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Growth, Wages and Unemployment - The Economic Impact of Refugee Migration on Europe: A Synthetic Control Analysis

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Content

1 INTRODUCTION

During the year 2015 almost 1.4 million refugees arrived in Europe (eurostat, 2020). Germany was with 1.1 million individuals the major destination (Statista, 2018). A huge political divide occurred over this influx. While welcoming scenes dominated the media in the advent of the so called 'refugee crisis', criticism over the 'We'll-make-it policy' by Angela Merkel increased also among Christian Democrats.1A sudden human influx of such size into a society might not only have political, cultural and social impacts, but may also lead to economic disruptions. Human beings embody consumers as well as labour force. A significant increase in population might thus cause an increase in demand for commodities and in labour supply, which ceteris paribus simultaneously lead to increasing GDP and decreasing wages. Previous literature utilized quasi-natural experiments which can be exploited in social sciences for the detection of causal relations and the usage of methods, not applicable otherwise. The present paper applies the synthetic control methodology to wages, unemployment and economic growth in Germany in order to measure the causal impact of the 2015- refugee influx on these economic key elements. No impact on either of the economic factors has been found.

European Union labour market and welfare policies are concerned with the protection of European citizens from disruptive processes. Falling wages and increasing unemployment, as well as decreasing production and consumption embody highly disruptive political potential. Thus, the findings concerning the impact of refugee migration into the European Union might influence EU-policies in the prospect of increased migration to Europe in the upcoming century due climate change and new crises.

The remainder of the article is organized as follows: The lessons from the key literature concerning quasi- natural experiments and the impact of migration on wages, unemployment and economic growth are provided in section 2. Section 3 comprises the theoretical framework concerning the differences between refugees and economic migrants. Section 4 introduces the estimation strategy, while section 5 presents data and descriptive statistics. Section 6 shows the simulation results, followed by the concluding discussion in section 7.

2 LITERATURE REVIEW

2.1 THE MARIEL LESSON

The seminal work by Card (1990) utilizes a quasi-natural experiment in order to measure the impact of immigration on native wages, employment- and unemployment rates. Between April 1980 and June 1981, 125 thousand Cuban individuals, the so-called *Mariels* or *Marielitos*, arrived in Miami and increased the Miami labour force with 55700 individuals by 8.4 per-

[1] German chancellor Angela Merkel's phrase "Wir schaffen das!" (engl. We'll make it!) became the metaphor for the open-border policy the government applied during the refugee crisis. Germany opened its borders to hundreds of thousands of refugees, which has not only been criticized by far-right politicians such as Alexander Gauland (Die Welt , 2015), but also by party colleagues and allies from the Christian Social Union such as Horst Seehofer, prime minister of Bavaria in those days, who had been afraid that the process of refugee inflows could not be stopped anymore (Spiegel Online, 2015).

cent.[2] The share of Cuban workers in Miami increased by 20 percent. This sudden influx of additional labour force was expected to have an impact on the wage rates of native workers and particularly on formerly immigrated Cubans of the same skill-level. Card utilizes individual micro-data from the merged outgoing rotation group samples of the Current Population Survey (CPS) and analyses the interval between 1979 and 1985. He takes the age group of 16-61 and looks separately for the impacts on the major subpopulations in Miami, i.e. 'whites non- Hispanic', 'black non-Hispanic', 'Cuban foreign- and native-born', as well as 'other Hispanics'. The cities of Atlanta, Los Angeles, Houston, and Tampa-St. Petersburg are selected for comparative purposes and argued for as similar to Miami in their economic growth pattern. Since the general skill- level and English language ability was comparably low among the *Mariels*, these were more employed in the service sector and as 'laborers'. Card finds an unadjusted 'raw' wage gap of 34 percent between formerly immigrated Cubans and the newly arrived *Mariels*, which shrinks to a significant level of 18 percent, when socio-economic confounders such as educational attainment and work experience are controlled for. Counterintuitively, when mean log wages are compared in a linear regression framework, no impact on any of the subgroups can be detected, and neither pertaining to unemployment rates or employment-to-population ratios. Possible answers to this 'rapid absorption' of migrants are the industry structure in Miami that could employ the Marielitos, and the former migration flow to Miami which might have allowed English language skills as not such vital for employability as in other parts of the country.

Meanwhile highly disputed and influential, the reassessment of the *Mariel Boatlift* is taken up by Borjas (2017). He enriches the analysis with additional data from the CPS Outgoing Rotation Groups (ORG) and new methodological approaches such as synthetic control methods. Instead of solely using four arbitrary chosen cities for the creation of a control group Miami is compared with, Borjas shows the outcome by different rotations of cities and creates an optimized synthetic control Miami. Borjas finds a significant negative impact on the wages of native high school dropouts by 10 to 30 percent. As emphasized by Borjas (2003), the precision in the matching of wages with skill groups is decisive. 60 percent of the Marielitos were high school dropouts, which increased the share of those in Miami by 20 percent. Card's data selection with 16-61 years were contaminated with those individuals who were still students enrolled in school and thus, it was not merely the high school dropouts whose wages were measured, but actually those of high school students, who are of different skill group than the majority of the *Mariels*.

Borjas restricts his analysis to males only, between 25-59 years of age, who were non- Cuban, non- Hispanic, and who had self-reported positive earnings, positive weeks worked and who did not earn less than 1.50 USD and more than 40 USD per hour. The time interval analysed is 1977 to 1993. He justifies his choices with probable 'contamination' of data by transitory individuals from school to work or work to retirement, the increasing number of women in the labour force, avoiding the comparison to non-natives and the 'Little Mariel', an additional influx of Cuban refugees in 1994. These data restrictions lead to a minimum of 4 observations (max.27) in the CPS data in some years and 15 observations (max. 56) in the compound CPS-ORG dataset. Borjas uses a three-year moving average in order to circumvent the micronumerosity problem. Peri and Yasenov (2019) argue, Borjas findings were not only driven by his highly restrictive data selection, but also by measurement error in the CPS and CPS-ORG data sets before 1979. They relax the data restrictions including control variables for ethnicity, gender and age, and also extend their analysis up to 1972. They find a down-

[2] Card (1990) worked with the number of 45 thousand individuals and an increase by 7 percent, while later research adapted the more precise quantities.

ward trend in the data when the time interval is enlarged, which is not observable under Borjas' restrictions. The data smoothing applied by Borjas masks other important aspects. The difference between actual Miami and synthetic Miami becomes insignificant under all permutations. Clemens and Hunt (2019) support this finding and argue Borjas' findings were driven by the negligence of the increasing importance of black workers on the Miami labour market. Borjas (2016, 2019) controverts these findings with the reference to misclassification of individuals (Peri and Yasenov, 2015, 2019) and the influx of black workers after the *Mariel Boatlift* already happened (Clemens and Hunt, 2019).

Although 'unambiguous' results (Borjas, 2017, p.1103) and 'final goals' (Peri and Yasenov, 2015) are sometimes proclaimed, the clear unambiguity of the discussion lies in the finding that empirical evidence pertaining to the wage impact of immigrants is highly dependent on methods used, data selected, observations included, and time frames observed. As Borjas (2017, p. 1108) underlines, the synthetic control method partially constraints the arbitrariness of the researcher in the creation of the control group due to its optimizing algorithm, but covariates included, and cities chosen in the procedure still have a nonnegligible impact on the outcome.

2.2 Migration and Economic Growth

The direct link between migration and economic growth or net gain from migration, the so-called 'immigration surplus' (Borjas, 2014), is a rather new field of econometric investigation. Borjas (2014, p.158) conducts a simulation analysis and finds a small but significant positive impact on GDP of 0.2 to 0.5 percent when capital is perfectly inelastic and 0.03 percent when capital is elastic. Boubtane, Dumont and Rault (2016) investigate the impact of migration on economic growth for 22 OECD countries and the time interval of 1986 to 2006. They find a positve impact of migrants' aquired skills on GDP per capita and also a long term benefit of permanent migration flows on GDP per worker. Surprisingly and counter Borjas (2016, Chapter 8) and Borjas (2019), they even find a large and positive impact on GDP growth, when countries do not apply selective migration policies. Kane and Rutledge (2018) analyse the impact of migration on economic performance of fifty U.S. states between 1980 and 2015 and find a positiv impact on per capita GDP and per capita GDP growth. Borjas' (2019) findings partially contradict other findings. Borjas investigates the period between 1960 and 2017 and finds that a one percent increase in the migrant share induces an increase in *Gross State Product* (GSP) by 3.2 percent, which becomes insignificant for per-capita GSP. Using IV regression he finds a causal and positive impact on GSP by 1.9 percent for a one-percentage point increase in the migrant share, which becomes insignificant when per-capita GSP is considered. Borjas concludes that the association between migration and GDP is at best zero and strong positive findings are mainly driven by data manipulation, which is not supported by other authors.

2.3 Forced Migration to Europe

Previous literature, including the *Mariel Boatlift*, mainly focuses on the impact of individuals, who emigrated voluntarily or semi- voluntarily and their collective impacts on local labour markets.[3] However, the impact of refugee migration, i.e. those who were forced to migrate by conflicts or disasters, might be quite different than by economic migrants (Fasani, 2016;

[3] The term 'voluntary' is obviously no clear-cut terminology, but is used here in comparison to those, who were forced to migrate by immediate threat of death and huge material losses.

Becker and Ferrara, 2019). Tumen (2016) is the first who exploits the quasi-experimental nature of the Syrian refugee influx.[4] He uses a difference-in-differences setting and analyses the economic impacts of the refugees on local markets in Turkey close to the Syrian border. He finds small but significant wage losses for native workers in the informal sector, but no wage decreases in the formal sector. Due to the decrease in labour costs, prices for goods produced in the informal sector dropped, while prices for higher-quality housing increased, since refugees mainly chose cheap housing options and natives shifted to other neighbourhoods. The experiences in Turkey as a final destination and transit country, and semi-European state are important. As Tumen points out, those who arrived in Germany in 2015, had their first stage in Turkey, from 2012 to 2014. A second important insight is from the informal sector. Refugee labour increased overall labour supply in Turkey because the informal sector could utilize it, which is not the case in Germany at this magnitude. Gehrsitz and Ungerer (2017) analyse the impact of the 2015-refugee influx on the German labour market, crime rates and voting behaviour. They find no displacement of native workers, but rather negative impacts on refugees themselves in finding jobs. While no impact on voting behaviour is detected, very small increases in crime rates with respect to drug offenses are found. Huang and Kvasnicka (2019) use county-level data and do not find significant impacts on crime rates in Germany.

Previous research utilized natural experiments in the analysis of sudden migration and refugee inflows. Impacts on overall wages have not been found, while findings pertaining to skill-levels are ambiguous. No impact on unemployment rates among natives has been detected. Economic growth is positively associated with migration, which becomes less clear when per-capita GDP is considered. Most of the literature is concerned with economic migrants, which are mainly driven by economic incentives and have some degree of freedom in the selection of the particular destination country. However, refugees have particular characteristics which distinguish them from other migrants and whose impact on local labour markets might be quite different. The present paper contributes to the literature in this sense. It utilizes the 2015-refugee influx into Europe and Germany, and analyses the impact on wages, unemployment rates and economic growth.

3 THEORETICAL FRAMEWORK

The canonical textbook model of labour supply predicts decreasing wages for competing native workers if a *ceteris paribus* labour supply shock of substituting labour occurs (Borjas, 2003, 2014). A second strand of argument concerning the determination of wages in relation to migrant labour supply uses the *Roy model* (Roy, 1951; Borjas, 1987; Borjas, Kauppinen and Poutvaara, 2018). Migrants self-select themselves with regard to differences in the rate of return to skills. Those destination countries are chosen where the gain to the migrant's skills is highest, which creates non-random migration flows to particular countries. Based on the prediction that wages will decrease due to migration, the duration and probability of unemployment could increase according to standard search and matching models. Search intensity increases with lower opportunity costs and thus, a prolonged duration in unemployment should be observable (Pissarides, 1990, p.72). Theories directly linking migration and economic growth are rather scarce. Borjas (2019) utilizes the classical Solow growth model

[4] Becker and Ferrara (2019) provide a detailed review of the recent literature on forced migration and its impact on source and host countries, wages, prices and the refugees themselves. Edo (2019) reviews the recent literature on the wage and employment impact of immigration. For a review of historical refugee inflows and their impacts on western European countries, see Borjas and Monras (2017).

and links skill-level, wages and economic growth. He derives the following important conclusions.

1. A one-time supply shock increases GDP.
2. A one- time supply shock does not have any impact on steady-state per-capita income.
3. A one-time supply shock decreases per-capita income.
4. A one-time supply shock reduces wages.
5. Continuous inflows of migrants increase GDP but reduce per-capita income.
6. High-skill workers are more beneficial to economic growth than low-skill.
7. Per-capita income of natives will decline, if the skill level of migrants is comparably low.
8. Even if migrants are slightly more skilled than natives, per-capita income does not increase
9. The net impact of immigration depends on the direction of many components and is not clearly predictable.

While Borjas' predictions pertaining to GDP growth are in line with this paper, none of the above-mentioned theories on migration are directly applicable to the refugee influx of 2015 to Germany. The following arguments point out distinctive characteristics of refugee migration, which show why canonical theories of migration fail to predict the impact.

1. Compared to legal labour migration, the ability of self-selection for refugee migrants is constrained. The final destination and duration at a transit place is often the outcome of processes not under control of the refugee or coincidence (Becker & Ferrara, 2019). Refugees in Germany are allocated according to the *Königsteiner Schlüssel* and their distribution can be optimized by governmental institutions due to market criteria.[5]
2. Refugees have no working permit and thus, do not supply labour. The informal sector in Germany is much smaller than in other countries, which constraints refugees to enter the labour market.
3. A huge share of the 2015- refugees were children and of young age, who were not permitted to work.
4. Many Middle-Eastern countries have a classical gender division of labour into household and market work. Even those women who could have participated in the labour market could have stayed at home for household work, which further reduces market labour supply of refugees and thus the impact on native wages.
5. The language barrier detains refugees from entering the labour market in Germany, which is not a barrier if source and host country share the same language.

[5] As Aksoy and Poutvaara (2019) show, economic selectivity is not absent among refugees but much less existent among them than among economic migrants.

6. Uncertainty pertaining to future prospects leads to lower investments into country-specific human capital, such as language skills and networks and is psychologically distracting, which lowers productivity (Brell, Dustmann, & Preston, 2020).
7. The productivity of refugees deteriorates due to long stays in refugee camps and absence from the labour market, which makes them less competitive to native workers (Brell, Dustmann, & Preston, 2020).
8. Traumata and psychological illnesses make refugees less productive in general.
9. The general physiological health status of refugees is worse than that of natives or labour migrants, which makes them less competitive.
10. Minimum wages are protective. Germany adapted a minimum wage in 2015. The higher the minimum wage, the smaller the impact of labour supply shocks on incomes (Edo and Rapport, 2019)
11. Industries adapt to refugee inflows (Lewis, 2004). Markets can absorb huge amounts of labour, since the industry can employ more low-skilled labour as indicated by the case of Miami.
12. Labour markets can become more efficient in the presence of labour supply shocks (Anastasopoulos, Borjas, Cook, & Lachanski, 2019).[6]
13. Native adjustment: Not only firms can relocate, but also individuals who could have migrated into a particular market can avoid doing so and thereby relax the impact of the additional labour supply to local markets.
14. Refugees are not only producers but also consumers which can produce positive externalities due to multiplier effects on the goods market and thus increase demand for native workers.

Hypotheses

Based on the discussion above it is hypothesized that no differences between synthetic Germany and actual Germany will be observed with respect to wages, unemployment and economic growth.

4 ESTIMATION STRATEGY

Following Abadie and Gardeazabal (2003) and Abadie, Diamond and Hainmueller (2010, 2015), sets of countries $J+1$ for $t = 1, \dots, T$ time periods are observed for each of the three variables. It is assumed that only country $i = 1$, i.e. Germany has been hit by the refugee influx, while the unaffected countries $i = 2, \dots, J+1$ serve as the potential *donor pool* for the creation of a synthetic, i.e. artificial Germany, actual Germany is compared with. T is divided into two intervals, the pre-influx interval $T_{pre2015}$, with $1 \leq T_{pre2015} < T$, and the post-influx interval $T_{post2015}$, with $T_{pre2015} < T_{post2015}$, both consist of multiple periods. GDP_{it}^{none} is the GDP per capita that would be observed for country i in period t in the absence of the refugee

[6] Anastasopoulos, Borjas, Cook, and Lachanski (2019) argue that Miami's Beveridge Curve shifted inwards after the Mariel influx and thus, the labour market of Miami became more efficient with respect to vacancies and unemployment.

influx, while GDP_{it}^{Influx} is the per capita GDP of country i in period t when country i is hit by the influx. UR_{it}^{none} (UR_{it}^{Influx}) and $Wages_{it}^{none}$ ($Wages_{it}^{Influx}$) are analogously the respective values for unemployment rates and average wages. It is assumed that the influx is not anticipated and $GDP_{it}^{none} = GDP_{it}^{Influx}$, $UR_{it}^{none} = UR_{it}^{Influx}$, $Wages_{it}^{none} = Wages_{it}^{Influx}$ are equal for all countries in the periods $T_{pre2015}$. The aim of the present research is the estimation of the differences α_{it}, β_{it} and γ_{it} respectively between GDP_{it}^{none} and GDP_{it}^{Influx}, UR_{it}^{none} and UR_{it}^{Influx} and $Wages_{it}^{none}$ and $Wages_{it}^{Influx}$ in the post-influx periods $T_{post2015}$, i.e. $\alpha_{it} = GDP_{it}^{Influx} - GDP_{it}^{none}$, $\beta_{it} = UR_{it}^{Influx} - UR_{it}^{none}$, and $\gamma_{it} = Wages_{it}^{Influx} - Wages_{it}^{none}$, such that the differences in the pre-influx period are minimized. As Abadie *et al*. (2010) argue, since GDP_{it}^{Influx}, UR_{it}^{Influx} and $Wages_{it}^{Influx}$ are observed, it is sufficient to estimate GDP_{it}^{none}, UR_{it}^{none} and $Wages_{it}^{none}$ as follows:

$$GDP_{it}^{none} = \delta_{t1} + \boldsymbol{\theta}_{t1}\boldsymbol{Z}_{i1} + \boldsymbol{\lambda}_{t1}\boldsymbol{\mu}_{i1} + \varepsilon_{it1} \quad (1)$$

$$UR_{it}^{none} = \delta_{t2} + \boldsymbol{\theta}_{t2}\boldsymbol{Z}_{i2} + \boldsymbol{\lambda}_{t2}\boldsymbol{\mu}_{i2} + \varepsilon_{it2} \quad (2)$$

$$Wages_{it}^{none} = \delta_{t3} + \boldsymbol{\theta}_{t3}\boldsymbol{Z}_{i3} + \boldsymbol{\lambda}_{t3}\boldsymbol{\mu}_{i3} + \varepsilon_{it3} \quad (3)$$

where the δ_ts are unknown common trends with constant factor loadings, the $\boldsymbol{Z}_i$s vectors of observed covariates and the $\boldsymbol{\theta}_t$s the vectors of pertaining parameters. The $\boldsymbol{\mu}_i$s and $\boldsymbol{\lambda}_t$s are vectors of unobserved common factors and unknown factor loadings respectively, while the error terms $\sum_{j=1}^{3} \varepsilon_{itj}$ constitute unobserved shocks with zero mean. In order to minimize the distance between synthetic and actual Germany, the countries in the donor pool are weighted by the vectors of weights $\boldsymbol{W_j} = (\omega_2, \dots, \omega_{J+1})'$, such that the linear combinations of weights are positive and equal to one. A second type of vectors $\sum_{j=1}^{3} \mathbf{V}_j$ consist of weights which give more weight to those covariates with higher explanatory power. The Root Mean Squared Prediction Error (RMSPE) is utilized as a goodness of fit measure and the comparison for GDP_{it}^{none} with GDP_{it}^{Influx}, UR_{it}^{none} with UR_{it}^{Influx} and $Wages_{it}^{none}$ with $Wages_{it}^{Influx}$ in the pre- influx periods.

5 Data and Descriptive Statistics

The *World Economic Outlook (October 2019*) data compiled by the *International Monetary Fund* and *OECD* data is utilized in the present study.[7] While GDP and unemployment data for the time interval 2000 to 2019 are drawn from the IMF, wage data is obtained from the OECD for the years 1996 to 2018. GDP in international dollars per capita, adjusted by purchasing power parity is used for 90 countries, while all European member states are omitted since the EU as a whole faced the refugee influx of 2015. As obtainable from Table 1 six covariates are used for the optimization of the fit, i.e. *Government Gross Debt*, *Average Inflation*, *Population Size*, *Current Account Balance* and *GDP per capita*. Table 1 shows the

[7] The detailed presentation is exemplified with GDP, while analogously applicable to unemployment rates and wages.

goodness of fit of synthetic Germany to the actual one for some chosen points in time. As the comparison shows, the fit for GDP per capita is well suited.

Table 1: Descriptive Statistics for Germany and Synthetic Germany

Source: Own Design

	Germany	Synthetic Germany
Government Gross Debt in % of GDP (2016)	68.68667	69.12031
Average Inflation (2013)	1.6333	1.6866
Population Size in Million (2007)	80.995	80.494
Current Account Balance, % of GDP (2004)	4.46	4.39
GDP per capita, PPP (2008)	40572.35	40562.39
GDP per capita, PPP (2012)	44299.7	44302.95

6 ESTIMATION RESULTS

Table 2 presents the values for the country weights ω_2 to ω_{J+1}. Sixty-seven out of ninety countries receive a positive weight while only five countries receive a weight of approximately 0.1 or more. Synthetic Germany consists of 28.3 percent Hong Kong, 24.6 percent Japan, 10.8 percent Aruba, 9.9 percent Bahrain, 9.4 percent United States of America and to small shares of the other countries with positive weights in the donor pool. Figure 1 depicts the trends for purchasing power parity adjusted per-capita GDP for Germany and synthetic Germany. Both curves are entangled into each other between 2000 and 2008 and lie almost completely on each other after 2009. The refugee influx of 2015 does not change this common upward trend. No impact of the 2015 refugee influx on GDP is observable. The pre- influx RMSPE is around 630, which is not small compared to other studies using synthetic control methods, but also not too high. The overall fit can be considered as good. Figure 2 shows the trends in unemployment for Germany and synthetic Germany. The fit is much worse than the one for GDP. However, the curves do not show a negative impact of the refugee influx on overall unemployment rates in Germany. The synthetic unemployment trend lies consistently above the actual trend. Thus, treated Germany performs even better than the synthetic counterfactual. This is in line with the literature. Wages are predicted to fall for some skill groups, but economic performance in general and unemployment rates show rather positive associations with migration. Figure 3 shows the trends for average wages. Both curves follow a common upward trend up to 2013 and diverge increasingly after. The curve for real Germany lies above the synthetic curve, which implies a positive impact of the refugee influx on wages. This finding is not supported by the literature and might be due to data manipulation. The fit is not good enough to draw conclusive results, but one may argue that a demand shock due to increased consumption by hundreds of thousands of people could create new jobs and boost wages for locals. Figure 4 shows the *in-time* placebo test for GDP

and exemplifies the procedure conducted but not displayed for wages and unemployment rates. If the refugee influx of 2015 had an impact on GDP, no other randomly selected year should show any. A divergence of the curves in the post-treatment period is observable when 2010 is selected as the treatment year. This fortifies even more the finding that the refugee influx of 2015 had no impact on GDP.[8]

Using the synthetic control method, it can be concluded that the refugee influx of 2015 does not show any negative impact on GDP, unemployment rates or wage levels. To the contrary, slightly positive impacts can be observed regarding unemployment rates and wage levels, yet no conclusive findings can be drawn due to imprecision in the simulation.

[8] *In-time* and *in-space* placebo tests are conducted for all variables, which further support the findings in the text.

Table 2: Countries in the Donor Pool with Weights for Synthetic Germany
Source: Own Design

Country	Weight	Country	Weight	Country	Weight
Algeria	0.001	Dominican Rep.	0	New Zealand	0.004
Angola	0	Ecuador	0	Nicaragua	0
Antigua and Barbuda	0.001	Egypt	0	Nigeria	0
Argentina	0.001	El Salvador	0.001	Oman	0.003
Armenia	0.001	Equatorial Guinea	0.002	Panama	0.002
Aruba	0.108	Eswatini	0.001	Papua New G.	0.001
Australia	0.005	Fiji	0.001	Paraguay	0.001
Azerbaijan	0.001	Gabon	0.002	Peru	0.001
Bahamas	0.008	Georgia	0.001	Philippines	0.001
Bahrain	0.099	Ghana	0	Qatar	0.018
Bangladesh	0	Grenada	0.002	Russia	0
Barbados	0.001	Guatemala	0.001	Saint Kitts a. N.	0.001
Belize	0.002	Guyana	0.001	Saint Lucia	0.001
Bhutan	0.001	Honduras	0	St.Vin and Gren.	0.005
Bolivia	0.001	Hong Kong SAR	0.283	Seychelles	0.001
Botswana	0.001	India	0	Singapore	0
Brazil	0.001	Indonesia	0	Solomon Islands	0
Cabo Verde	0.002	Jamaica	0	South Africa	0.001
Cameroon	0.001	Japan	0.246	Sri Lanka	0
Canada	0.007	Kazakhstan	0.001	Sudan	0
Caribbean	0	Korea, Republic	0.002	Suriname	0
Chad	0.001	Kuwait	0.033	Taiwan P.of Ch.	0.012
Chile	0.002	Liberia	0	Thailand	0.001
China	0.013	Malaysia	0.002	Trinidad and To.	0.001
Colombia	0.001	Maldives	0.001	Turkmenistan	0.001
Congo	0.001	Mauritania	0.001	United States	0.094
Costa Rica	0.001	Mauritius	0.001	Uruguay	0.001
Cote d'Ivoire	0.001	Mexico	0.001	Uzbekistan	0
Djibouti	0.001	Myanmar	0	Vanuatu	0.001
Dominica	0.002	Namibia	0.001	Vietnam	0

Figure 1: Trends in PPP adjusted per-capita GDP– Germany vs. Synthetic Germany

Source: Own Design

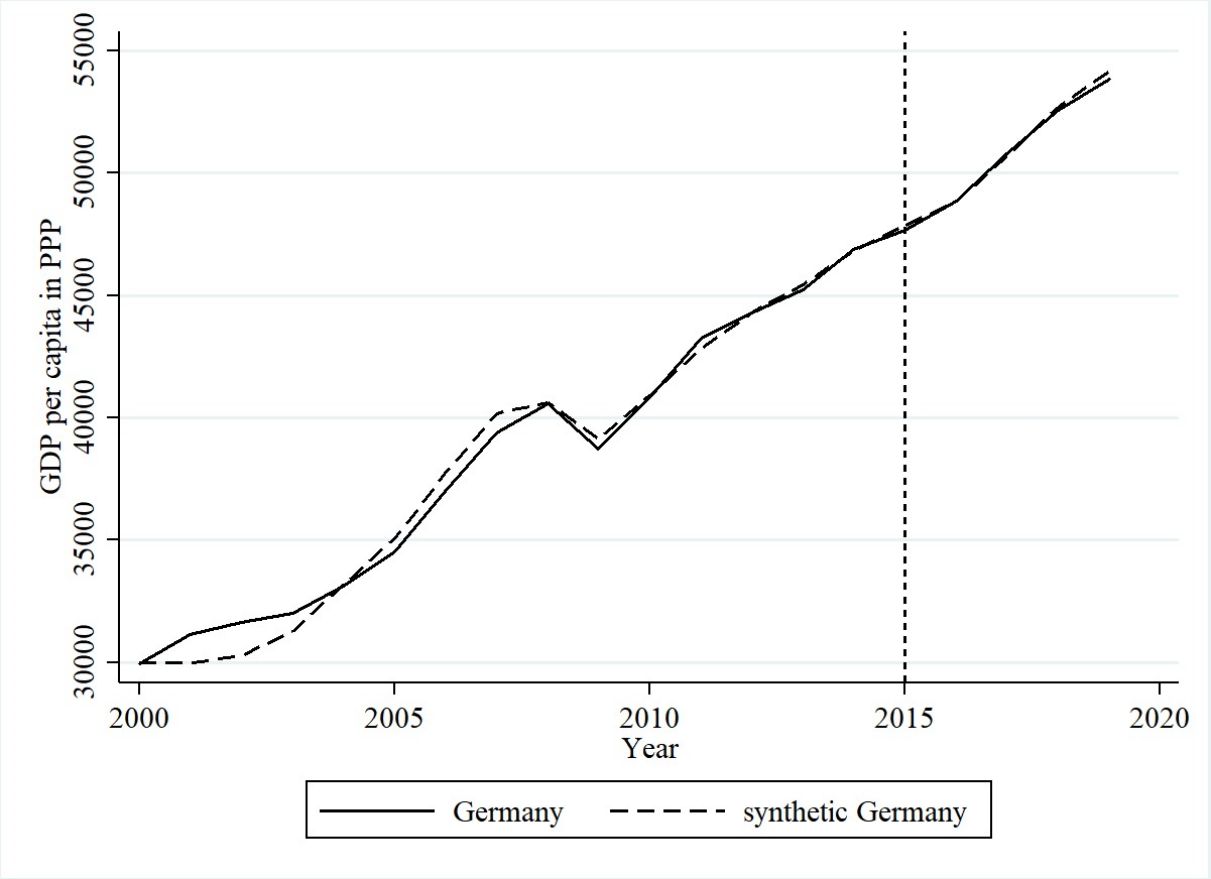


Figure 2: Trends in Unemployment– Germany vs. Synthetic Germany

Source: Own Design

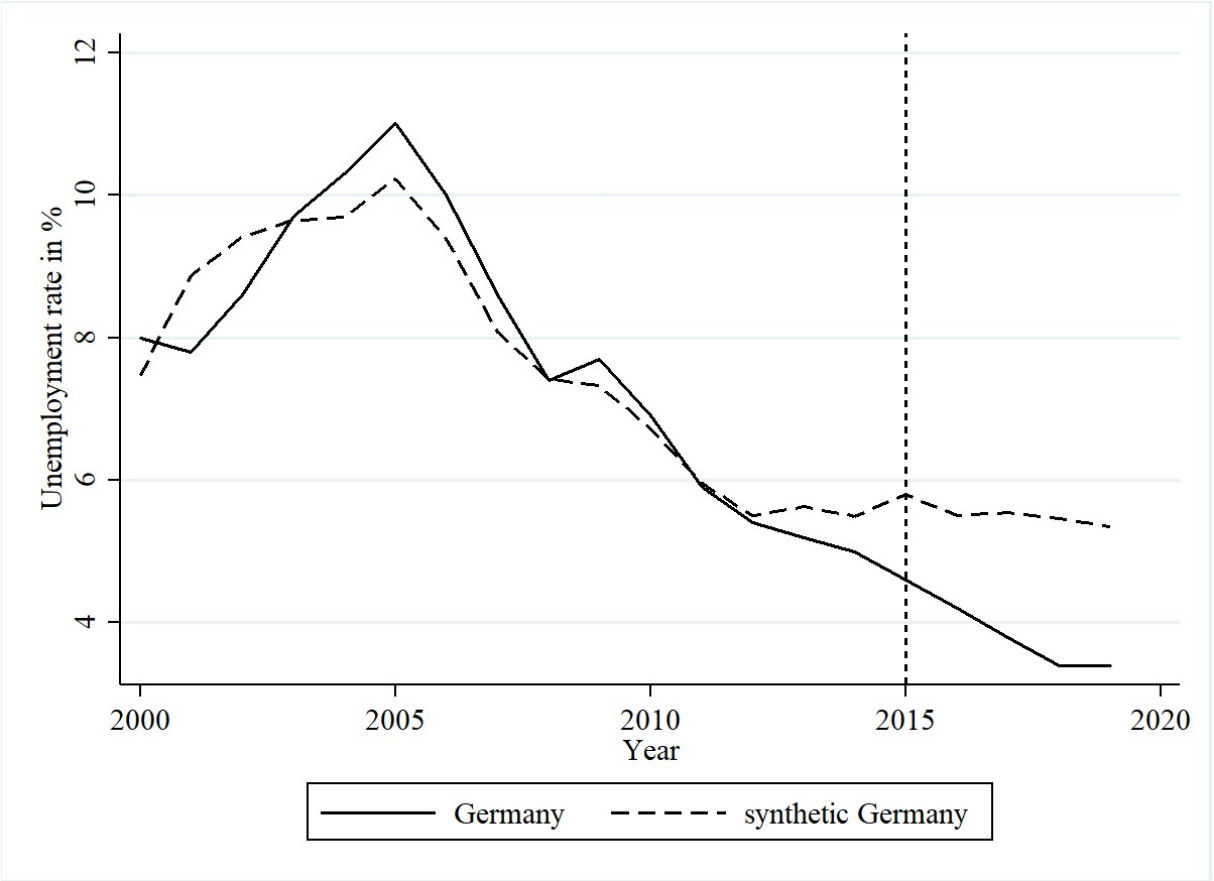


Figure 3: Trends in Average Wages– Germany vs. Synthetic Germany

Source: Own Design

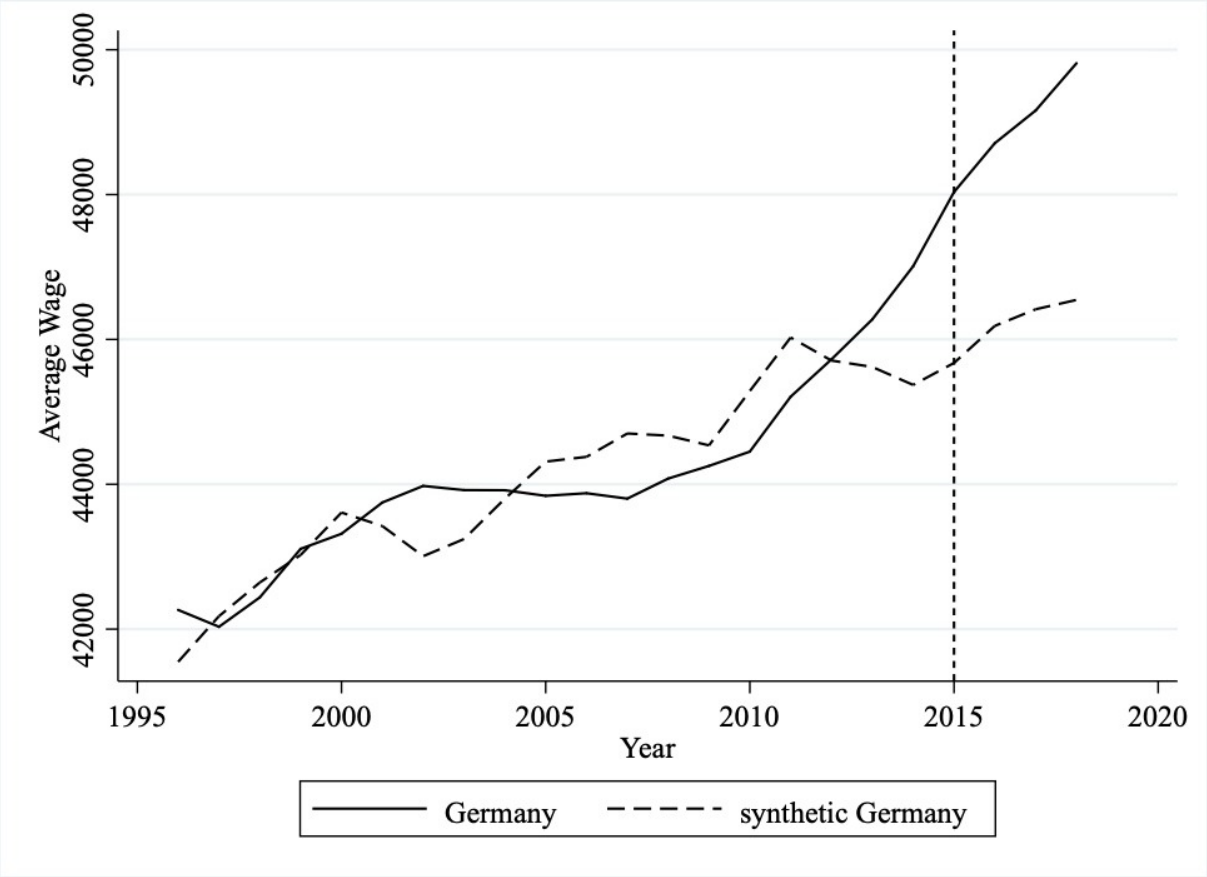
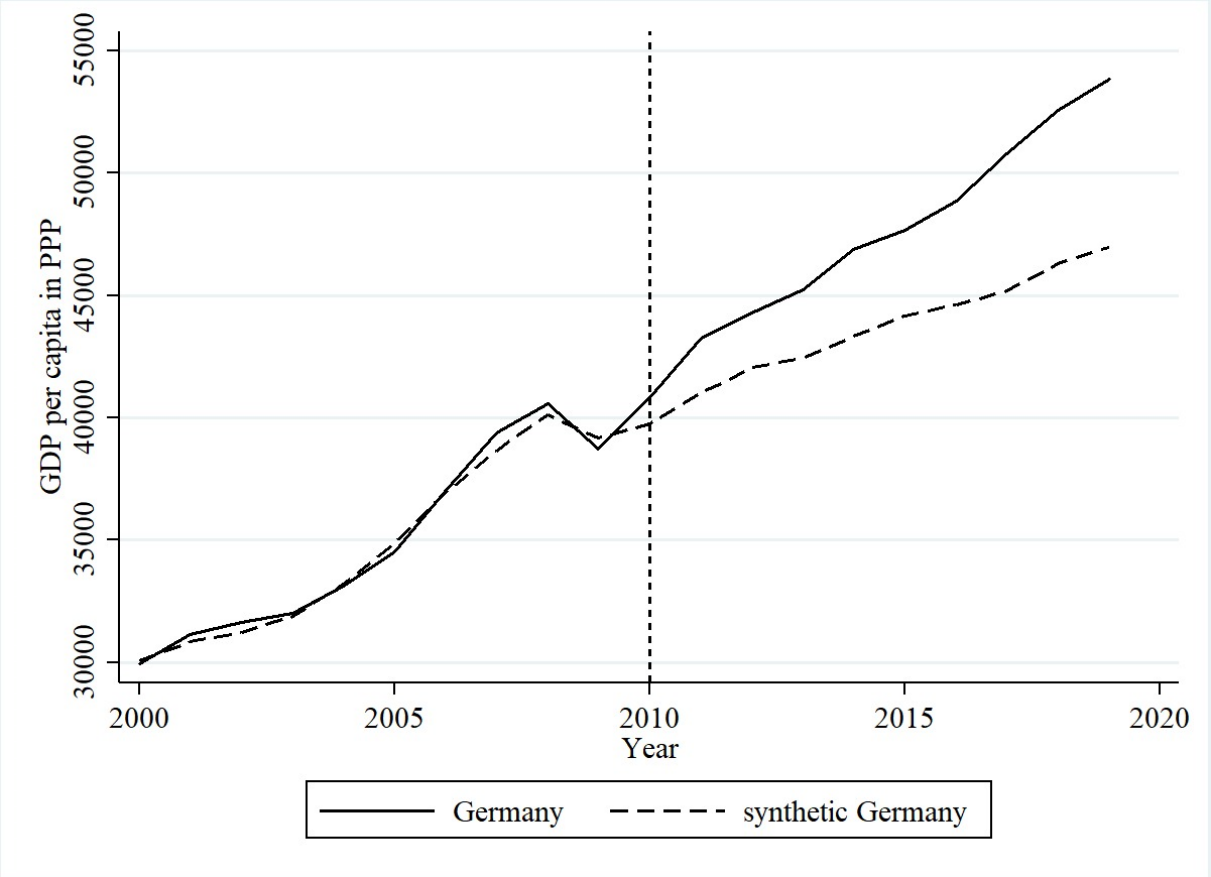


Figure 4: In-Time Placebo 2010 – Trends in per-capita GDP: Germany vs. Synthetic Germany

Source: Own Design



7 DISCUSSION

The present study provides the first investigation of the 2015- refugee influx to Europe, utilizing synthetic control methods. Data on Germany has been used as the country with the largest influx. The quasi-natural experiment nature of the incidence has been exploited. Per-capita GDP, average wages and unemployment rates have been used for the creation of synthetic counterfactual paths, actual German trends have been compared with. No impact of the 2015- refugee influx on German GDP, wages or unemployment rates has been detected, which is in line with the literature.

Probable explanations have been discussed during the paper among which the most important are concerned with the differences between refugees and economic migrants. Compared to economic migrants, refugees do not represent immediate labour supply, due to missing working permits. A large informal sector can help refugees circumvent these hurdles, which is not present in Germany to that magnitude. Refugees' ability to self-select themselves into particular countries or regions is highly constrained. Economic theories of wage optimizing distribution of migrants are not predictive in this setting. The theoretical forecast that migration has a negative impact on per-capita GDP is also not supported.

Previous literature show that overall wages are not sensitive to migration, while wages of particular skill-groups can be, which has not been tested in this paper. Further research utilizing the synthetic control method has to differentiate wages by skill-levels. Micro-level-data is much more advantageous in this sense. Furthermore, future research should investigate the informal sector. The present paper only used formal sector data, while much smaller in Germany than in other countries, refugees could still find employment in low-skill jobs of the informal sector and might create an impact on wages there or even displace workers, which is supported by research from other countries.

The paper discusses important insights for European institutions. Refugee migration does not harm economic growth and is found to be rather beneficial in the economic sense. A highly refugee-repelling or protective EU might not be much necessary for securing living standards of European citizens. Institutional settings such as minimum wages, transferable retirement schemes or Universal Basic Income could be much more beneficial for the protection of European citizens from potential adverse shocks and can make them more resilient.

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