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Gender employment gap at arrival and its dynamics: The case of refugees in Germany

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ABSTRACT

In recent years, refugee women's experiences have received considerable attention in the academic discourse on immigrant labor market integration. Taking a dynamic perspective, we investigate gender differences in the labor market integration of refugees who arrived in Germany between 2013 and 2019. We examine refugees' trajectories in the early post-arrival period and explore a number of conditions that have been proposed to influence gendered labor market outcomes. Using panel data from the IAB-BAMF-SOEP Refugee Sample, we find initially narrow gender differences among refugees that gradually widen over time. While initial differences in human capital and care responsibilities contribute significantly to the gender gap in employment in the first year after arrival, our study shows that the gap widens primarily due to refugee women experiencing lower returns to their human and social capital and health, as well as bearing a heavier burden of childcare responsibilities. These findings highlight the compounded disadvantages that refugee women face in the host country due to their limited ability to fully utilize their labor market resources, coupled with their primary responsibility for childcare. Moreover, our findings suggest that existing theoretical explanations in the literature are insufficient to fully explain the barriers refugee women face when entering the labor market.

1. Introduction

With the ongoing political crisis in Syria, Afghanistan, and other conflict areas, many OECD countries have hosted men, women, and children searching for shelter since 2013 (Hatton, 2020). The large influx of refugees[4] posed several challenges for the receiving countries, particularly the labor market integration of those planning to remain permanently. Several studies have highlighted the so-called *refugee gap*, referring to the labor market disadvantages experienced by refugees compared to non-refugee immigrants (e.g., Bakker et al., 2017; Brell et al., 2020; Connor, 2010; Kosyakova & Kogan, 2022). Furthermore, migration literature has demonstrated that the labor market integration of female immigrants (Donato et al., 2014; Schieckoff & Sprengholz, 2021) and female refugees (Cheung & Phillimore, 2017) lags behind their male counterparts, creating a double disadvantage, i.e., the disadvantage of being attributed to immigrant status, and gender (Donato et al., 2014; Rebhun, 2008). Recently, this concept has been extended to highlight a *triple disadvantage* faced by female refugees (Liebig & Tronstad, 2018). In other words, when competing for jobs, female refugees face disadvantages attributed to gender, immigrant

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[4] Henceforth, the term 'refugees' is used colloquially and concerns all persons who move to another country on humanitarian grounds, irrespective of their legal status (e.g., refugee, asylum-seeker). Note that when we use the term 'immigrants', we refer to all immigrants, including refugee and non-refugee immigrants. It is worth mentioning that the distinction between refugees and (non-refugee) immigrants is not always definitive due to the diverse reasons for migration (cf. Abdelaaty & Hamlin, 2022). Nevertheless, in our study, we utilize the dichotomy of refugees and (non-refugee) immigrants based on their legal status in Germany, which is a clear and relevant criterion for labor market integration. Additionally, the data collection process considers official legal status of the respondents. This binary classification may not capture the intricacies of the situation, it is necessary for practical purposes in this study.

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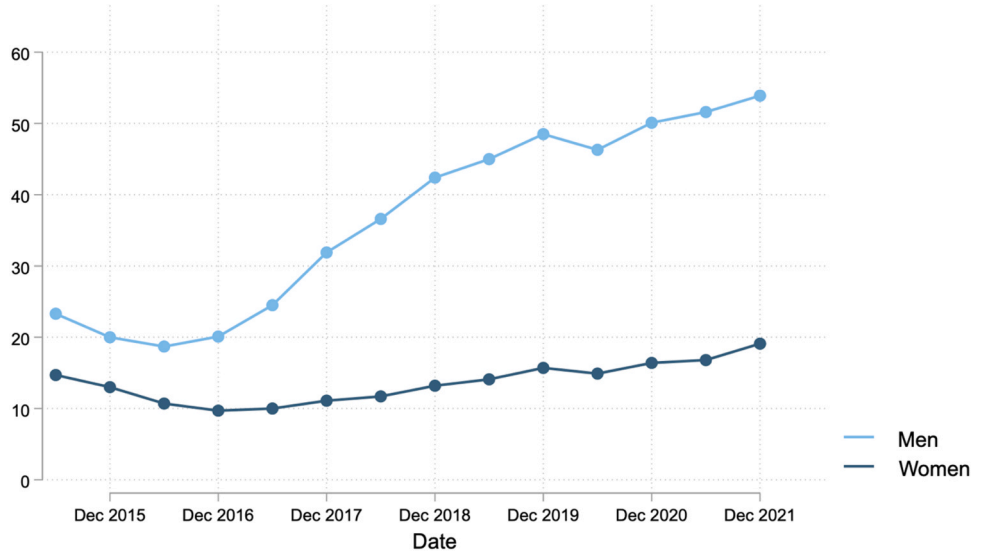

Fig. 1. Employment rate of refugees in Germany by gender (in percent) between 2015 and 2021, *Note*: Proportion of employees (subject to social security contributions and only marginally employed; at place of residence) aged 15–64 in relation to the population of the same age. Countries of origins: Afghanistan, Eritrea, Iraq, Iran, Nigeria, Pakistan, Somalia and Syria. *Data source*: Statistics from the Federal Employment Agency, the Central Register of Foreigners and the Federal Statistical Office.

status, and forced migration simultaneously. This situation results in lower employment levels among refugee women, not only in comparison to non-refugee immigrants and native-born women but also in comparison to refugee men.

However, little is known about whether and to what extent refugee women face specific challenges in their labor market integration compared to refugee men. To date, most previous studies on labor market integration in Western countries have focused exclusively on the labor market situation of immigrant men (Fleischmann & Höhne, 2013). Nevertheless, recent studies suggest that immigrant women, especially refugee women, face greater hurdles in labor market integration (e.g., Cheung & Phillimore, 2017). For example, Brell et al. (2020, sec. Appendix Table A1) find that the female-to-male employment ratio in the United States is 92 % for natives but only 62 % for refugees. They report similar patterns for other Western countries, with Germany showing the largest labor market disadvantage for female refugees two years after arrival (Brell et al., 2020, Appendix Table A1). Despite these observations, the underlying causes of the gender employment gap among refugees remain insufficiently understood.

Moreover, the dynamics of the gender employment gap among refugees in the years following their arrival remain poorly understood in current research. Previous studies by Raijman and Semyonov (1997) and, more recently, Rebhun (2008), Bakker et al. (2017), and Lee et al. (2022) revealed that the economic gap between (refugee and non-refugee) immigrants and natives lessens over the duration of immigrants' stay. At the same time, the reduction in female refugees' labor market disadvantages over time is relatively minor (Brell et al., 2020, Appendix Table A1; Kosyakova et al., 2022), underscoring the need to adopt a dynamic approach to studying labor market integration from a life course perspective. Given the specific disadvantages that refugee women and men face, such as few opportunities for preparation before migration, higher institutional barriers to work permits, or greater care responsibilities, it is crucial to investigate how the gender employment gap evolves differently for refugee women and men. By examining the labor market integration process dynamically rather than statically, we can gain a deeper understanding of the economic gender disparities experienced by refugees.

In this paper, we seek to fill this gap by investigating how the gender employment gap for refugees evolves in the years subsequent to their arrival and by elucidating the mechanisms underlying the gender gap. More specifically, we aim to address two fundamental research questions: First, we ask how the employment rate of refugee women changes relative to that of refugee men during the first six years following their arrival. As we will show, the already lower employment rate of refugee women after arrival increases at a notably slower pace than that of their male counterparts, culminating in a widening employment gap between the two groups. Second, we examine the factors contributing to the widening gender employment gap and ask whether these disparities can be attributed to differences in resources before migration, disparities in constraints and investments in relevant capital after arrival, or different returns on their resources.

Our analysis focuses on recent refugees in Germany. Germany has been one of the top destinations for refugees in the last decade, with 2.3 million first-time asylum applications between 2014 and 2022 (BAMF, 2023). At its peak, between 2015 and 2016, Germany received around 1.2 million first-time asylum applications (equivalent to 46 % of those submitted to the EU, Eurostat, 2020). The number of female refugees of working age in Germany has risen continuously and reached 455,000 by the end of 2021, making up one-third of the refugee population of working age (own calculation based on DESTATIS, 2023).

We posit that refugee women encounter more challenges in securing employment upon their arrival than their male counterparts and that this gender employment gap exacerbates over the course of their stay. Specifically, we contend that the lower level of and lower returns to both human and social capital, traditional gender role values, more prevalent care responsibilities, on average, (due to the fact that refugee women often reside in Germany with partners and children, whereas refugee men frequently live alone Brücker et al., 2020), and higher susceptibility to health issues diminish the probability of refugee women taking up employment compared to refugee men. Furthermore, we anticipate that refugee men, due to fewer care responsibilities, better health, and greater expected returns, will likely invest more in human and social capital relevant to the labor market, ultimately resulting in a wider gender gap in employment over time.

To validate our claims, we employ a unique and high-quality panel data source, the *IAB-BAMF-SOEP Sample of Refugees in Germany* (Brücker et al., 2017). The data enable us to track the employment trajectories of refugees from the initial stages of their arrival in Germany up to seven years following their arrival. We scrutinize the causes behind the shifting gender employment gap among refugees by capitalizing on the panel

structure of our data and applying panel data decomposition techniques (Kröger & Hartmann, 2021). This approach allows us to discern the degree to which compositional differences contribute to the gender employment gap among refugees, as well as how changing compositional disparities and mechanisms contribute to the evolving employment inequalities experienced by refugee women in the labor market.

2. Social context: recent refugees in the German labor market (2010–2020)

With up to 2.1 million immigrants per year over the last decade (DESTATIS, 2019), Germany has been one of the top destinations for immigrants among OECD countries (OECD, 2021). Although refugees are a significant portion of Germany's migrant inflow, they are not the majority. Between 2010 and 2020, 27 % of the 5.5 million non-EU immigrants who arrived in Germany were refugees (Adunts et al., 2022). Before the war in Ukraine in February 2022, the peak of refugee inflows occurred between 2015 and 2016, driven mainly by refugees from Syria, Iraq, and Afghanistan (Brücker et al., 2020). The majority of these refugees were young and male, with approximately two-thirds aged between 18 and 35, and one-third were women (*ibid.*).

With a growing influx of refugees in 2015–2016, German policymakers and society faced challenges of creating opportunities for refugees to integrate into the labor market and society promptly. To this end, several measures were introduced, including acceleration of asylum procedures, facilitating access to language courses, and reducing employment barriers, such as the priority check to ensure that no German or EU citizen can fill a specific job position (Kosyakova & Brenzel, 2020). However, refugees with unclarified asylum status or those with a negative asylum decision but whose stay in Germany is tolerated still face some obstacles in accessing employment. For instance, those waiting for a decision face a three-month blocking period following their arrival in Germany (§ 61 AsylG). In case of the residence in reception facilities, this period is extended to 9 months. Both groups also must fulfill specific conditions to access employment, such as approval from the relevant immigration office and a comparability test regarding the conditions of work and remuneration (*Vergleichbarkeitsprüfung*) conducted by the Federal Employment Agency (BA). Refugees from the so-called secure countries (Ghana, Senegal, and West Balkan) faced a general employment ban if they applied for asylum after August 31, 2015.

Fig. 1 depicts the employment rates of refugees in Germany by gender over a five-year period from 2015 to 2019, using the official statistics of the German Federal Employment Agency (BA).[5] While the official statistics do not provide direct information on the employment of refugees due to the lack of data on legal status, the employment rates of refugees can be inferred based on the eight key countries of refugees' origin (namely, Afghanistan, Eritrea, Iraq, Iran, Nigeria, Pakistan, Somalia, and Syria).

The findings in Fig. 1 illustrate that female refugees face lower employment rates compared to their male counterparts. Nonetheless, the gender gap in employment rates among refugees varied substantially over time and increased from around nine percentage points in 2014 to over 30 % points in 2021.

As other studies show, a significant gender gap in refugee employment is not unique to the German context (e.g., Bakker et al., 2017; Brell et al., 2020; Kanas & Steinmetz, 2021). Particularly in the early post-arrival period, refugee women are less likely to be employed than male refugees with the same length of stay (Bakker et al., 2017; Brell et al., 2020). For instance, following Brell et al. (2020), two years after arrival, the employment rate of refugee women in Germany only reached 11 % of the employment rate of refugee men. This stands in sharp contrast to the female–to–male employment ratio among other immigrants (40 %) or the native-born majority (88 %) (Brell et al., 2020, sec. Appendix Table A1; see also Lee et al., 2022). Similar results have been reported for other countries such as Australia, Finland, and the UK, albeit with less pronounced gender employment gaps. Over time, across various refugee arrival cohorts and across various receiving countries, the female refugees' labor market disadvantage decreases but never fully vanishes (e.g., Bakker et al., 2017; Brell et al., 2020; Kanas & Steinmetz, 2021).

3. Explanations for the gender employment gap among refugees

Theoretical accounts of migrant integration emphasize its multifaceted nature, pointing to the importance of migrants' resources as well as the integrative efforts of both migrants and members of the host society (cf. segmented assimilation theory, Portes & Zhou, 1993). Thus, immigrants' pre-migration resources such as education, language skills, the transferability of these resources to the host country, as well as post-arrival investments in relevant resources, legal barriers to employment, or discrimination figure prominently as explanations of immigrants' integration outcomes in the literature (Kalter, 2008; Kosyakova & Kogan, 2022; Luthra et al., 2018). In what follows, we build on these general ideas and discuss how differences in refugee women's and men's resources and institutional arrangements help to explain the gender employment gap and its evolution among refugees.

To explain how the gender employment gap evolves over time, we distinguish between arguments that seek to explain the different employment chances of refugee women and men early after their arrival and arguments that seek to explain how their employment chances evolve over the course of their stay in Germany. While the former arguments rely mainly on gender differences in pre-migration resources, the latter arguments seek to explain changes in the gender employment gap over time, mainly by unequal changes in refugee women's and men's resources and their effects on employment over time.

3.1. Human capital and transferability issues

The standard explanation for gender differences in labor market outcomes among refugees is derived from human capital theory (Becker, 1985), according to which women anticipate future family obligations and invest less in their human capital than men, resulting in lower work experiences and opportunities. Structural differences in educational attainment by gender in the country of origin are likely to be reflected in the qualifications of male and female immigrants (Fleischmann et al., 2014). Indeed, in the main countries of origin of German refugees, such as Syria, Afghanistan, or Iraq, women's education and employment rates are significantly lower than those of men (WEF, 2021) and, at least with regard to education, this is also the case at the time of their arrival in Germany (Brücker et al., 2020). Given their lower human capital and following the household specialization perspective (Becker, 1985), we expect particularly mothers and women in partnership to specialize in domestic work after arrival while men focus on labor market activities.

Besides human capital levels, the type of human capital refugees bring with them can vary by gender as well. Owing to socialization processes shaping traditional gender roles over the life course and prevailing gender expectations in society, women tend to choose jobs that are close to their tasks in the family, such as service work, education, caring jobs, and nursing (Blossfeld, 1987). In contrast to male-dominated jobs in agriculture or industry, these knowledge-intensive service jobs (such as teaching or education) require country-specific knowledge and skills, which may further disadvantage refugee women when seeking employment.

Apart from the quantity and nature of human capital that refugees bring with them prior to their arrival in the host country, the post-arrival investment in labor market-relevant human capital is pivotal for their employment prospects. Given the challenging circumstances prevailing

[5] Note that the official statistics consider the nationality of persons meaning that those who acquired German citizenship will be underestimated.

in their home countries, refugees often perceive returning to their origins as an unfeasible choice and display pronounced settlement intentions (Cortes, 2004; Kosyakova & Kogan, 2022). This extended time horizon, within which refugees can reap the benefits of their investments in human capital, is expected to heighten their motivation to engage in formal education and training in the destination countries (Cortes, 2004; Damelang & Kosyakova, 2021). However, refugee women encounter additional challenges in this domain when compared to men. Since their skills are more commonly aligned with knowledge-intensive services, refugee women necessitate greater investments to acquire the appropriate target-specific knowledge. Consequently, we anticipate refugee women to invest less in job-specific skills than men.

Investing in language skills can be a further means to transfer human capital acquired abroad to the labor market of the receiving country and increase employment chances (e.g., Zwysen, 2019). Language skills can signal a willingness to adapt to the new country, enabling communication with potential employers and colleagues and in the job searching and application process as well. At the same time, the improvement of the labor market opportunities for immigrants through language training and certification in the receiving country can be perceived differently by men and women. In immigrant families, men are often given preference when making investment decisions: compared to women, men attend language or integration courses more often and earlier (Bernhard & Bernhard, 2021).[6] In addition, the differently composed social networks of women – their greater social interaction with co-ethnics and men's greater social interactions with natives (Hartmann & Steinmann, 2021; Kosyakova & Kulic, 2022; see also Section 3.3) – could also play a role in learning the language. Correspondingly, immigrant men are more likely to acquire skills and knowledge that are specific to the receiving country, which makes it easier for them to take up employment.

At the same time, previous research contends favorable self-selection in the labor market-relevant skills and other abilities among immigrants (Borjas, 1987; Chiswick, 1999) and, to a lesser extent, among refugees (Spörlein & Kristen, 2019). More importantly, female refugees display stronger skills-selectivity profiles than males (Spörlein & Kristen, 2019). These patterns are explained via gender-specific discrimination risks, which are more pronounced in African and Asian sending countries compared to receiving countries in Europe (Aksoy & Poutvaara, 2021). The stronger positive skills selection of female refugees may function as an important resource to cushion their deficiencies in host-country-specific capital (Kreisberg & Jackson, 2022).

3.2. Care responsibilities, family roles, and values

Similar to native women, care responsibilities and traditional family roles may constrain refugee women's labor market attachment (Fendel & Kosyakova, 2023; Salikutluk & Menke, 2021). For refugees, however, care responsibilities can be expected to have particularly detrimental consequences because they have fewer opportunities to rely on extended family members, are less socially embedded in the early stages of their stay, and thus have fewer opportunities to outsource care responsibilities (Kosyakova & Kulic, 2022). As a result, caring for children or elderly parents may limit or exclude their availability for the labor market. As most refugees in Germany come from countries with traditional gender roles, we expect care responsibilities to hinder refugee women's employment in the years after arrival. Care responsibilities can also shape the incentives and time refugee women are able or willing to invest in host-country-specific capital (Bernhard & Bernhard, 2021). This is particularly evident in the case of those with young children, who face increased pressure to stay at home for longer periods of time and, therefore, have fewer incentives to invest in host-country-specific capital, such as language skills, compared to their male counterparts.

Regarding gender role values, previous studies have argued that traditional concepts of gender roles could negatively impact women's propensity to engage actively in the labor market regardless of actual care responsibilities (e.g., Corrigall & Konrad, 2007). However, the empirical evidence speaks against this explanatory model (Salikutluk & Menke, 2021). Beyond individuals' gender role values, institutionalized expectations of traditional family models may further contribute to females' lower investment in host-country-specific capital. In Germany, for example, women with children under three years old are automatically exempt from the category of "persons capable of working" and are not subject to labor market activation policies (Eichhorst et al., 2010, p. 81), which can perpetuate traditional gender role values and widen the gender employment gap over time. Additionally, religion is argued to shape female immigrants' labor market integration operation, particularly through family behavior and gendered family roles beliefs (Ghazal Read, 2004) but also to have its own effect independent of individual cultural beliefs (Khoudja & Fleischmann, 2015; van Tubergen, 2007) and specific religious affiliations (Ghazal Read, 2004).

The influence of migration reasons on the labor market integration of newcomers has been a subject of discussion (Kanas & Steinmetz, 2021). Refugees, typically forced to flee their country of origin due to armed conflict or persecution (Hatton, 2020), often find immediate safety in neighboring countries. However, the decision of refugees to undertake a challenging and dangerous journey to Germany implies the presence of additional motives, including economic incentives (Brücker et al., 2016). Building upon the longstanding assumption that individuals who migrate for work-related reasons exhibit a higher motivation to succeed in the destination country's economic sphere (Chiswick, 1999), we anticipate refugees with economic migration motives to experience greater labor market integration compared to those prioritizing family-related matters. Consequently, if female refugees are more likely than their male counterparts to prioritize family-related motives over economic motives, this disparity may manifest in long-term lower labor market integration among women.

3.3. Social networks and embeddedness

While a certain level of language skills is necessary in order to communicate with non-immigrants (e.g., Martinovic et al., 2011), having contact with natives can be itself an opportunity for immigrants to improve their language skills (e.g., Kosyakova, Kristen et al., 2022). Non-immigrant friends and acquaintances, also defined as bridging ties, can also provide information on open labor market positions and informal knowledge about the fundamental structure of the labor market (Lancee, 2012). Although the concrete mechanisms have not been investigated yet, the literature consistently proves the positive effects of having non-immigrant members in the social network compared to members from the same origin (e.g., DiMaggio & Garip, 2012; Lancee, 2012). For refugees, social networks are regarded as particularly essential due to their lack of destination language skills and less informed migration decisions (van Tubergen, 2011).

Previous research stressed that the network composition of immigrant men and women has different features. For instance, while immigrant men's networks are stronger linked to work and include more persons beyond kinship boundaries, immigrant women's social networks consist predominantly of family and relatives (Schrover et al., 2007). For refugee women, research has shown that they mainly stay in

[6] Refugees' access to language courses depends on the type of course. Access to courses that are not publicly funded – which may include those provided by volunteers, similar organizations, or universities – is not regulated. Publicly funded courses, such as integration courses (which consist of 600 h of language training and 100 h of basic knowledge about German legal systems, history, and culture), are accessible to refugees with an approved status or, under certain conditions, to those waiting for asylum application decisions. For the former group, participation in such a course is mandatory (Kanas & Kosyakova, 2023; Kosyakova & Brenzel, 2020). However, participants have some flexibility in determining the timing of course commencement.

a family context and spend less time than men with non-immigrants or people living in Germany for a longer period (Hartmann & Steinmann, 2021; Kosyakova & Kulic, 2022). Accordingly, refugee women are less likely than men to build a broad social network that can support them, for example, in finding work.

3.4. Health and traumatic experiences

As a result of wars, violence, and persecution in countries of origin and transit countries, refugees are often exposed to traumatic events. That these experiences can harm refugees' mental and physical health (e.g., Ambrosetti et al., 2021) and that such pre- and post-migration mental health problems affect their integration chances has been empirically confirmed (e.g., Walther et al., 2020). Refugee women display a stronger prevalence of such health-related risks than men, which is often attributed to women's increased risk of being exposed to gender-specific and sexual violence before or during their flight (Axinn et al., 2013). Also, women are additionally burdened by pronounced stress factors, for example, due to less social participation after arrival (Beiser & Hou, 2017). Since health is an important factor for skills acquisition, social inclusion, and individual labor market opportunities, women's worse health can contribute not only to initial gender differences in employment but also to lower investment in host-country specific skills and contacts, shaping thereby the gender employment gap to the disadvantage of female refugees.

3.5. The context of reception

Special features of refugee migration, such as the duration and the processing of the asylum procedure, the organization of the asylum accommodation, the granting of extended residence status, and the provision of integration courses are essential elements for their sustainable integration (Kogan & Kalter, 2020; Kosyakova & Kogan, 2022).

In most receiving countries, refugees' access to the labor market is restricted during asylum procedures and in cases of rejected applications (e.g., Hainmueller et al., 2016; Kosyakova & Brenzel, 2020). This legal status situation can also indirectly affect refugees' labor market integration, for example, by impairing refugees' investment into country-specific human capital, including education, training (Damelang & Kosyakova, 2021), and language skills (Kosyakova, Kristen et al., 2022). Consequently, if female refugees face fewer chances for approved applications, this may seriously impair their integration chances. Previous research provides no equivocal answer on gendered patterns in chances for approved applications, with some studies pointing to fewer chances for approved applications by refugee women (Bloch et al., 2000; Keith & Holmes, 2009) or refugee men (Gundacker et al., 2021; Plümper & Neumayer, 2020). Thus, the impact of gender-specific differences in legal status remains largely exploratory. In any case, recent studies contended that initial differences in legal status are reflected in labor market outcomes and largely persist over time (Kreisberg, 2019; Kreisberg & Jackson, 2022).

Finally, refugees' difficulties in the labor markets might also be related to the hostility and prejudice of the majority population (Esses et al., 2017). Discrimination refugees might experience in access to employment, housing, and everyday interaction might slow down their economic progress in the receiving country (Montgomery & Foldspang, 2008). The survey-based research and in-depth interviews capture self-reports of refugees' experiences with racism and labor market discrimination, with refugee women reporting additional challenges related to stereotyping and discrimination by potential employers and governmental agencies (Senthanar et al., 2021). However, experimental research using correspondence tests is not clear-cut. For instance, Arai, Bursell, and Nekby (2016) uncover discrimination against job applicants with Arabic-sounding names in the Swedish context, with men being particularly affected. Dahl and Krog (2018) also report lower call-back rates for male applicants in correspondence studies in Denmark when applicants have a Middle-Eastern-sounding name. In turn, Di Stasio and Larsen (2020) report pronounced ethnic and racial discrimination against minority women in female-dominated occupations. A few studies focusing on women demonstrate that female Muslim immigrants face discrimination in the labor market in Western countries, particularly when they wear a headscarf (e.g., Fernández-Reino et al., 2022; Weichselbaumer, 2020).

3.6. Hypotheses

In sum, our arguments suggest that female refugees are likely to encounter more challenges in securing employment after arrival than their male counterparts. This is primarily because they have less transferable human capital acquired before migration and lower host-country specific human capital and language skills, coupled with greater care responsibilities and limited social networks in the host society. Further compounding this disadvantage are traditional gender norms that may discourage women from seeking employment, as well as their increased vulnerability to physical and mental health issues. Our expectations conform to the 'starting point hypotheses' (Kreisberg, 2019), following which (lack of) premigration resources create initial stratification in access to postmigration resources. While resource access may improve over time, the initial starting disparities are likely to persist (Kreisberg, 2019; Kreisberg & Jackson, 2022).

Moreover, we may also expect that the gender employment gap among refugees will widen over the course of their stay in Germany. Here, our arguments align with the cumulative (dis)advantage thesis (DiPrete & Eirich, 2006; see also Merton, 1968), which posits that the process of socioeconomic attainment is shaped either by prior experiences and inequalities that are reproduced and amplified over the one's career or by different returns to socioeconomic resources. This idea is also consistent with the resource multiplication perspective (Ross & Mirowsky, 2006), following which relevant resources may multiply each other's impact, while individuals with only one resource face lower benefits. In the case of the gender employment gap among refugees, our arguments suggest that refugee women invest less in human and social capital necessary for the labor market, due to their higher costs of acquiring the appropriate target-specific knowledge, greater time constraints due to care responsibilities, poorer health, lower and more uncertain returns on their investments, and the prioritization of men in investment decisions. Since human capital requires investments to maintain its value, we expect women's returns to their initial human capital to increasingly lag behind those of men. Consequently, we expect the gender employment gap to increase over time.

Although these expectations are based on established theories and previous research, the gender-specific effects of the asylum process, regional labor market conditions, and even educational credentials on refugee employment remain unclear. For example, it is uncertain whether there are gender differences in the rate and duration of asylum or whether discrimination disproportionately affects the employment prospects of refugee women. Therefore, our examination of these factors will be exploratory in nature.

4. Data and method

4.1. Data and sample

The empirical analyses are based on the longitudinal data, the *IAB-BAMF-SOEP Sample of Refugees in Germany* (Brücker et al., 2017), which is a joint project of the Institute for Employment Research (IAB), the Research Centre on Migration, Integration, and Asylum of the Federal Office of Migration and Refugees (BAMF-FZ) and the German Socio-economic Panel (SOEP). The data was launched in 2016, in the aftermath of the surge of refugee migration to Europe in 2015, and has been collected annually and included several refreshment samples to compensate for panel attrition and to cover more recent arrivals in

Germany.

The anchorpersons in the survey were drawn from the Central Register of Foreigners, the national registry of all foreign citizens in Germany. The data are representative of asylum-seekers and refugees arriving in Germany between 2013 and 2019 (Kroh et al., 2017; Steinhauer et al., 2020). The survey is based on a concept of households according to which every adult household member is interviewed. The data collection was based on computer-assisted personal interviews (CAPIs) and was supported by interpreters if needed. Questionnaires were provided in seven languages (i.e., Arabic, English, Farsi/Dari, German, Kurmanji, Pashto, and Urdu), and included auditory instruments for survey participants who were illiterate. Employment of various modes and tools allowed to minimize a response bias associated with language barriers (Jacobsen, 2018, p. 83). The original dataset includes 10,111 individuals who were surveyed at least once.

For our empirical investigation, we restricted the data as follows (for details, see Supplemental file Table A2). To capture the early period of integration and for the sake of comparison, we restrict data to refugees with a duration of stay no longer than eight years at the time of the first interview. Given our focus on employment integration, we consider only those of working age at arrival to Germany (between 18 and 55) and those with non-missing information on employment status. Eventually, our analyses cover 3449 women and 5065 men. Of these, almost 49 % are of Syrian origin, 12 % of Afghan origin and 14 % of Iraqi origin. Supplemental file Table A3 displays how observations are distributed across the years of stay in Germany.

4.2. Measures

Our main outcome of interest is *gainful employment* measured based on self-reported employment status. Following the definition of the International Labor Organization (ILO), employment is defined as work performed in return for pay or profit. Accordingly, we count respondents who were full- or part-time employed, in vocational education or internships or apprenticeships, and those marginally employed at the time of the interview as being employed as long as they indicate gross monthly earnings above zero.

To address gender differences in employment among refugees, we rely on a range of indicators, which reflect the discussion in the theory section. We group these indicators according to the defined constructs: human capital, German language skills, care responsibilities, values and motivations, social contacts, health status, legal status, discrimination, and regional and data controls. Supplemental file Table A4 presents the definitions of all variables and indicates whether the measures differ between the two data sources; Table A5 provides information about the distributions of all variables in the two datasets.

Regarding human capital, we include several measures: (1) the level of education acquired in the country of origin (henceforth, CO), i.e., *education in CO* (grouped into less than primary, primary, lower secondary, upper secondary/postsecondary nontertiary, and tertiary); (2) the *recognition of credentials*acquired in CO (grouped into no application, fully/partly recognized, not recognized, and in process); (3) obtainment of an *education degree in Germany*.; and (4) the respondent's *cognitive skills* measure by the Symbol-Digit Test, a speed-constrained measure of information-processing capacities that ranges from 0 to 100 (Lang et al., 2007). Further, we (5) include a measure of the respondent's *literacy in the country-of-origin language*, which we dummy code from a mean index of the respondents' reading and writing skills. Human capital constructs further include variables for labor market experience in CO. Here, we consider refugees' *economy sectors* (grouped into never worked, primary, secondary, tertiary, education, healthcare and social work, and other quaternary) and their *work experience* in years.

German language skills are addressed via additive indices on *premigration* and *postmigration language proficiency,* both comprising information on respondents' self-rated competencies in speaking, reading, and writing in German before arrival in Germany and at the interview on a scale from 0 ("very good") to 4 ("not at all"). We reversed these scales before calculating the index so that a greater value indicates a higher level of proficiency. We further consider whether respondents had attended a *language course* after migration.

To approximate care responsibilities, we account for having a *partner in the household* and *children aged below 17* (grouped into no children, children aged between 0 and 2, children aged between 3 and 6, and children aged between 6 and 16).

Values are addressed via continuous measures for the country-of-origin-specific ratio of female to male labor activity (*female/male labor activity in CO)* in the year before arrival in Germany (e.g., Frank & Hou, 2015; Fuwa, 2004). For this purpose, we enriched our survey data with the country-of-origin-specific female-to-male labor force participation ratio data from The World Bank (2021). In addition, we include two standardized variables for self-reported *traditional gender roles regarding employment* and *traditional gender roles regarding power* (Hartmann & Steinmann, 2021). Further, we include a dummy variable on the *importance of religion* which indicates whether respondents find religions at least important for personal well-being.

To address motivation, we include respondents' migration motives, where we distinguish between *economic orientation* and *family-/network orientation* (dummy-coded). For settlement intentions, we include two items on respondents' feeling of *connection to Germany* and their *country of origin* ranging from 1 ("Very much") to 5 ("Not at all").

We measure social contacts via three dummy indicators for whether respondents are in *contact with Germans*, in *contact with co-ethnics*, or in *contact with other immigrants*. In addition, we include a further dummy variable on whether respondents had *pre-migration contacts in Germany*.

To measure health status, we consider the *number of traumatic events* (during escape)[7] refugees have reported as well as the respondents' *pre-migration health satisfaction,* which ranges from 0 ("Not at all") to 10 ("Very much"). In addition, we include two indicators for the respondent's *mental* and *physical health.* The former is based on the short form version 2 questionnaire (SF-12v2; Ware et al., 2002) and includes the role of mental and emotional health, social functioning, and vitality (Andersen et al., 2007). The latter is based on the same questionnaire and includes physical aspects of health-related quality of life, in particular physical functioning, the role of physical and bodily pain in overall health. Both indices range from 0 to 100, with higher scores indicating better health.

To address the residency status of refugees, we consider *residence title* (grouped into residence permission, no residence permission, temporary residence permission, and others) and the *length of the asylum procedure* (in months).

Discrimination is measured via a dummy variable that indicates whether *respondents often or frequently felt discriminated against because of their origin.*

As controls, we include the respondent's *age at immigration*, whether respondents live in *shared accommodation,* and the *survey sample*. At last, we include the *regional unemployment rate*, *the share of foreigners*, *the log of population density,* and the *share of children in childcare*, all captured in

[7] The interviewers were instructed to approach trauma-related questions with sensitivity, avoiding any pressure on respondents uncomfortable with addressing these issues. Moreover, the IAB-BAMF-SOEP Survey of Refugees included a filter question effectively allowed respondents to bypass the entire section related to flight experiences, which also included questions about trauma. The number of respondents who refused to answer this section (and, correspondingly, the trauma questions) was high (around 30 %), particularly for refugee women. It is likely, therefore, that the data underestimates the number and severeness of female refugees' traumatic experiences. It is worth noting that there were gender-specific differences in the types of traumatic incidents reported by refugee men and women (with men being more likely to be robbed while women being more likely to experience sexualized violence, Brenzel et al., 2019). Consequently, the short- and long-term implications for mental and physical health are likely to diverge based on gender.

the survey year at the county level and obtained from INKAR (BBSR, 2021).

4.3. Analysis strategy

To address our first research questions about the evolution of the gender employment gap among refugees and its underlying mechanisms, we begin by providing descriptive findings on refugee women's and men's characteristics upon arrival (for time-constant variables) and in the year following their arrival as well as after three and six years (for time-varying variables). Furthermore, we present descriptive results regarding the progression of the gender employment gap during the initial eight years post-arrival. As we present the characteristics of refugee women and men by years after arrival rather than by historical year, we cannot use cross-sectional weights and, therefore, do not use weights in the analyses.[8]

In examining the causes of the gender gap, we employ a two-step approach. First, we conduct a three-fold Oaxaca-Blinder decomposition (Blinder, 1973; Oaxaca, 1973) to analyze the gender employment gap in the first, third, and sixth year following arrival. The Oaxaca-Blinder decomposition is a widely used method in sociological studies, particularly in investigating labor-market-related gender (e.g., Combet & Oesch, 2019) or racial inequalities (e.g., Mandel & Semyonov, 2016). This decomposition involves utilizing separate regression models for each group, namely men and women. It deconstructs the differences in the employment probabilities between them into three individual components. First, the endowments component indicates the extent to which compositional differences in characteristics (the X's) account for the gender employment gap. It assumes that women's and men's characteristics or endowments lead to the same labor market returns. For example, good German skills increase the employment probability of men and women to the same extent. Second, the coefficient component elucidates the portion of the gender employment gap explained by group-specific coefficients. For example, it shows how the employment probability of women with good German skills differs from that of men with good German skills when the two do not differ in other characteristics. Third, the interaction component considers simultaneous variations in both endowments and coefficients. It captures the combined influence of differences in characteristics and coefficients on the gender employment gap.

One advantage of our data is that it contains individual observations over multiple years, allowing us to examine the evolution of the gender employment gap using the same sample population. To accommodate the panel structure of the data, we estimate all coefficients using random effects panel regression models. However, these models assume time-constant individual error terms that may differ between women and men. Given that these group differences contribute to the gender gap, we employ a modified version of the Oaxaca-Blinder decomposition that considers these additional group differences (Kröger & Hartmann, 2021).

Thus, our decomposition of the initial gender employment gap relies on the following model:

$$\overline{Y}_m \quad \overline{Y}_w = [E(X_m \quad X_w)^*\beta_w] + [E(X_w)^*(\beta_m \quad \beta_w)] + [E(X_m \quad X_w)^*(\beta_m \quad \beta_w)] + [E(u_m) \quad E(u_w)], \tag{1}$$

where $\overline{Y}_m$ and $\overline{Y}_w$ are employment status of men and women, respectively. $\overline{X}_m$ and $\overline{X}_w$ are means of all predictors, β_m and β_w are the coefficients of these predictors for men and women, respectively, and u_m and u_w are men's and women's time-constant individual error terms.

[8] Even so, the data do not contain any self-selecting bias based on gender, and we therefore expect our descriptive results regarding the gender employment gap to be unbiased (Kroh et al., 2017).

Table 1
Descriptive sample characteristics by gender, time-constant variables.

	Men		Women		
Human capital					
Education in CO					
Less than primary	20 %		27 %		***
Primary	19 %		18 %		
Lower secondary	22 %		21 %		
Upper secondary/ Postsecondary nontertiary	26 %		23 %		**
Tertiary	12 %		12 %		
Digit-Symbol Test[1])	95.2	(11.1)	94.9	(11.3)	
Literacy in CO	83 %		79 %		***
With work experience in CO	84 %		35 %		***
Work experience in CO, in years[2])	11.7	(8.6)	8.7	(7.6)	***
Sector of economy in CO[2])					
Primary	9 %		4 %		***
Secondary	30 %		9 %		***
Tertiary	44 %		34 %		***
Education	4 %		31 %		***
Healthcare and social work	4 %		11 %		***
Other quaternary	10 %		10 %		
German language skills					
Premigration language proficiency	0.3	(1.4)	0.3	(1.2)	**
Values					
Female/male labor activity in CO	31.1	(20.8)	31.3	(21.3)	
Traditional gender-role, employment (standardized)	0.1	(1.0)	-0.1	(1.0)	***
Traditional gender-role, power (standardized)	0.0	(1.0)	-0.1	(0.9)	***
Motivation					
Economic motives at arrival	45 %		46 %		
Family-/network motives at arrival	15 %		22 %		***
Social contact					
Premigration contacts in Germany	16 %		24 %		***
Health					
Premigration health satisfaction	8.1	(2.6)	8.0	(2.6)	
Number of traumatic events	1.1	(1.4)	0.8	(1.2)	***
Controls					
Age at arrival	30.9	(9.5)	31.6	(9.1)	***
Sample					
M3	30 %		26 %		***
M4	28 %		35 %		***
M5	27 %		27 %		
M6	15 %		12 %		***

Notes: Significance levels: ***: $p < 0.001$; ** $p < 0.01$; *: $p < 0.05$. CO = country of origin. 1) Variables are presented as non-standardized for illustrative purposes. 2) Those with work experience in CO. *Data source*: IAB-BAMF-SOEP Survey of Refugees 2016–2021.

In a second step, we decompose the changes in the gender employment gap between the third and the first year as well as between the sixth and the first year. Here, we apply the "interventionist" decomposition approach proposed by Kröger and Hartmann (2021). Instead of decomposing group differences at one point in time, it decomposes the difference in group differences between two points in time. Similar to the original tripartite Oaxaca-Blinder decomposition, the interventionist approach decomposes the change in group differences over time into an endowment part, a coefficient part, and an interaction part. The decomposition follows a counterfactual logic and asks how much the employment gap changes over time due to changes in the characteristics of the groups, holding the coefficients constant at their initial levels, and how much the employment gap changes over time due to changes in the coefficients of the groups, holding the initial characteristics of the groups constant. By asking how group differences change over time while allowing only either the characteristics or the effects to vary, the interventionist approach allows for a straightforward interpretation of the endowments and coefficient effects on the causes of the changing gender employment gap. The endowments part includes the part of the change in the gender employment gap that can be attributed to changes in the characteristics of both groups, while the coefficients part indicates the part that can be attributed to changes in the effects of the

Table 2
Descriptive sample characteristics by gender over duration of stay in Germany, time-varying variables.

	Duration of stay												
	1 year					3 years					6 years				
	Men		Women			Men		Women			Men		Women		
Human capital															
Recognition of credentials															
No application	75 %		83 %		*	81 %		89 %		***	82 %		87 %		**
Fully/partly recognized	7 %		2 %		**	9 %		4 %		***	10 %		5 %		***
Not recognized	1 %		0 %			1 %		1 %			2 %		1 %		
Under consideration	18 %		14 %			8 %		6 %			6 %		7 %		
Education degree in Germany	1 %		1 %			3 %		2 %		**	10 %		5 %		***
German language skills															
Language course participation	76 %		59 %		***	92 %		78 %		***	96 %		88 %		***
Postmigration language proficiency	4.7	(2.7)	3.8	(2.8)	***	6.7	(2.7)	5.5	(2.8)	***	7.6	(2.6)	6.6	(2.8)	***
Care responsibilities															
Children < 17 in household															
No children	46 %		16 %		***	43 %		15 %		***	37 %		16 %		***
Children aged between 0 and 2	21 %		31 %		***	26 %		38 %		***	20 %		21 %		
Children aged between 3 and 6	15 %		25 %		***	15 %		21 %		***	23 %		32 %		***
Children aged between 6 and 16	18 %		27 %		***	16 %		26 %		***	20 %		31 %		***
Partner in the household	29 %		51 %		***	33 %		51 %		***	36 %		54 %		***
Values															
Importance of religion	74 %		77 %			73 %		79 %		**	64 %		79 %		***
Motivation															
Connection to CO	3.4	(1.3)	3.5	(1.3)	*	3.3	(1.3)	3.4	(1.3)		3.4	(1.4)	3.5	(1.3)	
Connection to Germany	1.7	(0.7)	1.9	(0.8)		1.8	(0.8)	1.8	(0.8)		1.6	(0.9)	1.7	(0.9)	
Social contact															
Contact with Germans	56 %		47 %		***	62 %		49 %		***	61 %		40 %		***
Contact with co-ethnics	68 %		53 %		***	68 %		55 %		***	57 %		43 %		***
Contact with other immigrants	42 %		32 %		***	45 %		32 %		***	41 %		27 %		***
Health															
Mental component summary scale	49.1	(11.7)	46.4	(11.4)	***	49.1	(11.5)	47.2	(11.4)	***	50.6	(10.2)	49.5	(10.4)	
Physical component summary scale	55.1	(9.1)	51.3	(10.2)	***	54.2	(9.6)	50.2	(10.6)	***	52.7	(9.7)	49.2	(10.7)	***
Residency status															
Residence title															
Residence permission	56 %		58 %			75 %		77 %			86 %		88 %		
No residence permission	6 %		4 %			7 %		6 %		*	6 %		5 %		
Temporary resident permission	34 %		31 %		*	16 %		15 %			6 %		5 %		
Other title	4 %		7 %		**	2 %		3 %			3 %		2 %		
Length of asylum procedure, in months	7.8	(6.7)	7.0	(5.5)	**	10.7	(10.0)	11.0	(10.9)		10.8	(11.7)	11.8	(13.2)	
Discrimination															
Experience of racial discrimination	38 %		31 %		***	35 %		35 %			12 %		13 %		
Controls															
Age at arrival	31.4	(9.6)	31.8	(9.0)		31.5	(9.6)	31.9	(8.8)		32.3	(9.3)	32.3	(8.9)	
Shared accommodation	47 %		34 %		***	23 %		14 %		***	8 %		5 %		*
Unemployment rate[1])	6.6	(3.0)	6.5	(3.0)		6.2	(2.7)	6.2	(2.7)		6.4	(2.6)	6.2	(2.6)	
Population density[1])	936	(1137)	946	(1151)		968.	(1098)	918	(1066)		1171	(1187)	1044	(1137)	*
Share of foreigners[1])	12.6	(5.9)	12.8	(5.9)		14.3	(6.0)	13.9	(5.9)		16.0	(6.1)	15.9	(6.3)	
Share of children in childcare[1])	4.3	(1.2)	4.3	(1.2)		4.3	(1.1)	4.4	(1.2)		4.5	(1.1)	4.5	(1.1)	

Notes: Significance levels: ***: 0.001; ** p < 0.01; *: p < 0.05. CO = country of origin. 1) Variables are presented as non-standardized for illustrative purposes. *Data source*: IAB-BAMF-SOEP Survey of Refugees 2016–2021.

characteristics of the groups.

To address item nonresponse, we apply multiple imputation using chained equations (van Buuren, 2012). We estimate 25 imputed datasets with complete information. For each imputed dataset, we decompose the gender gap using the *xtoaxaca* Stata package provided by Kröger and Hartmann (2021). Standard errors are obtained using the bootstrapping method with 10.000 iterations. Following Rubin's (1987) approach, we then combine the results of the analyses performed on each dataset, taking into account the imputation variances within as well as between the imputed data sets. Supplemental file Tables A6–1 illustrates that missing information was present to varying degrees across measures.

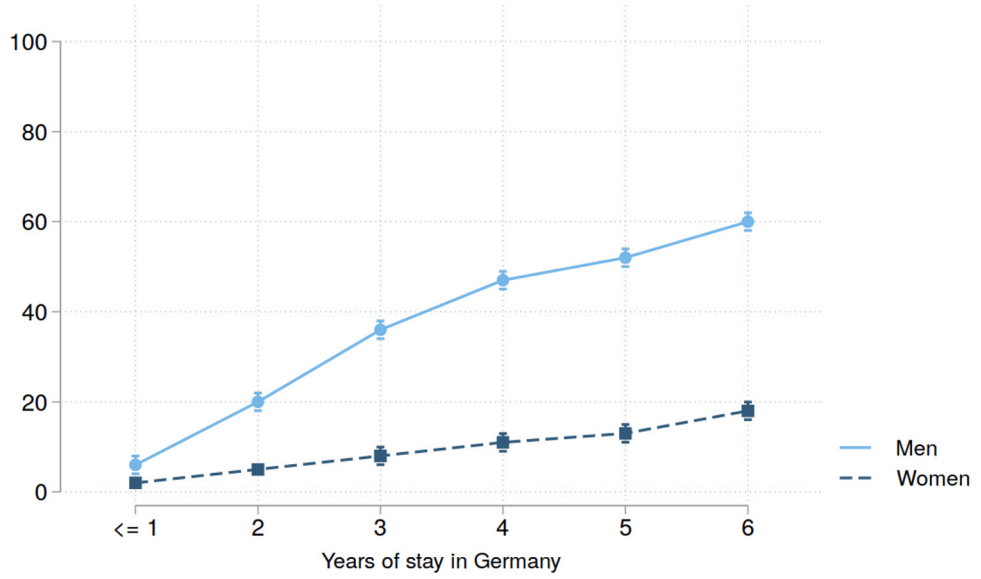

Fig. 2. Employment rate of refugees in Germany by gender (in percent) and years of stay in Germany, *Note*: Proportion of gainfully employed aged 15–64 in relation to the population of the same age. Weighted results. *Data source*: IAB-BAMF-SOEP Survey of Refugees 2016–2021.

5. Results

5.1. Compositional differences and endowments of female and male refugees

Tables 1 and 2 illustrate the mean differences in compositional characteristics among male and female refugees for the time-constant and time-varying covariates, respectively. Note that Table 2 provides changes in mean differences over the first, third, and sixth year after refugees' arrival in Germany.

Upon arrival, refugee women's human capital diverges from men's. While a larger proportion of women possess less than primary education, the representation of tertiary education is comparable (Table 1). However, women encounter distinct challenges in transferring their acquired skills to the German labor market. They are less inclined to seek credential recognition and experience lower rates of credential recognition regardless of their duration of stay in Germany (Table 2). Furthermore, the percentage of individuals with a German educational degree is equally low for both refugee women and men in the first year after arrival (1 %). However, after six years, the proportion increases to 10 % for men, while women's attainment stands at half that rate. In terms of cognitive abilities, no noteworthy discrepancies between refugee women and men are observed (Table 1). Nonetheless, men display a higher likelihood of literacy in their country of origin language.

Regarding work experience prior to migration, women possess significantly less work experience compared to men. The pre-migration work experience of women is noticeably limited, with only a third having worked prior to arrival, compared to over three-quarters of men. Even among those with work experience, men hold a significant advantage, boasting an average of 12 years compared to women's approximate 8-year average. Refugee women exhibit a higher propensity for employment in the education sector in their country of origin, while men are more commonly found in primary, secondary, and tertiary sectors.

In terms of German language skills, the initial gender disparity in language proficiency, primarily stemming from a lack thereof, emerges during the post-arrival phase (Table 2). Although both refugee women and men make progress in acquiring German language proficiency, the gender gap remains relatively constant even after six years (7.6 vs. 6.6). This discrepancy can likely be attributed to the lower participation rate of female refugees in language training programs compared to their male counterparts.

In terms of family structure, female refugees exhibit a higher likelihood of living with a partner and having children across all age categories, maintaining these patterns consistently over time. Given the lower average labor activity among women in their country of origin (Table 1), it is plausible that female refugees possess a reduced inclination to actively engage in the German labor market. Nevertheless, women demonstrate less adherence to traditional gender role values compared to their male counterparts, albeit with minor disparities. Initially, a majority of refugees (74 % for men, 77 % for women; Table 2) emphasizes the importance of religion for personal well-being. However, as six years elapse, the significance of religion wanes for men while experiencing a slight increase for women. Around half of refugee men and women migrated to Germany due to economic motives (Table 1). However, divergences in migration motives primarily revolve around family-related reasons being more prevalent among women than men. More refugee women reported pre-existing connections, such as friends or family, in Germany before their arrival. Furthermore, there are no substantial differences between refugee women and men regarding their connection to their country of origin and Germany, with these affiliations remaining stable over time (Table 2).

Over time, refugee men exhibit a notable increase in contact with native Germans, leading to a significant disparity compared to refugee women after six years (61 % versus 40 %). This trend extends to interactions with co-ethnics and other immigrants, indicating a gradual decline in social connections for refugee women. In terms of health status, there are no gender differences in pre-migration satisfaction with health among refugees (Table 1). However, men report a higher incidence of traumatic events during migration. Refugee women's mental and physical condition is worse compared to refugee men, but after six years, their mental condition increased to a level similar to that of men. It is worth noting that this satisfaction diminishes for both men and women as their duration of stay increases (Table 2). The proportion of refugees obtaining residence permission increases similarly for both men and women over the duration of stay (86 % for men, 88 % for women after six years). Initially, women seem to progress more swiftly through the asylum procedure, but this discrepancy diminishes with time. In the first year, a higher percentage of refugee men report experiencing discrimination (37.8 % versus 31.0 % for women). However, this disparity decreases over the years, and after six years, there is no

Table 3
Decomposition of the gender employment gap for refugees.

	Year 1			Year 3			Year 6		
LEVEL									
Observed difference	0.045	(0.007)	***	0.278	(0.012)	***	0.417	(0.019)	***
Endowments									
Human capital	0.019	(0.011)	*	0.028	(0.018)		0.077	(0.040)	*
Language skills	0.003	(0.005)		0.009	(0.003)	**	0.003	(0.006)	
Care responsibilities	0.008	(0.006)		0.026	(0.008)	***	0.014	(0.012)	
Gender role values	0.001	(0.002)		-0.000	(0.002)		-0.002	(0.006)	
Motivation	0.001	(0.002)		0.002	(0.001)		-0.000	(0.003)	
Social contacts	0.001	(0.003)		0.007	(0.004)	*	0.019	(0.012)	
Health	0.004	(0.004)		0.010	(0.005)	*	0.019	(0.008)	*
Residency status	-0.000	(0.001)		0.001	(0.001)		0.001	(0.003)	
Total	0.035	(0.016)	*	0.082	(0.017)	***	0.130	(0.050)	**
Coefficients									
Human capital	0.008	(0.039)		0.010	(0.031)		-0.002	(0.061)	
Language skills	-0.013	(0.023)		0.006	(0.038)		0.062	(0.105)	
Care responsibilities	-0.019	(0.023)		-0.023	(0.029)		0.018	(0.052)	
Gender role values	0.013	(0.031)		0.007	(0.035)		-0.058	(0.048)	
Motivation	-0.032	(0.046)		0.062	(0.047)		0.079	(0.078)	
Social contacts	0.015	(0.017)		-0.017	(0.025)		0.030	(0.041)	
Health	0.064	(0.095)		0.298	(0.100)	**	0.144	(0.162)	
Residency status	-0.012	(0.021)		-0.033	(0.015)		-0.019	(0.022)	
Total	-0.008	(0.023)		0.150	(0.027)	***	0.291	(0.038)	***
Interaction									
Human capital	0.010	(0.019)		0.015	(0.026)		-0.038	(0.042)	
Language skills	-0.004	(0.006)		0.003	(0.008)		0.005	(0.013)	
Care responsibilities	0.007	(0.009)		0.010	(0.010)		0.008	(0.015)	
Gender role values	0.000	(0.003)		-0.001	(0.004)		0.005	(0.008)	
Motivation	0.002	(0.003)		-0.001	(0.002)		-0.000	(0.004)	
Social contacts	0.003	(0.005)		0.008	(0.007)		0.024	(0.017)	
Health	0.001	(0.007)		0.013	(0.007)	*	0.003	(0.011)	
Residency status	0.000	(0.002)		-0.004	(0.002)		-0.001	(0.004)	
Total	0.017	(0.028)		0.045	(0.032)		-0.003	(0.055)	
CHANGE									
Observed change in difference	0.000	(0.000)		0.233	(0.013)	***	0.372	(0.020)	***
Endowments									
Human capital	0.000	(0.000)		0.004	(0.004)		0.017	(0.010)	
Language skills	0.000	(0.000)		-0.002	(0.010)		-0.004	(0.014)	
Care responsibilities	0.000	(0.000)		-0.001	(0.003)		-0.005	(0.004)	
Gender role values	0.000	(0.000)		0.001	(0.002)		0.001	(0.002)	
Motivation	0.000	(0.000)		0.000	(0.003)		-0.002	(0.005)	
Social contacts	0.000	(0.000)		0.004	(0.002)	*	0.005	(0.004)	
Health	0.000	(0.000)		0.000	(0.002)		0.001	(0.004)	
Residency status	0.000	(0.000)		0.004	(0.008)		0.007	(0.012)	
Total	0.000	(0.000)		0.019	(0.015)		0.038	(0.034)	
Coefficients									
Human capital	0.000	(0.000)		0.017	(0.065)		0.013	(0.107)	
Language skills	0.000	(0.000)		0.021	(0.050)		0.064	(0.103)	
Care responsibilities	0.000	(0.000)		0.014	(0.032)		0.065	(0.052)	
Gender role values	0.000	(0.000)		-0.007	(0.047)		-0.073	(0.058)	
Motivation	0.000	(0.000)		0.095	(0.067)		0.111	(0.084)	
Social contacts	0.000	(0.000)		-0.033	(0.031)		0.037	(0.062)	
Health	0.000	(0.000)		0.253	(0.110)	*	0.101	(0.187)	
Residency status	0.000	(0.000)		-0.038	(0.029)		-0.067	(0.038)	
Total	0.000	(0.000)		0.200	(0.023)	***	0.279	(0.063)	***
Interaction									
Human capital	0.000	(0.000)		-0.006	(0.005)		-0.031	(0.015)	
Language skills	0.000	(0.000)		0.013	(0.016)		0.023	(0.038)	
Care responsibilities	0.000	(0.000)		0.003	(0.003)		-0.017	(0.009)	
Gender role values	0.000	(0.000)		-0.003	(0.003)		0.002	(0.006)	
Motivation	0.000	(0.000)		-0.004	(0.004)		-0.002	(0.009)	
Social contacts	0.000	(0.000)		0.009	(0.003)	**	0.013	(0.010)	
Health	0.000	(0.000)		-0.001	(0.003)		-0.006	(0.011)	
Residency status	0.000	(0.000)		0.010	(0.013)		0.053	(0.032)	*
Total	0.000	(0.000)		0.014	(0.024)		0.056	(0.072)	

Notes: Significance levels: ***: $p < 0.01$; ** $p < 0.05$; *: $p < 0.1$. *Data source*: IAB-BAMF-SOEP Survey of Refugees 2016–2021.

notable difference in reported discrimination between refugee women and men.

The regional characteristics (unemployment rate, share of foreigners, population density, and childcare coverage) show no significant differences between refugee women and men. Additionally, both refugee women and men arrive in Germany at a similar age, around 31–32 years (Table 1). Lastly, refugee men are more likely to reside in shared accommodations both in the first year after arrival (47 % vs. 34 %) and six years after arrival (8 % vs. 5 %).

The descriptive results align with previous findings on refugees in Germany, indicating lower human capital, increased family responsibilities, less traditional gender roles, and limited social contacts for refugee women compared to men. We observe persistent or widening gaps in formal recognition of educational certificates, language

proficiency, the importance of religion, and social contact (particularly with Germans) over time. The subsequent analysis explores the impact of these factors on the employment prospects of refugee women relative to men.

5.2. Gender employment gap over the duration of stay among refugees

Fig. 2 shows how refugee women's and men's employment rates develop in the years after their arrival. In the year of arrival, the employment rate of refugee women is 1 %, while that of men is 6 %. In relative terms, this means that the female employment rate was around 17 % of the level of men. Over the course of their stay, the employment rate of refugee women increases only slightly to 20 %, while that of refugee men rises to 64 %, i.e., female employment rates reached 31 % of the level for men. Thus, the initially modest gender gap widens to a gap of 42 % points after six years.

5.3. Explained and unexplained portions of the gender employment gap among refugees

Next, we examine the contributions of the mechanisms identified in the literature to explain the gender employment gap among refugees. Table 3 presents the results of Blinder-Oaxaca decompositions of gender employment differences for refugees (detailed model results can be found in Supplemental files Section B).

The upper part of Table 3 ('Level') highlights that the gender employment gap among refugees is initially 4.5 %-points in the first year since arrival. Of this gap, 73 % (equivalent to 3.5 %-points) can be attributed to differences in the characteristics of refugee women and men. Closer inspection reveals that pre-migration human capital differences – in particular, industry sector differences in the country of origin – as well as the childcare responsibilities (i.e., the age of the youngest child in the household) play a role in driving the initial gender gap (Table B2 in Supplemental files). Other labor market-related resources contribute minimally to the initial gender employment gap.

After three and six years in Germany, the gender employment gap expanded to 27.8 and 41.7 %-points, respectively (Table 3). Surprisingly, these gaps are not primarily influenced by the higher labor market-related resources of refugee men but rather by the valuation of refugee women's characteristics. Three years after arrival, gender differences in characteristics account for only 29 % (equivalent to 8.2 %-points) of the gender employment gap, while after six years, it accounts for 31 % (equivalent to 13.0 %-points). Notably, gender disparities in the industry sector in the country of origin, obtainment of an educational degree in Germany, women's lower German language proficiency and greater childcare responsibilities are key drivers of the gender employment gap (Table B2 in Supplemental files).

However, the majority of the gender gap is attributable to the different effects of refugee women's and men's characteristics after three years (53.9 % or 15 %-points) and six years (69.7 % or 29 %-points) of arrival (Table 3). Specifically, factors such as women's health status (14 %-points), contact with Germans (4.6 %-points), and childcare responsibilities for children between 0 and 2 years of age (2.7 %-points) have more adverse effects on women's employment rate compared to men's three years after arrival (Table B2 in Supplemental files). These detrimental effects of women's characteristics further escalate after six years.

The lower part of Table 3 ('Change') reveals the dynamics of the employment gap among refugee women and men over time and provides insights into how these dynamics can be attributed to changing characteristics and their changing effects on employment. The initial modest gender employment gap has increased by 23.3 %-points three years after arrival and by 37.2 %-points after six years. Changes in refugee women's and men's characteristics account for 3.8 %-points (10 %) to the widened employment gap after six years, while changing effects of these characteristics contribute 27.9 %-points (75 %). Regarding endowments, a growing disparity in human capital adds 1.7 %-points (4.6 %) to the increasing gender employment gap after six years. This is primarily driven by the greater propensity of refugee men to obtain a German educational certificate and to have contact with Germans (Table B3 in Supplemental files). In contrast, different developments in other characteristics such as values, motivation, or care responsibilities have minimal impact on the expanding gender employment gap.

However, more significant than growing differences in endowments are the declining returns of women's experiences in their sector of employment before migration, having contact with Germans, their health as well as the increasingly detrimental effects of having children below age 6 (Table B4 in Supplemental files). For instance, if refugee women's experience of working in the tertiary sector prior to migration had the same returns six years after arrival as it did initially, the gender employment gap would be 3.6 %-points smaller. Likewise, if their mental condition had the same returns six years after arrival as it did initially, the gender employment gap would be 6.5 %-points smaller. Therefore, our findings indicate that refugee women face increasing challenges in leveraging their health and human and social capital for employment, with childcare responsibilities posing additional hurdles compared to men. These findings persist even when considering other factors such as gender role values or perceived discrimination.

Overall, our findings align with the expectation that labor market disadvantages in relevant resources hinder refugee women's employment in the early periods after arrival. At the same time and contrary to our expectations, the gender employment gap widens in the years following arrival not because refugee women lag behind in labor market-relevant resources but rather due to their inability to fully capitalize on these resources compared to men, coupled with the primary responsibility for childcare.

6. Discussion and conclusions

One of the major political and societal challenges accompanying the worldwide increase in forced migration is the labor market integration of refugees, particularly refugee women, in the receiving countries. Existing research has highlighted the employment struggles faced by refugee women compared to their male counterparts (see Kosyakova & Kogan, 2022). In this study, we aimed to empirically investigate the factors driving the labor market disadvantage of refugee women that is observed in many receiving countries. By analyzing rich panel data, we examined changes in employment trajectories of the recent female and male refugees in Germany and identified the drivers of diverging employment patterns.

Our analyses revealed a clear employment gender gap during the initial years after arrival in Germany. Based on the theoretical arguments offered in the literature, we anticipated that female refugees would face a disadvantaged starting position due to the lower resource endowment necessary to gain a foothold in the labor market. Our results confirmed this expectation, as refugee women had lower educational attainment, different types of human capital, lower German skills, increased care responsibilities, limited contacts beyond family networks, and health issues. Over time, the gender employment gap among refugees expanded considerably, primarily driven by significant employment gains among refugee men, while the progress of women in employment remained modest.

With our longitudinal data, we had the rare possibility of applying decomposition techniques to disentangle the relevance of initial resource differences. In the early years after arrival, we find evidence for the importance of human capital. Rather than the level of pre-migration educational attainment, the type of job before migration played a role in the emergence of the gender gap among refugees. In the years following their arrival, the importance of different characteristics for the gender gap in employment diminishes. Instead, our study shows that the diminishing returns to health, contact with Germans and pre-migration type of work over the course of their stay are the main drivers of the

widening gender employment gap in the medium and long term, outweighing the impact of differences in resource endowments. Moreover, childcare responsibilities pose additional and higher hurdles for women compared to men. These findings persist even after controlling for factors such as gender role values or perceived discrimination.

One reason for the relative decline in the value of refugee women's pre-migration human capital over time may be that refugee men invest more to maintain or increase their human capital. As we have argued, refugee women's higher costs of acquiring the appropriate target-specific knowledge, their greater care responsibilities, poorer health, as well as lower and more uncertain returns may contribute to their lower human capital investments. Experimental evidence suggests that discrimination against women may also play a role (e.g., Di Stasio & Larsen, 2020). Regardless of the underlying causes, our findings are consistent with prior literature, suggesting that women's human capital tends to be less valued in the labor market (Kilbourne et al., 1994; Lauer, 2005; McDonald & Day, 2010). Furthermore, the finding that having children has increasingly detrimental effects on refugee women's employment chances over the duration of their stay also suggests that children hamper their acquisition of host-country-specific capital. Alternatively, refugee women may decide to take care of children at home more often as refugee men's chances of being employed increase over time. More puzzling are the diminishing returns to health for women compared to men. While more research is needed on this topic, one explanation may be that poor mental health is less relevant for men due to their predominantly manual work that requires rather good physical health. For women, deteriorating mental health has a greater negative impact on their ability to work because they are more likely to be employed in non-manual jobs.

Reasons for the widening employment gender gap in returns to contact with Germans remain open but may be related to men's more strategic use of network resources for job search, more frequent contact with Germans and thus more opportunities to obtain useful information about job opportunities, and a more favorable network composition with respect to information about job opportunities (Cheung & Phillimore, 2017; Hagan, 1998; McDonald & Day, 2010). While our data do not allow us to explore this issue in more detail, we believe it is a worthwhile topic for further research.

Overall, our findings align with the cumulative disadvantage thesis (DiPrete & Eirich, 2006; see also Merton, 1968) or resource multiplication perspective (Ross & Mirowsky, 2006). These theories highlight the significance of insufficient resources that can accumulate or interact to impact labor market outcomes, intensifying over an individual's career. Specifically, our results reveal that the cumulative disadvantage experienced by refugee women is not primarily a result of their lower resource accumulation but of their lower returns to socioeconomic resources. In DiPrete & Eirich's (2006) framework, it is the Blau-Duncan form (Blau & Duncan, 1967) rather than the strict form of cumulative advantage that contributes to the widening employment gap between refugee women and men.

In this respect, our findings add to a growing body of literature advocating for a dynamic perspective in the study of immigrant labor market integration and labor market inequality more generally (Fauser, 2020; Gangl, 2006; Kreisberg, 2019). However, existing studies predominantly focus on cumulative disadvantage based on resource accumulation (e.g., see Birkelund et al., 2017; Cheng, 2014; Parolin & VanHeuvelen, 2023). Our results highlight the equally detrimental consequences of unequal returns on labor market inequalities between different groups.

Our findings provide valuable insights into the gendered refugee labor market disparities and how they evolve over time in receiving countries. There are, however, limitations and unanswered questions that warrant future research. Generalizing the results beyond Germany is restricted due to country-specific labor market boundaries and the role of credentials. At the same time, despite the erosion of the male breadwinner model, the gendered division of domestic and paid work endures via Germany's social and family policies (Trappe et al., 2015). Exploring the gendered perspective across countries with different welfare regimes would provide a more comprehensive understanding of how cultural and institutional structures shape gender inequalities among refugees in host labor markets (Sainsbury, 2006). Additionally, investigating the role of immigration and integration policies (Kanas & Steinmetz, 2021) could shed more light on the selection processes and the observed gendered patterns in the integration outcomes. Considering that the gender gap among refugees is growing in Germany but not in other countries (e.g., Bakker et al., 2017; Brell et al., 2020; Kanas & Steinmetz, 2021), we believe that this is a promising avenue for future research.

Further research should also extend the observation period to assess whether refugee women can narrow the employment gender gap over a longer time frame. Additionally, considering variations of gender differences in refugee groups (e.g., between mass refugees and political refugees or internally displaced persons) and in comparison to non-refugee immigrant groups such as economic immigrants, family immigrants, or repatriates would enhance our understanding. However, addressing these issues requires larger sample sizes than currently available. Moreover, the data did not allow us to consider the impact of wearing a hijab, which is known to influence Muslim women's labor market outcomes (Fernández-Reino et al., 2022; Salikutluk & Menke, 2021). Due to data limitations, we were unable to examine arguments related to differences in men's and women's work orientations (Kosyakova, Gundacker et al., 2022; Salikutluk & Menke, 2021). However, we believe that incorporating both economic migration motives and gender role values in our analysis mitigates the potential impact of this omission on our findings. Therefore, we do not anticipate that this limitation significantly alters the conclusions drawn from our study. Finally, while we were able to account for the panel structure of our data, the decomposition methods required to decompose changes in the gender gap over time did not allow us to account for the household structure of the data. While we don't expect our results to change significantly, taking household structure into account may increase standard errors.

From a policy perspective, it is crucial to recognize that the labor market disadvantage of female refugees is not due to a lack of motivation to work. Our results indicate that these have pronounced aspirations for employment. Therefore, policymakers should focus on supporting the labor market integration of refugee women, particularly given the ongoing conflict in Ukraine and the increasing number of refugee women in the Western Hemisphere (UNHCR, 2022). In particular, both female refugees and the receiving countries would greatly benefit from formal recognition of women's foreign qualifications. Currently, Germany allows recent refugees from Ukraine to work as teachers or integration supporters at school. As a substantial part of female refugees from Syria and other countries who arrived between 2013 and 2016 worked as teachers in their home countries, they possess qualifications to assist younger refugees in the new countries' educational system. Furthermore, Germany – like many other European countries – urgently needs caregivers in nursing homes. Again, the significant number of female refugees with work experience in the health sector calls for formal recognition of their qualifications and on-the-job-trainings to enhance their employment chances in skilled occupations.

Moreover, female refugees with limited proficiency in the receiving-country language would benefit from improved language course opportunities early after arrival. To facilitate language course participation and enhance labor market integration, it is essential to extend childcare options. Rather than gender role orientations, factual care responsibilities seem to be the main barrier for female refugees in labor market participation. Early acquisition of language skills also enables refugee women to establish contacts with non-refugee immigrants and native communities, which play a vital role in finding employment and accessing information on childcare options and the labor market requirements. To reckon, the examination of refugee disadvantages

through the gender lens gives valuable insights into the deficiencies on multiple fronts that can be addressed through diverse policies. Only through concerted effort can the immigrant and particularly refugee gender differences be reduced.

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Declaration of Competing Interest

None.

Data availability

The data analysed in this study is subject to the following licenses/restrictions: This article uses the factually anonymous data of waves 2016–2021 of the IAB-BAMF-SOEP Survey of Refugees (DOI: 10.5684/soep.iab-bamf-soep-mig.2021). The IAB-BAMF-SOEP Survey of Refugees is a representative longitudinal survey by the Institute for Employment Research (IAB), the research data center of the Federal German Office for Migration and Refugees (BAMF), and the German Socio-Economic Panel (SOEP) at the German Institute for Economic Research (DIW). Data access was provided via a Scientific Use File supplied by the Research Data Centre (FDZ) of the German Federal Employment Agency (BA) at the IAB. All documentation concerning both survey and including questionnaires and data manuals are made available by the FDZ (https://fdz.iab.de/en/our-data-products/individual-and-household-data/iab-bamf-soep/) and DIW (https://www.diw.de/en/diw_01.c.603160.en/integrated_studies.html). Due to the German Data Protection legislation, we cannot make the original data from the IAB-BAMF-SOEP Survey of Refugees. Researchers can, however, apply for data access via the FDZ or DIW. Requests to access these datasets should be directed to https://fdz.iab.de/en/data-access/scientific-use-files/. The computer codes for data preparation and analyses are available at https://osf.io/htp29/. This study design and analysis was not preregistered.

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Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.rssm.2023.100842.

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