The refugee footprint on politics; a study on refugee influx and voting in Germany

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Abstract

Europe faced a significant refugee crisis in the last decade due to the large influx of refugees from North Africa and the Middle East fleeing war and prosecution. A daunting trend of increasing popularity of right-wing political par and rising hate crime reports is observable across Europe. This paper employs difference-in-differences (DID) regression analysis utilizing the German Socio-Economic Panel (SOEP) to investigate the effect of refugee influx on voting behavior in Germany. In addition, this paper uses nightlight data to test whether economic development moderates the relationship between refugee influx and voting behavior. The results show that voting for immigrant-friendly parties, Christian Democratic Party (CDU) and FDP (Free Democratic Party) improved in districts with substantial refugee influx; however, deteriorated for anti-immigration parties such as Social Democratic Party (SPD) and AfD (Alternative for Germany), after the refugee influx. In addition, the 2SLS results prove that larger cities with greater economic activities are more resistant to liberal parties due to prolonged economic and infrastructure scarcity or challenges. The results of this study are robust to an extensive range of tests, such as using a different measure of refugee severity, falsification tests, and placebo tests. The findings of this study would allow political parties to target and allure voters and help policymakers identify and design social interventions to improve tolerance and acceptance in the community.

1.0 Introduction

The significant movement of refugees and migrants in the last decade has unfolded political debates and economic uncertainties across Europe (Triandafyllidou, 2018). A considerable number of studies focus on the context of individual voting behavior. The current uncertain socioeconomic environment signifies varying conditions in which voters and political parties operate to be crucial, encouraging studies on how voting responds to changing economy (Talving, 2017). An economy's socioeconomic factor is linked to the government's re-election chances, as voters tend to reward existing parties during development times and punish during downturns (Duch and Stevenson, 2008; Kramer, 1971; Lewis-Beck and Stegmaier, 2000). As democracies function through voting, research on retroactive voting is essential in literature. Voters have the strength to maintain better-performing existing political parties in power, incentivizing politicians to work towards a better outcome (Ward, 2020). Angela Merkel, the German chancellor, faced significant criticism for implementing the refugees' open-door policy, which lost her party, The Christian Democratic Union of Germany (CDU), 8.6% votes in the 2017 federal election compared to 2013 (Clarke, 2017). The AfD (Alternative for Germany), a right-wing populist party in Germany, radicalized, shifting from their Eurosceptic approach to operating as a xenophobic party with the refugee influx in 2015. The party enjoyed its highest share of votes, 12%, in the last election, becoming the third-largest political party in Germany (Olsen, 2018). Simultaneously, local and international newspapers reported a significant rise in hate crimes across Germany, claiming a discreet relationship between the two events (Rees, 2019).

The influence of refugee influx on voting behavior can be related to two theoretical frameworks. First, individuals became more tolerant and accepting of the outer group with interaction (Allport, 1954). Second, whether interaction-initiated conflict and discrimination among groups (Stephan & Stephan,

2000). Relating to Tajfel and Turner's (1979) social identity theory, either outcome from interaction might result in the formation of new social groups, influencing voting. The findings shed light on party positioning literature on whether individuals follow elite cues or navigate their support for political parties through policy preferences (Chzhen et al. 2014; Weber and Saris 2015).

This paper investigates whether the refugee influx influences the voting behavior and preference of individuals across 489 districts and urban districts of German and whether and how different economic development across districts plays a role in this relationship. The voting behavior and other personal characteristics are measured using German Socio-Economical Panel (SOEP) data. In contrast, the macro-level variables are from the Statistische Amter Des Bundes Und Der Lander (Statistics Department of Germany). To overcome the barrier of measuring GDP across each of Germany's 489 districts and urban districts, Visible Infrared Imaging Radiometer Suite (VIIRS) Day-Night Band (DNB) data is used to measure economic development. The data sets are merged at the district level with individual longitudinal data of the SOEP for 2014 (before the refugee influx) and 2018 (after the refugee influx), as the significant refugee influx occurred during 2015-16. This data merge enables to observe the changes in voting behavior and preference before and after the refugee influx by comparing with their counterfactuals, assuming no other shocks match the refugee influx data. Therefore, the empirical model captures the effect of refugee influx on voting behavior.

The contribution to the current literature is treble. First, this paper finds the causal relationship between refugee influx and voting and identifies the mechanism underlying the reduced-form relationship. This study is among the few that systemically investigates economic development as a causal mechanism through which refugee influx may affect voting behavior using nightlights as a geographic measure of economic growth, enabling exploiting variations in development during the refugee crisis. Second, a major empirical challenge exists to address the endogeneity related to observables, and unobservables conduct a difference-in-differences (DID) estimation strategy, which allow to comprehend the potential effect of observables and address biases from unobservable using selection on observables, providing casual inference whether voting behavior and preference change after refugee influx. Third, the theoretical contribution of combining and comparing socioeconomic and political partisan theories to provide a better understanding of how German society adapted to the European refugee crisis; in terms of voting.

The results show that voting in districts with refugee influx improved for political parties inclined towards accepting immigrants and refugees during the 2015 European refugee crisis, Christian Democratic Union (CDU), and Free Democratic Party (FDP). In contrast, parties strict or against immigration, Social Democratic Party (SPD)., and the right-wing political party Alternative for Germany (AfD) lost votes. The improvement in the acceptance of outer groups (i.e., refugees) supports Allport's (1954) social integration theory, where interaction improves relationships and reduces conflict. This finding aligns with the understanding that interaction with outer groups promotes tolerance and resolves actual prejudice. Furthermore, the 2SLS analysis shows that areas with greater economic development harms voting for pro-immigration parties; while reducing support for anti-immigration political parties. The analysis results

are robust as falsification, placebo, randomization, and addressing unobservable bias tests show consistency.

The paper is in this order. Section 2 of the paper gives an explicit background to the growing support of right-wing political parties, along with brief background about the political parties and refugee scenario in Germany. Section 3 reviewed the theoretical and empirical literature on interaction with outer groups and political party positioning. Section 4 discusses the methods and methodology, explaining how the data was collected and the statistical framework developed for this study. Section 5 discusses the results and analysis and the validity of our framework and analysis. Lastly, the conclusions and remarks are in section 6.

2.0 Background

2.1 Surge in support of right-wing political parties in Europe

The European refugee crisis has resulted in right-wing parties across Europe gaining popularity. In 2019, the right-wing party, Vox, doubled its seats to 25 in Spain, rising to third place. The party aims to unite the Spanish state and promises to deport illegal immigrants from Spain (Vamp, 2020). In 2018, Sweden Democrats (SD), a nationalist right-wing populist party, performed much better, winning 18% of the votes. The right-wing Populist Party is categorized as the origin of neo-Nazism and stands against multiculturalism, promoting strict immigration controls (Elgenius and Rydgren, 2017). Simultaneously during the same time, Hungarian Prime Minister Viktor Orban, who boasts himself as the defender of Hungary and Europe from Muslim immigrants, won his third term with a triumph (Lamor and Varga, 2017). Italy's League leader, Matteo Salvini, achieved incredible popularity after the financial crisis and migrant influx from North Africa and the Middle East in 2016. While serving as interior minister, Matteo passed an anti-immigration policy that barred humanitarian rescue ships from ports in Italy (Bertuzzi, Giovannini, and Seddone, 2018). The far-right political party, Alternative for Germany (AfD), became Germany's largest opposition party in 2017 by entering parliament with 12.6% of the vote. The increase in popularity is associated with millions of undocumented migrants being allowed to enter Germany. The party started as anti-euro and initially pushed for strict anti-immigration policies. It created hostility towards Islam and broke anti-Nazi taboos (Lees, 2018). The concurrent rise of power of right-wing parties and hate crimes motivated by racism and xenophobia are on the rise (Gündüz, 2010), making this study provident.

2.2 Political parties in Germany

Germany has sixteen states and 489 districts, and urban districts. Every four years, the people of Germany vote in the parliamentary election for representatives from their electoral districts and political parties such as CDU, SPD, FDP, AfD, and others. In the Bundestag, the national assembly in Berlin, there are 598 seats which might extend to additional seats for parties to receive proportional seats to the votes they received in the election. Every five years, the federal and state reps elect the president, who appoints the chancellor, elected by local state elections. The appointed chancellor then is voted on by the

Bundestag, the national assembly of Germany. The chancellor is responsible for the policy guidelines, picking a cabinet, and holding the coalition and parliament together to make policies and proposals pass. The four major political parties are the incumbent, formerly conservative but currently open to immigration, CDU (Christian Democratic Union of Germany); a liberal-conservative political party; found in 1948 is a liberal political party, FDP (Free Democratic Party); the oldest party in Germany and one of the earliest Marxist-influenced parties, SPD (Social Democratic Party of Germany; the far right-wing political party who oppose the European Union and immigration of outer groups., AfD (Alternative for Germany). For this study, we have analyzed the voting behavior and preference of individuals for four major political parties, Christian Democratic Union (CDU), Free Democratic Party (FDP), Social Democratic Party (SPD), and Alternative for Germany (AfD), as they make up more than 80% of the seats in parliament with approximately 80% of the votes in the federal election in 2013 and 2017.

2.3 Refugees crisis in Germany

The war in Syria has created a large influx of refugees, approximately 5.6 million, to seek shelter in Europe by crossing the Mediterranean Sea or through the land from Southeast Europe. The European refugee crisis has worsened with the surge in Islamic State (ISIS) attacks in Northern Iraq, further creating 3 million refugees, among which 260 thousand were forced to flee Iraq in 2014. In addition, there has been a moderate inflow of refugees from Afghanistan, Kosovo, and Albania. Among countries in the EU, Germany received the highest number of asylum applications, causing political party partisans and preferences in Germany (Otto and Steinhardt, 2017). The figure below shows a sudden increase in asylum application in 2015-16.

In Germany, the refugees (asylum seekers) are spread across states using a national system called EASY. The quota-based distribution, Königsteiner key. The calculation is done from tax revenue and population (2/3 comes from tax revenues and 1/3 from the population.) Thus, each state in Germany receives asylum seekers according to its economic capacity and population density. The states then assign asylum seekers to counties following a similar quota system. The counties then allocate asylum seekers to municipalities across districts with no 'one' definite system. The permission to reside is restricted to the district where the reception facility is located. At maximum, during the first six months of the asylum application, the asylum seeker must remain in the initial reception center, where daily assistance is provided. The asylum seeker must find collective housing spread across the federal region and, if required, are provided with medical care. They are allowed to work after moving from their initial reception centers but need a work permit from the Alien's authority. However, after being granted asylum or 'refugee' status, they can work without requiring any other permission from governmental bodies (UNHCR, 2019). Refugees are inclined to remain in their designated municipality rather than moving to a different district, because, along with refugees being obliged to remain in the assigned area during the process, they are also provided basic necessities (Gehrsitz and Ungerer, 2022). Lastly, refugees who migrated to Germany from 2016 onwards, are restricted to the assigned area for two years minimum due to the Refugee Integration Act 2016.

The Federal Office for Migration and Refugees (BAMF) coordinates the allocation of refugees along with the states and municipalities. In current literature, certain scholars have emphasized that housing or job availability might be evaluation criteria for allocating refugees to municipalities. However, the allocation of refugees has been criticized as being very random, causing ongoing pre-issues such as housing shortage, inflation, and unemployment to deteriorate further (Gehrsitz and Ungerer, 2022). The asylum seeker cannot self-select their location of residence, nor are their preferences taken into consideration during their allocation procedure. In addition, according to the German Migration department, officials responsible for assigning the asylum seeker have no prior background information on the applicant to avoid bias during the allocation procedure. Thus, even if certain criteria influence the district-level allocation of refugees, the refugees have minimum control in deciding their location of residence, making the allocation random. The allocation of refugees to municipalities being random and the restriction of voluntary movement of refugees from district to district justifies the use of the difference in differences (DID) regression analysis for our study.

3.0 Literature review

This section provides a thorough analysis of the literature. The review thoroughly explains how interaction among individuals influences their attitude towards immigration and refugees, how they decide to support chosen political parties, the reasons behind the popularity of right-wing parties across Europe, and existent studies on the economic and socioeconomic effect of the refugee influx.

3.1 Theoretical underpinning

3.1.1 Interaction and prejudice

The acceptance or disapproval of refugees residing alongside locals is admissible to the interaction between the two groups. Gordon Allport (1955) proposed his hypothesis that social contact between social groups is ample for reducing intergroup prejudice, now known as the social interaction theory. He discussed this phenomenon in his book '*The Nature of Prejudice*.' He weighed how social interaction among groups can be fruitful when certain conditions meet, for instance, equal status, intergroup cooperation, common goals, and support by social and institutional authorities. Since the 19th century, there has been emerging literature on his hypothesis by theorists. Lett (1945) had a similar understanding and believed interracial contact results in rapport and consideration. This group thought refugee influx would promote tolerance and reduce prejudice, making individuals more welcoming towards outer groups such as refugees or immigrants.

On the contrary, social scientists such as William Graham Sumner (1906) and Baker (1934) claimed that intergroup contact assured conflict, fear, and hostility, claiming that majority groups find themselves to be superior and hate and conflict were natural and inevitable (Curtis, 1978). Stephan and Stephan's (2000) integrated threat theory introduced realistic and symbolic threats associated with outer groups. These threats concerning the outer group were understood to exploit the in-group and intergroup anxiety and

arise from interaction with outer groups. Therefore, the refugee influx would make locals more unwelcoming and prejudiced towards refugees and immigration.

Relating to Tajfel and Turner's (1979) social identity theory, individuals' self-concepts are built on their membership in social groups such as nationalities, occupational groups, gender, and other characteristics. Social identities influence people's attitudes and behaviors regarding their in-groups and outer groups. They tend to differ in strength depending on how strongly they believe the membership in a particular group to be central to self-concept and attachment to emotional ties. According to theory, affiliation promotes self-esteem and sustains social identity. For instance, within-group assimilation is the pressure to accept the in-group's norms and existing intergroup bias and favoritism, such as evaluating one's in-group relative to the outgroup and negatively evaluating the outer group. Therefore, interaction or association with the refugee community and groups might influence voting.

3.1.2 Party positioning

In sociology literature, two major perspectives exist on how individuals react to party positioning on an issue. Elite cues, where citizens depend on trusted elites to form opinions regarding issues (Berinsky 2007; Zaller 1992); and policy preferences to prejudiced attitudes, where individuals' assessment of policies tend to impact partisan attitudes by providing a criterion to evaluate partisan actors (Downs 1957; Rabinowitz and Macdonald 1989). Adapting both perspectives, researchers deduced that the 'importance' of the issue determines the phenomena individuals follow. Individuals weighing highly on a particular topic would drive the issue-based evaluation of political actors, whereas cue-taking dominates if the problem is inessential for individuals (Chzhen et al., 2014; Weber and Saris, 2015). Therefore, if individuals prioritize the refugee crisis, they will follow political parties with their policy preferences rather than supporting 'elite cues'.

3.2 Empirical studies

3.2.1 Interaction and prejudice

The empirical studies initiated from social contact theory tend to support opposing views regarding social contact theory. Sims and Patrick's (1936) study on intergroup contact found that northern white students became more racist when black and white students were immersed in concentrated white University of Alabama. In contrast, studies by Brophy (1946) and Kephart (2018) showed reduced intergroup tolerance. For instance, with more voyages white seamen took with black seamen, the better their improvement in attitudes towards each other, and fewer objections were found to exist to white police officers working with black officers when put to work together. Later, Williams (1947) proposed specific requirements for intergroup contact to affect prejudice positively; both groups had to share status, interests, and tasks; the situation promotes personal connection, individuals do not fit the stereotypical conceptions of their group members, and activities cut across group lines. From the empirical studies, it can be deduced that interaction can improve or worsen acceptance and prejudice among individuals depending on the context.

3.2.2 Political party partisan and identification

The literature on political party partisans and identification allow to learn how individuals' voting behavior is influenced after the refugee influx. The traditional view of party identification being developed at an early age is questioned with empirical evidence. Franklin (1984) investigated the effects of parental socialization and political preferences on the party identification of young adults. The results showed that party identification is not fixed in childhood, and preferences for political parties change. Gerber and Green (1998) found that party partisans tend not to imply through time. They found that party performance over time tends to influence party affiliations with more access to general information. Elite polarization, where parties are more transparent about their decision or stance on the issue, promotes more consistent attitudes among voters in a modern democracy (Levendusky, 2009). Using five survey experiments, Kertzer and Zeitzoff (2017) investigated whether cues from social peers are more important than political cues. Their results show that social contexts that integrate with general orientations towards foreign policy shape responses to the world around them.

Similarly, Guisinger and Saunders (2017) used nine survey experiments across local and global issues and found that issue context matters in the effectiveness of elite clues. For instance, mass opinion on the subject tends to matter, where the beliefs align with expert opinion or the degree of partisan political plays a significant role. At the same time, voters' personality traits influence biased attitudes and voting behavior (Schoen and Schumann, 2007). The authors tested the hypothesis using survey data in Germany. For instance, the openness of individuals inclines them to support social liberalism; low scores on conscientiousness and high levels of agreeableness promote liking or voting for economic or social liberalism. Furthermore, high levels of neuroticism promote support for parties against material or cultural challenges. Thus, according to the literature, individual characteristics and their perception of the issue's importance influence how individuals vote for political parties.

3.2.3 Refugee influx and voting across Europe

The effect of refugee influx on nationalism and anti-immigration attitudes differs across Europe. The attitudes towards left- and right-wing citizens became more polarized due to the refugee crisis, with the effect being more significant for countries with higher asylum applications (Brug and Harteveld, 2021). The authors found no significant differences in Central Eastern Europe. Whereas, across Europe, there was no significant effect on national identity along with the refugee crisis; instead, Greece, Italy, and Spain were impacted mainly due to the refugee influx. Italy had one of the most significant influx of refugees among the European nations. Chou et al. (2018) studied the effect of immigration on Italians' political preferences. They found municipalities with more excellent immigrant arrivals are more likely to vote for a coalition of center-right, which lobby for tighter policies against refugees. Similar voting behavior was found in Upper Austria as far-right parties gained significant support in municipalities with greater asylum numbers (Steinmayr, 2017). In the Greek islands, the arrival of refugees significantly affected the behavior of locals (Vasialakis, 2018). The regression results showed support for the right-wing party Golden Dawn; for instance, a 1% increase in the share the refugee is associated with a 5%

increase in votes for Golden Dawn. In a comparatively lower-income country, Turkey, no significant effect was found on voting behavior among locals (Altindag and Kaushal, 2017). The authors studied an influx of around three million Syrian refugees on voting behavior in Turkey using a difference-in-differences approach, comparing political results in geographically low- and high-density refugee presence before and after the Syrian civil war. The endogeneity of refugee location was dealt with using an instrumental variable approach of historical dispersion of Arabic speakers, taking advantage of the fact that Syrians are more likely to settle in districts with high Arabic-speaking host populations. Gehrsitz and Ungerer (2016) used refugee administrative data across German countries to find the impact of refugee influx on the labor market, crime, and voting behavior. The results showed no effect on local employment; however, crime rates increased at a low margin.

In contrast, the finding on support for right-wing parties was contradictory. The right-wing parties increased in popularity; however, at the micro-level, the effect was the opposite. The political parties risk losing their voters when striving to gain right-wing voters by imposing or promoting restrictive immigration policies (Chou et al., 2018). Mader and Shoen (2019) used panel data and analyzed how German political parties reacted to the refugee influx at Europe's borders in 2015/16. The result indicated that political parties taking an anti-immigration stance gained a new group of voters; but lost existing voters too. We can observe a joint movement of individuals towards right-wing parties and parties drawing sides based on the refugee crisis; thus, this refugee crisis is considered a critical juncture in transforming party competition in Germany and Europe.

3.2.4 The support and resistance to immigration and refugee influx

Social scientists emphasized how anti-immigration attitudes tend to develop from either economic or socio-psychological factors. The context-framing concerns regarding immigration are understood to associate different types of immigration with threats (Hellwig and Sinno, 2017). The authors conducted a survey in Britain which showed locals associated security threats with Muslim immigrants, whereas economic threats with Eastern European immigrants. The British associated crime with East Europeans more than Muslim immigrants and vice versa for cultural threats. Facchini and Mayda (2006) investigated the lack of acceptance of skilled immigrant workers in the labor market through existent demand. The authors used two measures, the labor market and the welfare state. The results exhibited that more educated individuals were less likely to favor skilled immigration, while more affluent individuals showed similar behavior under the welfare model. Thus, the authors concluded that avoidance of labor market competition by skilled natives in host countries might be influencing protective policies toward immigration. In the context of Western Europe, and Switzerland, the decision of municipalities using referendums to decide on citizen applications of foreign residents tends to vary drastically on attributes of foreigners. The country of origin had tremendous success compared to other characteristics, language skills, integration status, and economic credentials. For instance, 'no' votes for naturalization were approximately 40% higher for applicants from Yugoslavia and Turkey than in wealthier northern and western Europe (Hainmueller and Hangartner, 2013). Similarly, Clayton, Ferwerda,

and Horiuchi (2019) studied the acceptance preferences of foreigners in France. They compared participants across different subgroups and found that social contact with refugees significantly influenced admission preferences. French natives with little or no interactions with immigrants are less favorable to immigrants from non-western countries and more favorable towards western immigrants. In addition, the natives with social interaction with immigrants tend to overlook nationality as a criterion for immigrant admission. Education also decreases nationalism and xenophobia. Hjerm (2001) used data from International Social Survey Programme to empirically compare ten countries to assess the relationship between education and attitude towards foreigners. The results showed that though the education system differed across countries, the extent of nationalist sentiment and xenophobia decreased with higher education levels in all the countries examined (Hjerm, 2001). Chang and Kang (2018), using World Value Survey (WVS), found that trust in foreigners promotes support for immigration. Still, the acceptance was greater with factors such as generalized trust, economic incentives, or socio-psychological motives. In addition, the size of the immigrant population or residential proximity to immigration centres was found to navigate the anti-immigrant attitudes of locals (Hopkins, 2010; Fetzer, 2000). The conception of immigration is related to economic threat through either competition for jobs or fiscal worry for providing welfare is common in literature. Herizmann and Huth (2021) investigated the extent to which economic threats are connected to immigration. Their results indicate that dynamic short-term developments of the economy and migration are of greater relevance while perceiving refugees as economic threats. In comparison, the country's economic performance and unemployment are the primary sources of considering immigration as an economic threat. If the migration qualification structure matches the native population, the changes in GDP or consumption are negligible (Stahler, 2017). The role of media in portraying immigration as an economic threat is also significant though less dominant than referring to immigration as a security threat (Kovář, 2020).

3.3 Research gap, questions, and objectives

The growing literature on immigration and refugees has focused on the labor market and socioeconomic factors imminent with the refugee influx. The majority of refugee studies investigating the influence of refugee influx are experimental or macro comparisons across regions. The DID specification allows isolating of the effect of the refugee influx while controlling for other covariates that might influence the relationship across a large individual-level sample across 489 districts in Germany. From a theoretical perspective, in Allport's (1954) social interaction theory, interaction with outer groups such as refugees are expected to improve the relationship and tolerance of individuals towards them, adversely Stephan and Stephan's (2000) social threat theory proposes the vice versa effect, claiming interaction promotes conflict with outer groups. Relating to Tajfel and Turner's (1979) social identity theory, either improvement or harm in their relationship with the refugee community might make individuals identify or not identify themselves with the refugee group, influencing voting. The findings of this paper enrich the understanding of party positioning literature on whether individuals follow elite cues or navigate their support for political parties through policy preferences. This paper investigates whether the refugee influx impacts individuals' voting behavior and preference in Germany, and whether economic development plays a role in this relationship. The research questions developed for this study are,

Q1) Does individuals' voting behavior change due to transitory refugee fluctuations?

Q2) Whether economic development play a moderating role between refugee influx and the voting behavior of locals?

This study investigates the influence of refugee influx on individuals' voting behavior and tests the moderating role of economic development in this relationship. First, finding a causal relationship between refugee influx and voting behavior and systematically examining how economic development can act as a moderator between the studied variables. Second, addressing observable and unobservable endogeneities. The difference-in-differences (DID) estimation strategy captures the potential effect by addressing biases using selection on observables, suitable to provide causal inference on whether refugee influx influences individuals. Third, the theoretical contribution of integrating several socio-economic and political partisan theories to understand how the German society adapted to intervention, refugee influx. The study findings will also help political parties acknowledge voters and captivate them towards their parties a. They will also allow policymakers to recognize the local attitude and perception towards immigration and refugee influx, allowing the development of refugee integration policies.

4.0 Methods and Methodology

4.1 Data

To study the influence of the refugee influx on voting behavior and what role economic development plays in their relationship, three different data sets are merged. First, to capture the individual characteristics and location of the individuals' voting behavior, three subsets of SOEP data in the SOEP remote server are combined. The German Socio-Economic Panel (SOEP) captures individuals' voting behavior. It is a longitudinal data set survey of around 11,000 private households across Germany from 1984 to 2019 and Eastern German states from 1990 to 2019. The variables in the dataset include household composition, employment information, occupation and income, health, and satisfaction indicators, along with attitude and personality measures. Second, the refugee numbers, local population, and other statistical information from Statistische Amter Des Bundes Und Der Lander (Statistics Department of Germany) are used. Third, to capture the economic development across 489 districts and urban districts in Germany, VIIRS DNB nightlights data is used.

To investigate the causal impact of the 2015-16 refugee influx, using a difference in differences (DID), a pre-and post-period is required. The immediate federal elections preceding the refugee influx occurred in 2013, whereas the subsequent 2017. The surveys capturing the voting behavior of 2013 and 2017, were captured in the years 2014 and 2018, and therefore chosen for analysis. Due to at least a certain number of refugees residing across each district in Germany, treatment and control groups are determined by the proportions of the district refugee share, as in current literature. In 2018, the districts with the lowest quantile of refugee numbers were considered as control, with less than 1% of refugees in the population, whereas the other districts as treated.

4.1.1 Refugee numbers and refugee exposure measure

The refugee number and the local population are taken from the statistics department of Germany. The refugee exposure measure is calculated by dividing the number of refugees in the total population for each district. In other words, the refugee exposure measure is the share of refugees in the total population (Altindag and Kaushal, 2017).

Refugee share = Number of refugees / Total population

4.1.2 Nightlights data as a measure of economic development

The global daily measurements of nocturnal visible and near-infrared (NIR) light is measured using the Day-Night Band (DNB) sensor of the Suomi National Polar-orbiting Partnership (SNPP) Visible Infrared Imaging Radiometer Suite (VIIRS). The VIIRS DNB's ultra-sensitivity in lowlight conditions allows substantial sensor resolution and calibration improvements compared to Defence Meteorological Satellite Program/Operational Linescan System's (DMSP/OLS) night-time light image products, allowing VIIRS DNB products to monitor better both the magnitude and signature of night-time phenomena and anthropogenic sources of light emissions. The area of less than one square kilometer is represented by each pixel of the satellite image. The digital number we find from the dataset measures the brightness at night. A higher number of pixels would mean the brighter the spot. The pixels are aggregated by districts, which act as an indicator for economic activities across districts, thus a barometer of economic development. The use of nightlights as a measure of economic activity is relevant due to their strong correlation with economic activities. For instance, nightlights have been noticed to light up over time, and more pixels light up for growing economies, compared to conflict areas which show pixels to lose light. In addition, with improvements in development or urbanization and infrastructure modernization, more intense light is registered by satellite sensors. Nightlights and Gross Domestic Product (GDP), the most popular measure of economic development, show a significant positive relationship. For instance, rich countries show brighter nightlights compared to less developed countries, and Nordic countries show the brightest spots globally on per capita (Avetisyan, 2020; Fu, Zarro, Pasquale and Ullo, 2021; Hu and Yao, 2019; Skoufias, Strobl, and Tveit, 2021). The current literature has used night light data as a proxy to measure economic development. Henderson, Storeygard, and Weil (2009) used nightlights in their statistical framework to augment income growth measures under the assumption that measurement error using night light as an indicator of income is uncorrelated with measurement error in national income accounts. Such applications stipulate a research program in which "empirical growth" are not required to be synonymous with "national income accounts."

4.2 Identification and estimation framework

This detailed description of the estimated framework is explained in this section. A quasi-experiment approach is adopted by running a generalized DID strategy to estimate the causal effect of the 2015-16 refugee influx on voting behavior. The DID model has the following form,

$$y_{idt} = a_d + \beta_1 Refugees_d + B_2\,Post_t + B_3(Refugees_d \times Post_t) + X_{idt} + \varepsilon_{idt} \quad (1)$$

In this model, y_{idt} represents the binary indicator of individual i's support for political parties (CDU, FDP, SPD, and AfD), who is living in district d, and interviews in time t. It is included in the model to control for common trends and shocks to voting that may correlate with factors that vary *permanently* by division and *systemically* change over time. *Refugees are* the total number of refugees in district d if it exceeds a minimum refugee share of 1%. *Post* is a dummy variable for the post-influx period that takes the value of 1 if observations are of the SOEP year 2018 (after 2015) and 0 otherwise. Coefficient B3 estimates the average treatment effect in Eq. (1). We restrict our estimation model by controlling Xi as a vector of individual covariates, including the participant's age, sex, and relationship status. $_{idt}$ is the idiosyncratic error term that captures time-varying unobserved heterogeneity.

To study whether there is a third variable economic development, Zdt plays a role in the relationship between refugee influx and voting behavior; two-stage least squares (2SLS) are run to find the effect of economic development on the change in voting behavior. The measure of economic growth is done using VIIRS nightlights data. The first stage of regression is as follows, Eq. (2).

$$Economic\ development_{dt} = a_d + \beta_1 Refugees_d + B_2 Post_t + X_{idt} + \varepsilon_{idt}$$

(2)

And the second stage regression is shown below in Eq. (3).

$$y_{dt} = a_d + B_2 Post_t + B_3(Economic development_d \times Post_t) + X_{idt} + \varepsilon_{idt}$$

(3)

5.0 Result and analysis

5.1 Descriptive analysis

Table 1 illustrates the sample characteristics of the sample used in this study. From the descriptive statistics shown, on average 10% of individuals in the sample voted for CDU. The sample consists of an equal share of men and women, with an average age of 39.85 years.

Table 1
Sample characteristics

	Observations	Mean	Std deviations	Min	Max
Dependent variables					
CDU	10,646	0.10	0.16	0	1
FDP	2,037	0.02	0.15	0	1
SPD	9,170	0.08	0.07	0	1
AfD	1,938	0.002	0.03	0	1
Independent variables					
Female	57,702	0.51	0.50	0	1
Age (years)	113,521	39.85	22.53	2	111
Partner (yes/no)	114,086	0.50	0.50	0	1

Note: The table shows descriptive statistics for the SOEP sample used in this study. The observations are from years 2014 and 2018.

A linear relationship between attitudes toward refugees and refugee share in the population is visible from column 1 of Table 2. A significant positive correlation indicates increased refugee share and positive attitude toward refugees moving in tandem; an increase might increase another in the same direction. Followed by the percentage of individuals with positive attitudes towards refugees who voted for political parties; CDU (column 2), FDP (column 3), SPD (column 4), and AfD (column 5) are shown.

Table 2
Correlation and percentage of voters with positive attitude towards refugees

	Voted for political party in the federal election				
	Refugee share (1)	Incumbent party CDU (2)	FDP (3)	SPD (4)	Right wing AfD (5)
Influence of refugees on the economy to be good	0.21*	0.29	0.25	0.30	0.13
Influence of refugees on cultural life to be positive	0.20*	0.28	0.24	0.29	0.10
Influence of refugees in Germany as a place to live to improve	0.20*	0.26	0.22	0.28	0.06
Refugee influx more opportunity than risk (short term)	0.15*	0.12	0.09	0.14	0.03
Refugee influx more opportunity than risk (long term)	0.20*	0.26	0.21	0.27	0.07

Note: The correlation of attitude towards refugees with refugee share (column 1) followed by individuals who have voted for CDU (column 2), FDP (column 3)), SPD (column 4), and AfD (column 4) are shown in the table.

Among individuals who agree that refugees improve the economy, 29% voted for CDU, and only 13% voted for AfD in the federal election (see column 1 of Table 2). Similar trend is observed across the welcoming attitudes and voting behavior of individuals. Individuals with a positive or welcoming attitude towards refugees favor liberal parties compared to right-wing parties. The precondition of reliability of the DID regression analysis is analyzed. The sample characteristics between the treatment and control groups must be similar before the treatment period. Table 3 shows whether statistical differences exist between the control and treatment groups before the refugee influx.

Table 3
Assessing the treatment and control groups pre-treatment period.

	Treatment (1)	Control (2)	Difference (3)	Standard error (4)
Demographic characteristics				
Female (gender)	0.51	0.54	0.03	0.01
Age (years)	36.80	55.50	18.61	0.20
Partner (yes)	0.40	0.77	0.38	0.004
Voting behavior				
Voted for CDU	0.06	0.25	0.19	0.003
Voted for SPD	0.06	0.18	0.12	0.002
Voted for FDP	0.01	0.06	0.06	0.001
Voted for AfD	0.01	0.02	0.01	0.001

Note: The average characteristics of the treatment and control, and the differences before the refugee influx in 2015 are shown in column 3, followed by the Standard Error (S.E) in column 4.

The use of the difference in differences (DID) is well-founded with the assumption that the treatment and control samples have similar characteristics before the pre-treatment period (i.e., before the refugee influx in 2015-16). The critical finding from Table 3 is that the voting behavior across the treatment and control sample (districts) was not significantly different from each other before the refugee influx.

5.2 Benchmark analysis

The benchmark analysis results, along with the effect of the moderator, and economic development on the relationship between refugee influx and voting behavior, are discussed in this section.

5.2.1 The effect of refugee influx on voting behavior

The aim of this study is to test whether short-term shock and refugee influx influence individuals' voting behavior. Therefore, a quasi-experimental study is conducted, using DID regression analysis. Treatment groups, districts above 1% refugee share in population is compared with districts below 1% refugee share in population. Table 4 reports the influence of the 2015 refugee influx on voting behavior. Each column shows a separate regression and presents corresponding estimates. For instance, column (1) shows the results for individuals who have voted for the Christian Democratic Party (CDU), column (2) Free Democratic Party (FDP), column (3) Social Democratic Party of Germany (SPD), and column (4) Alternative for Germany (AfD). The DID estimates illustrate the net effect of the refugee influx, which assimilates the channelling result of economic development, which we address in later sections.

Table 4
The effect of refugee influx on voting behavior

	Dependent variable: Voted in the German federal election			
	Incumbent party CDU (1)	FDP (2)	SPD (3)	Right wing AfD (4)
Refugee share	-4.88*** (0.64)	-2.81** (0.43)	3.76** (0.68)	2.22 (0.33)
Post influx	-0.02*** (0.01)	-0.01 (0.001)	-0.03*** (0.01)	0.08*** (0.01)
Refugee share * Post influx	**2.42*** (0.56)**	**1.58*** (0.40)**	**-1.97*** (0.58)**	**-2.88*** (0.32)**
Gender (Female)	0.02*** (0.004)	-0.01*** (0.000.1)	-0.01** (0.004)	-0.02*** (0.001)
Age (years)	0.003*** (0.00001)	0.001*** (0.0001)	0.002*** (0.0001)	-0.0002*** (0.00002)
Partner (yes)	0.05*** (0.01)	0.01*** (0.002)	0.01*** (0.01)	0.01*** (0.002)
State fixed effects	Yes	Yes	Yes	Yes
Observations	39,646	39,646	39,646	39,646
R-squared	0.07	0.27	0.03	0.03

Note. This table shows the results of the difference-in-differences analysis. The observations are at the individual-level unit. The dependent variable measures whether the individual voted for CDU (column 1), FDP (column 2), SPD (column 3), AfD (column 4). Measured using SOEP question, which political party you have voted for in the previous federal election. Dummy variables are created of individuals who voted for (1) CDU (2) FDP (3) SPD (4) AfD. In parentheses are the robust standard errors. ∗Significant at 10% level; ∗∗significant at 5% level; ∗∗∗significant at 1% level.

From the results, it can be observed that the refugee influx in Germany has significantly influenced voting behavior in the federal election. The significant positive coefficients of 2.42 and 1.58 for the interaction terms for the incumbent party, CDU, and FDP, indicate an increase in the popularity of more liberal parties. For instance, individuals in districts with a 1% great refugee share are 2.42 times more likely to vote for

CDU. Contrarily, negative significant coefficients of -1.97 and – 2.88 are observed for SPD and the right-wing party, AfD, showing a decrease in voting popularity for both the anti-immigration parties.

In general, voters in democracies have a pattern of either rewarding or punishing political parties in elections depending on their satisfaction with their party's decisions. To understand the influence of refugee influx on voting behavior, the different stances of these political parties on immigration and refugee influx need to be acknowledged (Ward, 2020). The incumbent party, Christian Democratic Party (CDU), opposed limiting residential permits for immigrants and refugees in Germany. The German Chancellor and leader of the CDU party, Angela Merkel, implemented an open-door policy in 2015, allowing millions of Syrian refugees to enter and reside in Germany. The party allowed family members of accepted asylum seekers permission to follow them and live together in Germany. CDU worked towards helping asylum applicants find jobs prior to their visa, to cover their living expenses in Germany (Abdou et al., 2022; Hertner, 2022). Though FDP was more critical of the open-door policy by Angela Merkel, and emphasized more efficient management of the refugee crisis, the party pushed for faster asylum procedures, refugee integration, and cooperation among European nations to address the refugee crisis (Bauder and Semmelroggen. 2009; Göpffarth, 2017). FDP proposed a point-based immigration system and a simpler immigration procedure to promote skilled immigration to Germany. Lastly, FDP addressed the need to allocate aid to the home nations of the refugees to fight the root cause of the refugee crisis. Both parties were more inclined and open toward foreigners and refugees entering Germany.

In contrarily, Social Democratic Party (SPD) party leaders of the SPD, were stricter, and raised concerns regarding Angela Merkel's open-door refugee policy. They expressed apprehensions regarding security threat of accepting refugees, and suggested better security measures to refrain allowing 'terrorists or criminals' along with the refugees. The party leaders claimed that the refugee influx would create economic and social problems, such as the financial burden due to the social services and the employment shortage in the labor market. Lastly, they wanted a faster deportation system for rejected asylum applicants (Schmidtke, 2016; Boswell and Hampshire, 2017). The extreme right, the party with the strictest immigration law proposal, AfD, proposes a "zero immigration policy," implementing a cap on all immigration, creating net immigration of zero or negative. They have continuously called for the deportation of rejected asylum seekers and reforming the German constitution to ensure fewer people are granted asylum. The anti-immigration and Islamophobic party believe migrants or refugees from Muslim-majority countries threaten Germany's security and stability (Art, 2018; Arzheimer, K., & Berning, 2019).

The support for immigrant-friendly and disapproval of anti-immigration parties with the refugee influx indicate improvement in tolerance and acceptance of individuals towards refugees and immigrants. Theoretically, Gordon Allport's (1955) hypothesis that social contact between social groups is ample for reducing intergroup prejudice aligns with the findings of our study. Individuals are now more prone to interact with refugees or immigrants after the influx. In addition, the extensive empirical and experimental research also weighed how interaction challenges prejudice or intolerance by reducing intergroup anxiety and increasing empathy for other groups. For instance, prejudice or intolerance is developed from false

beliefs, misconceptions, and stereotypes; therefore, interaction with outer groups reduces prejudice as false beliefs or misconceptions are erased. The consistency of the intergroup contact theory was robust to Pettigrew and Tropp's (2006) meta-analytic test. They tested 713 independent samples, among which 515 studies found an inverse relationship between contact and prejudice. These findings of improved support for immigrant-friendly parties, and disapproval of anti-immigrant parties are consistent with my previous chapter on tolerance, where the refugee influx made individuals more tolerant towards outer groups. These results are antithetical to the national election results from the 2013 to 2017 federal election, the exact timeline used in this paper, introducing an important finding of our paper. The DID regression analysis interaction coefficient explains how districts with refugee influx (treatment region) behave compared to districts with a minimal or negligible number of refugees. Therefore, contradictory results of acceptance and popularity of pro-immigration parties and disapproval of anti-immigration parties indicate that individuals who are more familiar with and likely to interact with refugees turn out to be more accepting or welcoming towards refugees. The change in national voting results or patterns might be due to individuals in control districts with lower refugee numbers who are less likely to interact with refugees or immigrants. Therefore, based on Stephan and Stephan's (2000) social threat theory, the probable reason for intolerance or unwelcoming attitude towards refugees and immigration in areas with minimum interaction with refugees can be understood to be formed from physical and social threats associated with outer groups (i.e., refugees). As discussed in section 3.1, the dangers can vary from cultural dilution to economic threats of losing jobs or competition in the labor force.

5.2.2 The effect of refugee influx on voting preference

In addition, whether the refugee influx has altered the political party preference of individuals is discussed. Table 5 shows the DID analysis results showing the refugee influx's effect on the voting preferences of individuals in Germany. The voting behavior and preference can be understood to be correlated or as equivalent measures for voting behavior.

Table 5
The effect of refugee influx on political party preference

	Dependent variable: Inclined towards political party			
	Incumbent party CDU (1)	FDP (2)	SPD (3)	Right wing AfD (4)
Refugee numbers	-2.31 *** (0.42)	-1.60*** (0.29)	2.37*** (0.43)	0.48 (0.16)
Post influx	-0.02*** (0.002)	-0.004 (0.003)	-0.03*** (0.004)	0.03*** (0.002)
Refugee numbers * Post influx	1.51*** (0.37)	0.94*** (0.27)	-1.56*** (0.37)	-0.84*** (0.17)
Gender (Female)	-0.02*** (0.003)	-0.01*** (0.001)	-0.02*** (0.003)	-0.01*** (0.001)
Age (years)	0.003*** (0.00001)	0.001*** (0.00004)	0.003*** (0.0001)	0.00004 (0.00003)
Partner (yes)	0.02*** (0.003)	0.01*** (0.0001)	0.001 (0.003)	0.0003** (0.001)
State fixed effects	Yes	Yes	Yes	Yes
Observations	53,522	53,522	53,522	53,522
R-squared	0.05	0.13	0.04	0.01

*Note. This table shows results of the difference-in-differences analysis. The observations are at the individual-level unit. The dependent variable measures whether the individual in inclined towards CDU (column 1), FDP (column 2), SPD (column 3), AfD (column 4). Measured using SOEP question, which political party are you inclined towards. Dummy variables are created of individuals who voted for (1) CDU (2) FDP (3) SPD (4) AfD. In parentheses are the robust standard errors. *Significant at 10% level; **significant at 5% level; ***significant at 1% level.*

Individuals likely vote for the political party they prefer; therefore, the results of this DID analysis using political party preference as the dependent variable is expected to show a similarly significant relationship with the refugee influx. The results show similar significant coefficients of voting preference with refugee influx for political parties such as CDU (2.42 and 1.51), FDP (1.58 and 0.94), SPD (-1.97 and − 1.56), and AfD (-2.88 and − 0.84). The voting behavior or preference results showed that voters changed

their voting behavior with short-term shocks (i.e., refugee influx). This finding opposes the elite cue theory of party positioning, which claims that individuals tend to follow elite individuals, such as party leaders' opinions regarding a particular issue (i.e., refugee influx or the refugee crisis). Instead, the voters let their policy preferences on issues shape their decision to support or vote for a specific political or governing party. The literature claims that voters tend to follow their policy preferences rather than elite cues when they assign high importance to the issue (Chzhen et al., 2014; Weber and Saris, 2015), showcasing how immigration and the refugee crisis are essential to the Germans.

5.3 Lights satellite action; refugee intensity and problems with larger cities.

This study extends beyond knowledge of the effect of refugee influx on voting behavior by exploring the role of economic development play in this relationship. As discussed in the literature review, the current literature emphasizes the influence of economic growth on attitude and acceptance towards refugees implying a probable relationship between refugee influx and voting behavior with economic development. Therefore, a two-stage least square (2SLS) regression is conducted, where the refugee influx is the instrumental variable, and nightlight is the endogenous variable. Tables 6 and 7 below show first and second-stage regression results.

Table 6
The first stage regression using nightlights

	Dependent variable: Economic development (nightlights)
Refugee share	264.97***
	(5.81)
Post influx	-0.12***
	(0.07)
Refugee numbers * Post influx	-43.11***
	(3.50)
Gender (female)	-0.01
	(0.001)
Age (years)	0.002***
	(0.001)
Partner (yes)	-0.15
	(0.04)
State fixed effects	Yes
R-squared	0.33
Observations	54,248

Note. This table shows the results of the first stage of 2SLS analysis. The observations are at the individual-level unit. The dependent variable measures economic development. Measured using VNB nightlights data. In parentheses are the robust standard errors clustered at the regional level. ∗Significant at 10% level; ∗∗significant at 5% level; ∗∗∗significant at 1% level.

The first stage regression result shows significant coefficients for the independent variables when economic development is the dependent variable. We apply the predicted values for the second-stage regression. The following table shows the results of the second-stage regression.

Table 7
The second stage results of 2SLS

	Dependent variable: Voted for a political party in the federal election			
	CDU	FDP	SPD	AfD
	(1)	(2)	(3)	(4)
Economic development	-0.01***	-0.001***	-0.0001	0.01***
	(0.001)	(0.001)	(0.001)	(0.001)
Gender (female)	0.02**	-0.01	-0.01***	-0.02***
	(0.004)	(0.002)	(0.004)	(0.002)
Age (years)	0.003***	0.001***	0.002***	-0.0003***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Partner (yes)	0.05***	0.01***	0.01***	0.01***
	(0.01)	(0.002)	(0.01)	(0.002)
State fixed effects	Yes	Yes	Yes	Yes
Observations	39,646	39,646	39,646	39,646
R-squared	0.07	0.27	0.03	0.02

Note. This table shows the second-stage results of 2SLS. The observations are at the individual-level unit. The dependent variable measures whether the individual voted for CDU (column 1), FDP (column 2), SPD (column 3), AfD (column 4). Measured using SOEP question, which political party you have voted for in the previous federal election. Dummy variables are created of individuals who voted for (1) CDU (2) FDP (3) SPD (4) AfD. In parentheses are the robust standard errors. *Significant at 10% level; **significant at 5% level; ***significant at 1% level.

The results from the 2sls regression in Tables 6 and 7 indicate areas with greater nightlights harm support for liberal parties and improve support for anti-immigration parties such as SPD and AfD. The larger urban areas are expected to emit higher nightlights due to the greater population and better infrastructure. As discussed in previous section, the larger cities are primary destinations for refugees, exacerbating the social, economic, and infrastructure challenges. Therefore, influencing the political situation. For instance, anti-immigration parties gain traction as they capitalize on concerns regarding social cohesion, resource scarcity, and security. Larger cities face a more considerable burden due to higher population densities, urban housing scenarios, and internal migration (Cofrancisco, 2016). The German refugee scenario differs from European neighbors like Turkey, where a larger share of Syrian refugees lives closer to their shared border with Turkey (Altindag and Kaushal, 2017). The refugees are now more informed and do not travel aimlessly as refugee networks share information on countries of

transit and arrival and the availability of information through online news, social media, and mobile communications. Such phenomena have resulted in larger cities across Europe, such as Hamburg, Bremen, Athens, Budapest, Stockholm, and others, being favorites as refugees' hubs or end destinations. According to the International Organization for Migration's report in 2015, two-thirds of all refugees live in urban. The urban concentration due to refugees can be a blessing or curse. For instance, a larger city would mean better economic growth, offering residents better jobs, education, and financial services. Alternatively, population density, housing scarcity, and costs can create a contradictory effect on attitudes toward refugees and immigrants (Noring and Garrelts, 2016). Thus, urban areas with more significant refugee numbers are a good treatment sample for running DID regression. The distribution system of asylum seekers (i.e., refugees) imposes a more significant burden on larger cities as it overlooks the densely populated cities, housing conditions, shortage in urban communities, and secondary migration of locals and refugees seeking better opportunities. In addition, the lack of green or free space in big German cities prevents the allocation of the excess population in lower dense neighborhoods or regions. Irrespective of larger cities, the funding or budget allocation fails to account for rising housing or living costs and per capita social service expenditures in regions with a large refugee population, harming social integration (Cofrancisco, 2016). To further investigate the difference in voting behavior across districts with varying intensities of refugees, the treatment group is divided into three different scales, low, medium, and high.

Table 8
The effect of refugee influx on voting behavior depending on refugee intensity

	Refugee intensity levels across districts		
	Low	Medium	High
	Incumbent party CDU		
Refugee numbers	-3.05***	-4.88***	-2.99***
	(0.37)	(0.64)	(0.54)
Post influx	0.001***	-0.02***	-0.004
	(0.01)	(0.01)	(0.01)
Refugee numbers * Post influx	**1.72***	**2.42***	**0.36**
	(0.45)	**(0.56)**	**(0.36)**
Gender (female)	0.02***	0.02***	0.02***
	(0.004)	(0.004)	(0.004)
Age (years)	0.003***	0.003***	0.003***
	(0.0001)	(0.00001)	(0.0001)
Partner (yes)	0.05***	0.05***	0.05***
	(0.01)	(0.01)	(0.01)
State fixed effects	Yes	Yes	Yes
Observations	39,646	39,646	39,646
R-squared	0.07	0.07	0.07

*Note. This table shows results of the difference-in-differences analysis. The observations are at the individual-level unit. The dependent variable measures whether the individual voted for CDU (column 1), FDP (column 2), SPD (column 3), AfD (column 4). Measured using SOEP question, which political party you have voted for in the previous federal election. Dummy variables are created of individuals who voted for (1) CDU (2) FDP (3) SPD (4) AfD. In parentheses are the robust standard errors. *Significant at 10% level; **significant at 5% level; ***significant at 1% level.*

From Table 8, it can be concluded that the intensity or size of refugee numbers has a role in influencing voting behavior. In districts with a higher percentile of refugees, the influence of refugee influx on voting behavior towards CDU changed from positive to insignificant. In other words, districts with the highest percentile of refugees were not embracing acceptance towards refugees. The large refugee numbers might initiate a more significant economic or cultural threat to overplay the improvement in tolerance

from the interaction, as Allport's (1955) social integration theory suggests. Stephan and Stephan's (2000) integrated threat theory proposed four types of threats: realistic threat, such as safety, economic, and political; and symbolic threat, such as cultural threat, which initiates conflict and prejudice among different groups of individuals with interaction. In 2017, CDU lost 8.6% of votes in the federal election (Clarke, 2017); our results point to the probable reason for occurrence due to voting in districts with no refugee numbers and districts with very high refugee numbers. Figure C1 of Appendix C visually illustrates how districts with the highest refugee numbers are correlated with brighter night lights.

5.4 Financial mechanism: the effect of finance on voting behavior

Theoretically, Stephan and Stephan's (2000) social integrated threat theory lists economic or financial threats as one of the significant threats leading to conflict and prejudice towards outer groups, like the refugee population. An improvement in income or living standards would instinctively reduce the economic threat, a major realistic threat according to Stephan and Stephan's (2000) social threat theory contributing to prejudice and conflict associated with outer groups (i.e., refugees and immigrants). Therefore, an improvement in economic development is expected to show greater tolerance towards outer groups, attaining support for left-wing political parties and vice versa for left-wing political parties.

The fear of financial difficulties, such as losing jobs or lower pay scale due to an increase in competition from skilled and unskilled competition from new immigrant and refugee populations, results in a negative attitude towards outer groups (Austen, 2001; Onraet and Hiel, 2013). Additional individual-level financial controls such as income, unemployment, and financial worry are added. Observing the coefficient of column 2 of the tables in Appendix D shows that the higher the income of individuals, the more likely to support liberal parties and oppose anti-immigration parties. The finding relates as higher income is expected to neutralize the financial threats associated with immigration and refugee influx. Similarly, unemployment (see column 3 Appendix D), shows negative relationship for voting for pro-immigration parties, and vice versa for anti-immigration parties. Considerately, involuntarily, individuals who are not part of the labor force would capture more threats in terms of competition from immigrant and refugee workers joining the labor force. Lastly, financial worry, irrespective of their income or employment status, indicates that individuals who are worried about their finances oppose pro-liberal parties but support anti-immigration parties to avoid competition in the labor force. Despite the additional controls, the model remains consistent, further proving the robustness of the model.

5.5 Robustness checks

5.5.1 Falsification and external validity

To conduct a falsification test, the refugee influx is manipulated and changed to a year prior to the refugee influx, 2014. The purpose of the manipulation is to verify whether the relationship between refugee influx and political voting holds when influx is altered. The results in column 1 of Table E1 in Appendix E indicate the relationship is not spurious, and the relationship is solely due to the refugee

influx. In addition, the treatment (T) and comparison (C) groups are split into two subgroups independently: T1, T2, C1, and C2. The motive is to test whether a significant effect exists when the DID benchmark model is run with samples of T1 'as if' treatment and T2 'as if' control, followed by C1 'as if' treatment and C2 'as if' control. As the groups extracted from either the treatment or control group are identical to the other (i.e., treated with treated; control with control), the analysis results is expected to portray non-significant coefficients. The results In Table E1 in Appendix E confirm the statement. In both scenarios, the effect of refugee influx on these falsified conditions shows insignificant coefficients. Therefore, confirming that the benchmark estimates from the entire sample are not a mere artifact of statistical correlation initiated by factors other than the refugee influx. In addition, these tests rule out potential inter-district migration-related biases; for instance, affected individuals from the same did not migrate to control districts after the refugee influx. However, as DID estimates is not prone to selection biases which might harm the external validity of our model. The nationally representative SOEP data, where participants are selected through a random sampling method based on factors such as gender, age, and other factors is used to develop the experimental treatment and control group based on their exposure to the refugee influx. As the SOEP data is not randomized by individuals' previous exposure to the refugee influx, there is the probability that DID sample systematically excludes a subset of refugee-affected individuals who are not orthogonal to the outcome variable, voting behavior, which might harm the external validity of the results. To address this issue, participants are randomly chosen from the treatment and control groups to test whether results still hold for these sub-samples. The coefficients remain significant in Table E2 of Appendix E. These show that the results are not sensitive to a particular set of samples, providing credible consistency regarding the external validity of the model.

5.5.2 Placebo test and probit analysis

To check whether the model estimates the real impact of the refugee influx, artificial constructs of placebo treatment and control groups were randomly drawn from the entire sample, irrespective of belonging to the treatment or control group (i.e., each individual has the probability of being selected 'as if' affected by refugee influx). The artificially constructed refugee influx dummy shows insignificant results (see Table F1 of Appendix F), indicating the estimates represent a genuine causal relationship rather than a spurious statistical correlation. In addition, as the dependent variable is a binary measure, the estimated coefficient representing the predicted probability may exceed '1' for very high values of regressors, making it impractical as probability cannot be greater than '1'. However, this limitation is not strong enough to challenge our estimates, due to the DID setting used to obtain causal inference from the linear probability model. Nonetheless, the prospect raises questions about the estimates, so a probit analysis is to address this concern (See Table F2 of Appendix F). The probit estimates are similar to linear probability models under the benchmark DID model, further reconfirming the robustness of the model.

5.5.3 Randomisation tests

The identification strategy used in this study is based on the distinct effect of refugee influx on voting behavior and the preference of individuals across districts in Germany. In the sample, the observations in

treatment group are more extensive than the control group, as one-fourth of the districts had less than 1% of the refugee population, harming the credibility of the heterogeneity assumption, as the unaffected individuals risk being different from the affected. Therefore, we followed Heß's (2017) Resampling strategy, a Sequential Monte Carlo (SMC) sampling strategy.

Table 9
Randomisation tests

% Agree with the statement	No controls (1)	+controls (2)	Causal inference p-value (3)	Randomization inference p-value Heß (2017) Resampling (4)
Dependent variable: Voted for CDU				
Refugee numbers * Post influx	0.05		0.000	0.000
Refugee numbers * Post influx		0.07	0.000	0.000
Dependent variable: Voted for FDP				
Refugee numbers * Post influx	0.20		0.000	0.000
Refugee numbers * Post influx		0.27	0.000	0.000
Dependent variable: Voted for SPD				
Refugee numbers * Post influx	0.02		0.000	0.000
Refugee numbers * Post influx		0.03	0.000	0.000
Dependent variable: Voted for AfD				
Refugee numbers * Post influx	0.02		0.000	0.000
Refugee numbers * Post influx		0.03	0.000	0.000
Observations	52,341	39,646		

Note. This table shows results of difference-in-difference analysis. The observations are at the individual-level unit. The dependent variables are measured using the SOEP question, which political party you voted for? The p values were generated from the benchmark model (column 3) and Heß's (2017) Resampling strategy.

Column 3 of the table above indicates the p-value for the benchmark analysis (see Appendix B), followed by column 4 with p-values based on Fisher's two-sided randomization inference test statistic. 1000 sub-samples were drawn for the analysis using Heß's (2017) resampling strategy and DID regression was run to compute p-values. The p-values remain significant for dependent variables, which showed significance in the benchmark model. This test implies that the estimates in the benchmark model are unlikely to be corrupted by slight sample bias or clustered treatment across Germany.

5.5.4 Addressing omitted variables bias

Table 10
Assessing bias using selection observables; Oster's (2019) approach

	Selection in unobservable is equal to selection on observables ($\delta = 1$)	Selection in unobservable is smaller than selection on observables ($\delta = 0.5$)	Selection in unobservable is much smaller than selection on observables ($\delta = 0.1$)
Voted for CDU Panel: Table B1 column 4: controlled β = 2.42			
Bias-adjusted β for $R\,max = \tilde{R} + (\tilde{R} - \dot{R})$	0.09	0.09	0.09
Bias-adjusted β for $R\,max = 1.3\ \tilde{R}$	0.117	0.117	0.117
Voted for FDP Panel: Table B3 column 4: controlled β = 1.58			
Bias-adjusted β for $R\,max = \tilde{R} + (\tilde{R} - \dot{R})$	0.27	0.27	0.27
Bias-adjusted β for $R\,max = 1.3\ \tilde{R}$	0.3	0.3	0.3
Voted for SPD Panel: Table B2 column 4: controlled β= -1.97			
Bias-adjusted β for $R\,max = \tilde{R} + (\tilde{R} - \dot{R})$	0.04	0.04	0.04
Bias-adjusted β for $R\,max = 1.3\ \tilde{R}$	0.052	0.052	0.052

	Selection in unobservable is equal to selection on observables ($\delta = 1$)	Selection in unobservable is smaller than selection on observables ($\delta = 0.5$)	Selection in unobservable is much smaller than selection on observables ($\delta = 0.1$)
Voted for AfD Panel: Table B4 column 4: controlled β= -2.88			
Bias-adjusted β for $R\,max$ = $\tilde{R}$+ ($\tilde{R}$– $\dot{R}$)	0.04	0.04	0.04
Bias-adjusted β for $R\,max$ = 1.3 $\tilde{R}$	0.052	0.052	0.052

Note. This table shows results of difference-in-differences analysis. The observations are at the individual-level unit. The dependent variables are measured using SOEP question, which political party you voted for? Oster's (2019) approach is used for this analysis.

Due to the possibility of our estimates suffering from the exclusion of unobservable factors correlated with selection, we test the extent to which unobserved omitted variables infest the estimates by observing the goodness of fit, R2, before and after controls (See Appendix B). Tables B1 to B4 show that the R2 of the model increases for all four dependent variables in our benchmark model. Similar to Nunn and Wantchekon (2011), an assumption is made that unobservable controls might explain fundamental explain outcomes of observable control, $Rmax$ = $\tilde{R}$+ ($\tilde{R}$– $\dot{R}$) where $\tilde{R}$ is R-squared of a hypothetical model with controls, R denotes the R-squared of the model without controls. Rmax is the R-squared of the hypothetical model, with all relevant observables and unobservables controlled for. We denote ($\delta = 1$) that when the condition of observables and unobservables are equal, the bias-adjusted and unadjusted coefficients are similar. For instance, compare column (1) of table 10 with the controlled β of the dependent variables. In addition, Oster (2019) suggests performing, Rmax = 1.3 $\tilde{R}$ if Rmax is relatively small. When applied, the results show similar coefficients on voting behavior, implying our estimates are robust to omitted variable biases.

6.0 Implications and conclusion

6.1 Implications

The policy implications of this study are twofold. First, individuals with likely more significant interaction with refugees were more accepting of immigration or refugees. For instance, the results showed that the refugee influx favored voting for liberal parties and opposed voting for anti-immigration parties. This

finding aligns with Allport's (1955) social integration theory, as social interaction is noticed to improve relationships and reduce conflict or prejudice, proposing to develop programs and events that promote the interaction of locals with outer groups. Secondly, larger cities have already pre ongoing issues, and refugee influx can exacerbate the economic and infrastructure challenges. Therefore, the government can avoid refugee allocation in crowded large cities where housing prices or infrastructure are already overwhelmed. For instance, our results showed that large cities suffer from a shortage in funding due to failure to account for internal and external migration creating inflationary and shortage problems, which overplay improvement in tolerance from interaction with refugee friends or neighbors.

6.2 Conclusion

The significant movement of migrants or refugees across borders has initiated studies and political debates across the globe. Studies on immigration and refugee influx found refugee influx to influence individuals' physical, social, or psychosocial health or well-being. This paper theoretically contributes by discussing socioeconomic and political partisan theories to provide a better understanding of how German society adapted to the European refugee crisis; in terms of voting. Whereas in empirical terms, the use of DID allows capturing the causal impact of refugee influx on voting behavior. For this study, individual-level data from SOEP data, district-level data from the Statistics Department of Germany, and economic development data from VIIRS DNB nightlights data are used. To find the influence of refugee influx on voting behavior, and whether economic development plays a moderating role in this relation, a DID regression analysis is run, followed by 2SLS. The DID results show that individuals in districts with refugee influx championed more liberal political parties such as CDU and FDP but opposed anti-immigration parties such as SPD and right-wing party, AfD. This finding aligns with Allport's (1954) social integration theory, where interaction is expected to improve the relationship and reduce conflict. The political party partisan with immigration policies developed by parties indicates that individuals weigh great importance on immigration and refugee issues. The results from the 2SLS analysis showed larger cities with better development, were not embracing acceptance towards refugees. Larger cities face a more considerable burden due to higher population densities, urban housing scenarios, and internal migration. The large refugee numbers might stronger economic or cultural threat to overplay the improvement of tolerance from the interaction, as Allport's (1955) social integration theory suggests. The results of the analysis are significant across different robustness tests. For instance, falsification, placebo, and randomization tests followed by addressing omitted variable biases show consistent results. From our results, we can claim that the increase in popularity of right-wing parties and the simultaneous fall in popularity of left-wing parties are due to districts with very low or no refugee numbers and very high refugee numbers.

There are certain limitations of this study. Though DID regression is a non-experimental statistical technique replicating randomized control trials (RCT), it is not as effective as RCT and is prone to participant and response bias. Participants of the SOEP survey may have answered the more desirable answer of the survey to present a favorable image of themselves in questionnaires; this phenomenon is known as socially desirable responding (SDR). In addition, due to the EU's lack of data and privacy law,

this study is restricted to district-level analysis; further research can be conducted to observe the influence of refugee influx on municipalities with more significant refugee numbers compared to municipalities with modest numbers. As refugee reception centers are located in municipalities in districts, the exposure to a refugee can be better captured and studied if the analysis is done across municipalities. Further research can also be aimed toward testing policies or field behavioral studies promoting better integration of refugees in local communities in Germany.

Declarations

Author declares no competing interest

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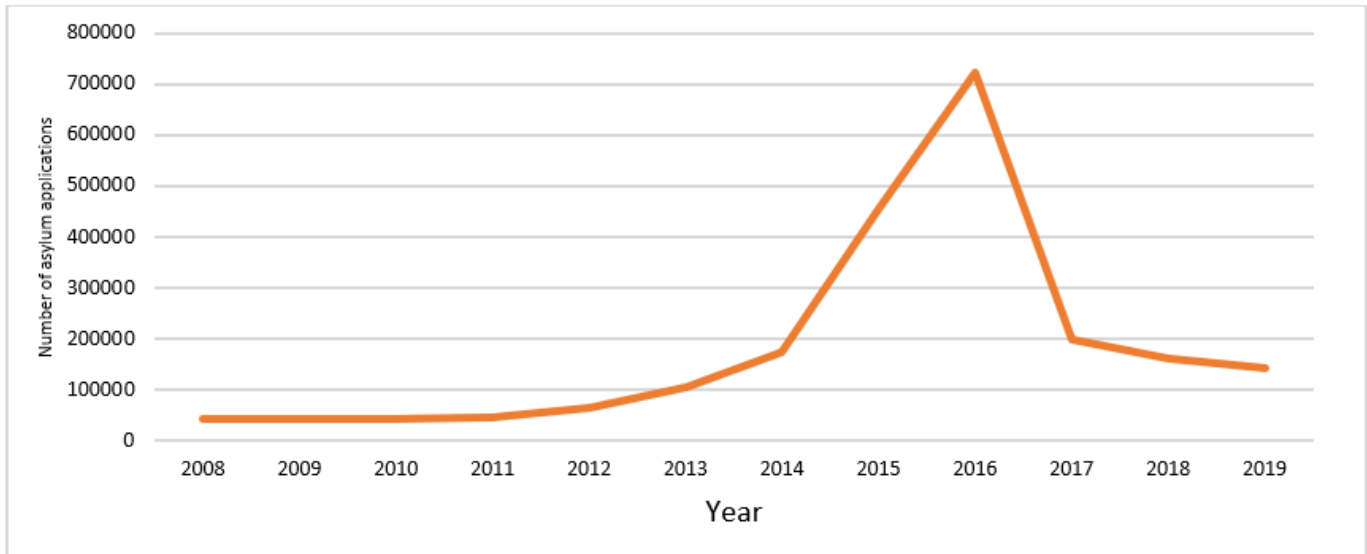
Figures

Figure 1

A graph showing Germany's number of asylum applications from 2008-2019.

Note: The data is collected from Statistisches Bundesamt (federal office statistics of Germany). The asylum applications show Germany's refugee applications from 2008 to 2019.
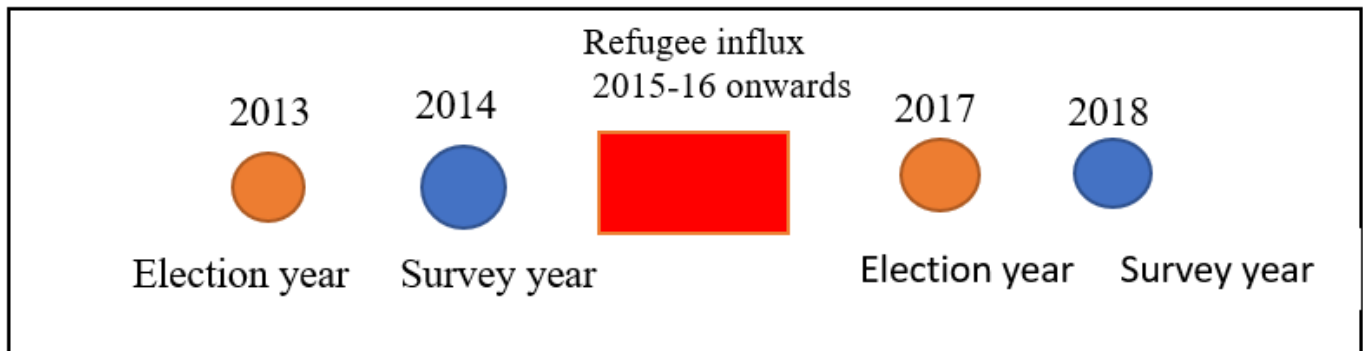

Figure 2

The time frame of the control – influx – treatment years

Note: The figure shows the control year as 2013, the treatment year as 2,018 in between refugee influx year as 2015.

Supplementary Files

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- Appendix.docx