, 2020). This highlights the complex interplay between gender, stereotypes, and racism in the employment experiences of refugees. Moreover, Ellemerse (2018) and Koopmans (2016) agree that gender stereotypes negatively affect the job opportunities of female refugees. Ellemerse emphasizes that stereotypes shape how female and male refugees see themselves in host countries and how others treat them, while Koopmans adds that the gender gap in employment exists because women are expected to be homemakers and men to be breadwinners in the refugees' home countries.

The integration of female refugees into the labor market presents specific difficulties attributed to factors such as lower education levels, limited skills, unequal allocation of unpaid caregiving responsibilities, and discrimination (Albercht et al., 2021). Furthermore, there are policy shortcomings and factors that contribute to the existing gender gap among male and female refugees. Insufficient access to childcare facilities and inadequate work-family balance policies add to the challenges faced by female refugees in their efforts to enter the workforce. The combination of gender and caregiving responsibilities for young children emerges as a crucial element affecting their participation in the labor market (Budig et al., 2016; Bonoli, 2013; Schwenken, 2021). In addition, female refugees encounter additional responsibilities concerning household and childcare duties, which further compound the difficulties they experience during the integration process (Albercht et al., 2021).

Female refugees also face lower labor force participation rates compared to male refugees due to factors such as limited skills, unequal distribution of unpaid care work, and

discrimination (Albercht et al., 2021). Recruiters tend to prefer female refugees over male refugees in equal circumstances, but this preference diminishes when children are involved, as both genders are considered equally employable (Fossati et al., 2022). Discrimination levels vary among refugees, with recent immigrants facing more challenges in recruitment compared to long-established refugees (Froehlich & Schulte, 2019). The motherhood penalty hypothesis suggests that refugee mothers are perceived as less employable compared to childless women, while the fatherhood advantage hypothesis indicates that refugee fathers are viewed as more employable than childless men due to reduced perceived threat (Fossati et al., 2022).

2.3 LFP of refugees in German job market

Germany distinguishes itself through its substantial inflow of refugees since 2014 and the concerted efforts of state agencies, employers, and civil society, including trade unions, to facilitate labor market integration with a particular focus on promoting early integration into the labor market (Schwenken, 2021). However, in Germany, like in other European countries, refugees encounter unique difficulties compared to native citizens and other migrants (Schwenken, 2021).

Despite overall progress in refugees' labor market integration, women experience less favorable outcomes compared to men. For new comer refugees the gender gap in employment rate is 7 percentage points (Kosyakova et al., 2022). Work opportunities for refugees in Germany are influenced by various factors, including the country of origin, local labor market conditions, and discretionary decisions by relevant authorities regarding work permissions (Schwenken, 2021). Additionally, challenges such as finding jobs that match their qualifications and proficiency in the German language further hinder their labor market integration. The experiences of loss of status and racism also impact the integration of refugees (Schwenken, 2021). Variances in educational and vocational systems between their countries

of origin and the host country can result in qualifications being undervalued, while limited resources and networks pose further obstacles to their integration (Kosyakova et al., 2022)

Female refugees in Germany face a triple disadvantage as immigrants, refugees, and women (Kosyakova et al., 2022). Gender gap in employment among refugees are influenced by differences in qualifications, with women often facing higher entry barriers due to sector-specific regulations. Inadequate access to education, training, and recognition of qualifications in the host country further contribute to these gender differences (Kosyakova et al., 2022). Traditional family roles and caregiving responsibilities can also restrict women's employment opportunities. Social networks and experiences of trauma also contribute to gender differences in labor market integration. Limited networking opportunities hinder women's job search and support, while higher exposure to violence and post-arrival stressors adversely affect their well-being and overall integration (Kosyakova et al., 2022).

Schwenken (2021) argues that as job qualifications become more demanding, the wage gap tends to widen. Gender pays difference exist among refugee, with women earning approximately 16 percent less than their male, even after accounting for other variables including education, experience, and parental responsibilities (Schwenken, 2021).

Kosyakova et al (2022) used the Oaxaca-Blinder decomposition method and they find factors such as human capital, care work, networks, and health as determinants for the gender gap as determinants of the gender gap for LFP and wage. However, in this paper, I use OLS and I conclude the interaction terms to capture what factors determine the gender gap.

3 Data and measurement

3.1 Data sources and sample selection

The German Socio-Economic Panel (SOEP) is an extensive longitudinal survey in Germany that has been tracking individuals and households including Germans from both Eastern and Western states, since 1984, as well as foreign residents and immigrants, providing a comprehensive snapshot of employment, occupation, and earnings (SOEP, 2022). For this study, I have utilized data from three specific samples, namely M3, M4, and M5, which are collectively referred to the IAB-BAMF-SOEP refugee sample (since 2016). These samples were created to capture the experiences of refugees who arrived in Germany between January 2013 and December 2016 and applied for asylum, as well as other members of their households (SOEP, 2022). Notably, M4 is the second part of the M3 sample, while M5 is the third boost sample of refugee households.

3.2 Measurement

The data for my study was obtained from the SOEP-Core V37 (1984-2020) longitudinal dataset. The dependent variables, as well as some independent variables, were derived from the Personal Related Status and Generated Variables datafile (PGEN) and Person- Related Meta-Dataset (PPATHL)

Specifically, the first *outcome* variable, labor force status ***(lfp)***, is based on current employment status and includes additional information on the activities of non-working individuals (SOEP Group, 2022, p.19). This variable differentiates between "working" and "non-working" categories and is represented as a generated dummy variable with a value of 1 for individuals who are currently working, and 0 otherwise. The second *outcome* variable is the logarithm form of current gross labor income ***(ln_income)*** in Euro, which estimates the gross labor income earned from the main job in the previous month by all employed SOEP

respondents in each wave (SOEP Group, 2022, p.10). I deflated this value for each year based on Germany's 2016 consumer price index (CPI) as base year. The CPI values from 2016-2020 are as 1.50%, 1.38%, 1.56%, 1.54%, and -0.57% respectively (inflation.eu, 2023). The purpose for this adjustment is to ensure that any differences observed in the values of gross income across different years are not influenced by changes in inflation. Moving on to the explanatory variables, they are obtained from the PGEN data file and are listed below:

I created ***female*** binary variable indicating whether the respondent is female or not using the Gender variable. ***Birthplace*** provides information about the respondent's birthplace. It indicates whether a person was born in Afghanistan, Syria, Iraq, or elsewhere in the world. ***Marital status*** refers to the legal or institutional state of being married or unmarried during the time of the interview (SOEP Group, 2022, p.9). I created dummy variable equal to 1 if a person is currently married, regardless of whether their partner is living with them or abroad, and 0 otherwise. I generated the ***age*** of each respondent by subtracting their birth year from the survey year. In addition, ***young*** binary dummy variable represents the age group of 18 to 24, where the variable takes a value of 1 if the respondent's age falls within this range and 0 otherwise.

Education is calculated by summing up the years of formal education and any vocational training the individual has completed (SOEP Group, 2022, p.49). ***High education*** is a binary variable that takes the value 1 if the respondent has obtained a college degree or higher, and 0 otherwise. I derived this variable from the college degree variable in the PGEN dataset.

For my study, I created a binary variable to indicate whether a respondent holds a ***skilled occupation*** using the occupational position variable, which provides comprehensive information on the current job position (SOEP Group, 2022, p.17). A value of 1 is assigned to individuals who hold skilled or high-skilled positions, while 0 is assigned to those with other

types of occupations. ***Working experience*** variable represents the overall duration of full-time work experience for the respondent until the year of the interview. It is computed by aggregating monthly data on the individual's employment status (SOEP Group, 2022, p.43).

3.3 Descriptive statistics

Table 1 presents the summary statistics of my panel data focusing on my main refugee sample, which consists of 22,552 refugees who applied for asylum in Germany between 2013 and 2016. Among these refugees, 8,875 are women and their average age is 33, consistent with the overall sample's average age. Inclusion of this substantial number of females in my sample provides a solid foundation for analyzing and exploring the gender gap in LFP and wages. The reason for the fewer observations in the logarithm of income variable is due to certain values of the gross income variable in the main dataset. This variable can take the value of –2 (does not apply), -5 (not included in questionnaire version), and –7 (only available in less restricted edition). Taking the logarithm of these values result in a reduction in the number of observations.

The variable representing education, which measures the years of education and training, highlights the low educational attainment among refugees, averaging at 7 years. Consequently, only around 16% of the refugees in my sample possess a higher education degree, defined as a college degree or a higher level of education. The finding aligns with expectations given the origin situations of the refugees. Similarly, only 481 refugees hold jobs in high-skilled occupations, providing evidence that most refugees are employed in low-skilled jobs.

Table 1: Descriptive statistics

	observation	Mean	Standard deviation	Range Min	Range Max
lfp	22,552	.22	.41	0	1
ln_income	4,864	6.83	.94	0	8.91
female	22,552	.39	.49	0	1
birthplace	22,552	2.62	.95	1	4
maarital status	22,552	.61	.49	0	1
age	22,552	33.88	11.31	7	93
young	22,552	.24	.43	0	1
education (education or training in years)	22,552	7.51	3.94	-2	18
high education	22,552	.16	.36	0	1
skilled occupation	22,552	.02	.14	0	1
work experience	22,552	6.68	9.36	-1	50

4 Research Design

In this part, I will outline my research design to answer the question of "What factors determine the gender gap in LFP and wages among refugees in Germany." In section 4.1 I will present both a simple model and an expanded version to describe my models. Subsequently, in section 4.2, I will elaborate on the methodology employed in this study.

4.1 Economic Models

In my estimation model, my objective is to reveal the gender gap in LFP as well as wages and this analysis includes control variables and interaction terms. To achieve this, firstly, I employ four distinct regression models with year fixed effect and without control variables. In equation 1, I examine the relationship between gender (being female) and the outcome variables using the following approach:

1. $y_{it} = \alpha_t + \alpha_1 \, female_i + \varepsilon_{it}$

I introduced year fixed effect. In this model α_t captures the baseline level of LFP and wages for male refugees in the sample assuming other variables are held constant. $\alpha_1$captures the average gender gap in the expected value of my outcome variables; LFP and wages of refugee i at time t between female and male refugees. The error term, ε_{it}represents all unobserved factors that may influence the outcome variables but are not in the models.

In estimation 2-4, I have included three different interaction variables between female and young, married, and high education variables as follows:

2. $y_{it} = \beta_t + \beta_1 \, female_i + \beta_2 \, young_i + \beta_3 \, female_i \, . \, young_i + u_{it}$
3. $y_{it} = \gamma_t + \gamma_1 \, female_i + \gamma_2 \, married_i + \gamma_3 \, female_i \, . \, married_i + e_{it}$
4. $y_{it} = \kappa_t + \kappa_1 \, female_i + \kappa_2 \, high - educ_i + \kappa_3 \, female_i \, . \, high - educ_i + v_{it}$

In these equations, by incorporating the interaction variables, my aim is to test whether the association between LFP/wages and gender differs by marital status, age, and education. Secondly, I include age, age squared, marital status, skilled occupation, young, and work experience in estimation models 1-4 and I also include the year fixed effect into the models. Since I am interested in examining the relationship between being from Afghanistan, Syria, and Iraq and labor outcomes, in comparison to refugees from the rest of the world, I am including a set of dummy variables for birthplace too.

4.2 Methodology

For my thesis, I am using the simple regression analysis method, which uncovers the mean-dependence between the dependent variable and different values of another variable, x (Békés & Kézdi, 2021). Specifically, I will be utilizing linear regression, widely used in data analysis to examine the gender gap in wages and LFP.

However, it is important to address the limitation with simple standard error (SE) formula in regression analysis. This formula assumes homoskedasticity, assuming that the fit of the regression line is the same across the entire range of the independent variable. The fit may vary at different values of the independent variable, resulting in different spreads of the dependent variable around the regression line. This phenomenon is known as heteroskedasticity, and it can impact the accuracy of standard errors (Békés & Kézdi, 2021). To address the issue of heteroskedasticity, a correct SE formula called heteroskedasticity-robust formula is used in my study. This formula provides accurate standard errors regardless of whether the situation involves homoskedasticity or heteroskedasticity (Békés & Kézdi, 2021).

5 Results

In this section, I will provide a summary and interpretation of the results obtained from the various estimation models discussed in section 4.1. The aim is to analyze and understand the outcomes of these models. In section 5.1, I will present the findings related to the dependent variable of interest, which is LFP. Additionally, in section 5.2, I will focus on the results of the estimations conducted with the dependent variable being the logarithm of income.

5.1 Estimation result: labor force participation as dependent variable

This section focuses on the regression results using ***lfp*** as the dependent variable. Table 2 presents the estimation results of the economic models (equations 1-4 in Section 4.1). In this table, no control variables are included. In column 1, the findings indicate that the average share of male refugees participating in the labor force is 31 percent, and the estimate is significant at the 0.1% significance level. Additionally, the average share of female refugees participating in the labor force is 8 percent. Therefore, based on the results of Equation 1, we can conclude that female refugees are 23 percentage points less likely to participate in the labor force compared to male refugees at 0.1% significance level.

Moving on to column 2, where the interaction between female and young is added, the average share of old refugee males participating in the labor force is 20 percent, and the estimate is significant at the 0.1% significance level. Old females are 24 percentage points less likely to participate in the labor force than old males, indicating a gender gap for old refugees of 24 percentage points, and this difference is statistically significant at the 0.1% significance level. Furthermore, based on the coefficient estimate on the 'young' dummy, young male refugees are 3 percentage points less likely to participate in the labor force than old male refugees, and this difference is also statistically different from zero at the 1% level. Finally, based on the coefficient estimate on the interaction variable, the gender gap in the labor force

participation for young is by 3 percentage points smaller (in absolute value) than for old, and this difference is also significant at 1% significance level.

Next, according to column (3), the average share of male refugees with no higher education participating in the labor force is 18 percent, and this estimate is statistically significant at the 0.1% significance level. Females with no high education degrees, on the other hand, are 23 percentage points less likely to participate in the labor force than males with no high education, and this difference is statistically significant at the 0.1% significance level. Moving on to high educated refugees, the average share of high educated males participating in the labor force is 25 percent, and this estimate is statistically significant at the 0.1% level. The difference between the average LFP rates of educated males and females is 25 percentage points. In other words, educated females are 25 percentage points less likely to participate in the labor force than educated males. However, because the interaction coefficient estimate is not statistically different from zero, the gender gap in labor force participation does not depend on refugees' level of education.

Moving on to column 4, where the interaction between female and marital status is added, the results show that there is a gender gap in the (raw) average LFP rates between single males and females, accounting 24 percentage points (significant at the 0.1% level). Furthermore, the significantly (at the 5% level) positive coefficient estimate on the interaction variable between 'female' and 'married' indicates that the gender gap in labor force participation is by 2 percentage points smaller (in absolute value) for married than for single individuals.

To conclude, based on the results of estimation models 1-4 in table 2, which do not include control variables, I conclude that age and marital status are significant determinants of the gender gap in the (raw) average share of LFP, but not refugees' level of education.

*Table 2. OLS estimation results with **lfp** as dependent variable*

variable	(1)	(2)	(3)	(4)
female	-.23***	-.24***	-.23***	-.24***
	(.0049)	(.0055)	(.0053)	(.0085)
young		-.03**		
		(.0087)		
young*female		.03**		
		(.01)		
high_educ			.07***	
			(.01)	
high_educ*female			-.02	
			(.0144)	
married				-.06***
				(.0081)
married*female				.02*
				(.01)
_cons	.31***	.20***	.18***	.23***
	(.0039)	(.0063)	(.0055)	(.0071)
year fixed effect	Yes	Yes	Yes	Yes
observations	22552	22552	21746	22363

Note: This table presents the results of the OLS estimation for the dummy of lfp. Columns 1-5 depict the results of economic models 1-5. In this analysis. The models incorporate year fixed effects and consider heteroskedasticity- robust standard errors. Significance levels are indicated as follows: *p < 0.05, **p < 0.01, ***p < 0.001.

Moving forward to table 3, where I included control variables into models 1-4, we observe the following results. In column 1, the gender gap in LFP among refugees is estimated to be 21 percentage points, controlling for other variables. This estimate is statistically significant at the 0.1% level, indicating a significant gender gap even after accounting for the influence of other factors. In column 2, the interaction variable between young and female remains statistically significant at the 0.1% level. This suggests that age remains a significant determinant of the gender gap, even conditional on other factors included in the model. However, in column 3 and 4, the interaction variables related to marital status and education do not show statistical significance. This implies that marital status and education are not key determinants of the gender gap, after considering the influence of other variables.

*Table 3. OLS estimation results with **lfp** as dependent variable with including control variables*

variable	(1)	(2)	(3)	(4)
female	-.21***	-.22***	-.22***	-.21***
	(.0057)	(.0068)	(.0064)	(.0084)
married	-.08***	-.07***	-.07***	-.08***
	(.0065)	(.0066)	(.0066)	(.0092)
high_educ	.03***	.03***	.03**	.03***
	(.0072)	(.0072)	(.0099)	(.0072)
skilled	.67***	.66***	.66***	.67***
	(.0070)	(.007)	(.0073)	(.0070)
age	.67***	.02***	.01***	.019***
	(.0017)	(.0017)	(.0017)	(.0017)
age_squared	-.0002***	-.0002***	-.0002***	-.0002***
	(.0000)	(.0000)	(.0000)	(.0000)
work_exp	-.0004	-.0008*	-.0005	-.0004
	(.0003)	(.0003)	(.0003)	(.0004)
young	-.01	-.03*	-.02	-.01
	(.01)	(.01)	(.01)	(.01)
place birth				
Afghanistan	-.07***	-.07***	-.07***	-.07***
	(.0092)	(.0092)	(.0095)	(.0093)
Syria	-.06***	-.06***	-.05***	-.06***
	(.0069)	(.0069)	(.0071)	(.0070)
Iraq	-.09***	-.09***	-.08***	-.09***
	(.0087)	(.0087)	(.0090)	(.0088)
young*female		.04***		
		(.01)		
high_educ*female			.0051	
			(.01)	
married*female				.0032
				(.01)
_cons	-.02	-.03	.09**	-.03
	(.03)	(.03)	(.04)	(.03)
year fixed_effect	Yes	Yes	Yes	Yes
observations	22552	22552	21746	22363

Note: This table presents the results of the OLS estimation for the for the dummy lfp as the dependent variable. I included control variables into the economic models 1-5. In this analysis, the baseline for the birthplace dummy variable is refugees born in other countries around the world. The models incorporate year fixed effects and consider heteroskedasticity-robust standard errors. Significance levels are indicated as follows: *p < 0.05, **p < 0.01, ***p < 0.001.

5.2 Estimation result: logarithm of wage as dependent variable

Referring to table 4, the expected monthly average (raw) wage for a male refugee is 632.7 Euro, holding all other variables constant. Meanwhile, the wage for female refugee is expected to be approximately 63 percent lower, on average, as compared to male refugees. This estimate is significant at the 0.1% level.

Table 4: OLS estimation results with log of deflate current gross income as dependent variable

variable	(1)	(2)	(3)	(4)
female	-.63***	-.71***	-.63***	-.45***
	(.04)	(.05)	(.04)	(.05)
young		-.29***		
		(.03)		
young*female		.37***		
		(.08)		
high_educ			.19***	
			(0.3)	
high_educ*female			.04	
			(.10)	
married				.12***
				(.03)
married*female				-.29***
				(.08)
_cons	6.45***	6.52***	6.43***	6.39**
	(.05)	(.05)	(.05)	(.05)
year fixed effect	Yes	Yes	Yes	Yes
observations	4864	4864	4857	4832

Note: This table presents the results of the OLS estimation for the logarithm of deflated wages as the dependent variable. The models incorporate year fixed effects and consider heteroskedasticity-robust standard errors. Significance levels are indicated as follows: *p < 0.05, **p < 0.01, ***p < 0.001.

Referring to column 2, the gender wage gap for young is 44.81[1] percent smaller (in absolute value) than for old. This estimate is statistically significant at the 0.1% level, suggesting that age is a significant determinant of the gender wage gap. Moving to column 3, the insignificant coefficient estimate on the interaction variable suggests that education is not a significant determinant of the gender wage gap. On the other hand, the gender wage gap for

[1] $(\exp\{0.37\}-1)*100 = 44.81$

married is by 25.12 [2] percent higher (in absolute value) than for singles. This estimate is also significant at the 0.1% level, suggesting that marital status is a significant determinant of the gender wage gap. In sum, age and marital status determine the gender gap in wages among refugees.

I added control variables to the models 1-4. Table 5 presents the result of these estimation models. The wage for female refugee is expected to be approximately 63 percent lower, on average, as compared to male refugees. This estimate is significant at the 0.1% level. The gender gap in average (raw) wage is 40.55 [3] percent, controlling for other variables. This estimate is statistically significant at 0.1% level.

Referring to column 2, the gender gap for young is by 36.70 [4] percent smaller (in absolute value). This estimate is statistically significant at the 0.1% level, indicating that age continues to be a significant determinant of the gender wage gap, even conditional on the control variables included. Moving forward to column 3, the results suggest that education is still not a significant determinant of the gender wage gap. However, the gender wage for married is still larger (in absolute value) by 20.63 [5]percent, than for singles. This estimate is also significant at the 1% level, indicating that marital status is a significant determinant of the gender wage gap.

[2] (exp{-0.29}−1)∗100 = 25.12
[3] (exp{-0.52}−1)∗100 = -40.55
[4] (exp{0.31}−1)∗100 = 36.70
[5] (exp{-0.23}−1)∗100 = -20.63

Table 5: OLS estimation results with log of gross income as dependent variable and control variables

variable	(1)	(2)	(3)	(4)
female	-.52***	-.60***	-.51***	-.38***
	(.04)	(.05)	(.04)	(.06)
married	-.02	-.02	-.02	.01
	(.03)	(.03)	(.03)	(.030
high_educ	.15***	.15***	.15***	.15***
	(.03)	(.030	(.03)	(.03)
skilled	.51***	.51***	.51***	.52***
	(.04)	(.04)	(.04)	(.04)
age	.09***	.09***	.09***	.08***
	(.01)	(.01)	(.01)	(.01)
age_squared	-.0013***	-.0013***	-.0013***	-.0013***
	(.0001)	(.0001)	(.0001)	(.0001)
work_exp	.02***	.01***	.01***	.01***
	(.0026)	(.0026)	(.0026)	(.0026)
young	-.0001	-.03	.0022	-.0033
	(.05)	(.05)	(.05)	(.052)
birthplace				
Afghanistan	-.15**	-.15***	-.15***	-.14**
	(.04)	(.04)	(.04)	(.04)
Syria	-.22***	-.22***	-.22***	-.21***
	(.03)	(.03)	(.03)	(.03)
Iraq	-.18***	-.18***	-.18***	-.17***
	(.04)	(.04)	(.04)	(.04)
young*female		.31***		
		(.08)		
high_educ*female			-.04	
			(.09)	
married*female				-.23**
				(.08)
_cons	5.07***	4.96***	5.06***	5.06***
	(.28)	(.28)	(.28)	(.28)
year fixed_effect	Yes	Yes	Yes	Yes
observations	4864	4864	4857	4832

Note: This table presents the results of the OLS estimation for the for the dummy lfp as the dependent variable. I included control variables into the economic models 1-5. In this analysis, the baseline for the birthplace dummy variable is refugees born in other countries around the world. The models incorporate year fixed effects and consider heteroskedasticity-robust standard errors. Significance levels are indicated as follows: *p < 0.05, **p < 0.01, ***p < 0.001.

6 Conclusion

This paper investigates weather age, level of education, and marital status could explain observed employment gap among refugees in Germany. My findings indicate that age and marital status have significant role in gender gap. On average, young refugees experience smaller gaps in both LFP and wages, while married refugees face higher gender wage gaps compared to singles.

However, the level of education among refugees is not a significant determinant of the gender gap. I suggest this could be because individuals with higher education degrees have alternative pathways than seeking asylum. As a result, asylum seekers might have lower education on average, contributing to the absence of a significant impact of education on the gender gap. Additionally, refugees often face challenges in having their degrees and skills recognized leading many of them to experience a downgrading of their education and qualifications in the job market. These factors further support the findings.

One factor that may explain the significant role of marital status on gender gap could be the presence of serotypes and traditional gender roles within refugee communities, particularly for those with children. Insufficient and inadequate policies for work family balance (Buding et al., 2001) are factors that policy makers have the potential to address. By making childcare facilities accessible to refugees from the early stages of asylum- seeking process, the gender gap might be reduced, ensuring equal access to child development opportunities and promoting greater gender equality in the future.

Moreover, age significantly influences the gender gap among refugees, and this can be justified in several ways. Firstly, younger refugees show greater openness towards embracing the culture and social norms of their host countries; facilitating faster and more successful integration. Furthermore, refugee support organization and governments often implement

programs like vocational trainings and mentorship opportunities, which can contribute to improve employment outcomes among younger refugees. Hence, from the policy making perspective, it is crucial to ensure that refugees of all age groups have access and they attend the language and integration courses. Additionally, designing specialized programs to provide additional supports for old refugees, who may require more assistance, can be beneficial. Promoting interaction between female refugees and locals through targeted programs can also contribute to narrowing the gender gap.

My study has some limitations that should be acknowledged. Firstly, the very the data set used for my study covers short time period of five years. This limited time frame may not fully capture the determinants of gender gap among refugees, as some studies found variation in the gender gap in long run. Conducting future research with longer panel would provide a more comprehensive understanding of the determinants of gender gap in LFP and wages.

Additionally, while I keep all refugees from different origins, a significant portion of observations are from Afghanistan, Syria, and Iraq, as these countries have been the major origin of asylum seekers. So, this study might not have external validity for other refugee populations from different religious or culturally diverse background. It is important to consider the unique experiences, discrimination and socio-cultural factors specific to each group. Separate studies for different refugee populations would allow for more precise policy recommendations.

Furthermore, adding more control variables such as the number of children in household, availability of child care facilities, and level of German language proficiency may have an impact on the determinants of LFP and wages.

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