

Bach, Stefan et al.

Article

Refugee integration: A worthwhile investment

DIW Economic Bulletin

Provided in Cooperation with:

German Institute for Economic Research (DIW Berlin)

Suggested Citation: Bach, Stefan et al. (2017) : Refugee integration: A worthwhile investment, DIW Economic Bulletin, ISSN 2192-7219, Deutsches Institut für Wirtschaftsforschung (DIW), Berlin, Vol. 7, Iss. 3/4, pp. 33-43

This Version is available at:

<https://hdl.handle.net/10419/149812>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

Refugee integration: a worthwhile investment

By Stefan Bach, Herbert Brücker, Peter Haan, Agnese Romiti, Kristina van Deuverden, und Enzo Weber

The initial fiscal costs associated with refugee integration are quite high—but as more and more refugees join the labor force, a reduction in ongoing welfare costs and an increase in government revenue will result. Against this background, the Institute for Employment Research (IAB) in Nuremberg and DIW Berlin conducted a joint investigation (funded by the German Federal Ministry of Labor and Social Affairs) into the overall economic and fiscal impacts of investing in the labor market integration of the refugees who arrived in Germany in 2015. The results show that investing in refugees' language skills and educational qualifications promises high returns.

In 2015, roughly 890,000 newly arrived refugees were registered in Germany.¹ In this study we examine how additional investment in their integration will impact the fiscal balance of public budgets. Our analyses are based on a macroeconomic simulation model jointly developed by DIW Berlin and IAB.² In this model, we simulate the German labor market integration of the refugees who immigrated in 2015, as well as the resulting macroeconomic and fiscal effects, through the year 2030.

First of all, it must be noted that as with any economic projection, estimates of the macroeconomic and fiscal effects from refugees and asylum seekers based on such simulations are often highly uncertain and depend to a significant degree on a wide array of assumptions (Box 1). The findings of these studies thus vary widely. Our simulations are based on assumptions regarding the number of asylum seekers, ongoing family reunification, the duration and approval rate of asylum procedures, and sociodemographic data, including age, gender, professional and educational qualifications, German language competence, and family background.

To empirically substantiate our central assumptions, we use 2013 data from the IAB-SOEP Migration Sample, which contain information on persons who sought protection in Germany after 1995 as well as those living in their households. The demographics and qualifications of refugees who migrated to Germany during this period are largely similar to those of the 2015 refugees: in both groups, for instance, roughly 70 percent of working-age asylum seekers had no vocational training background upon arriving in Germany.³

1 Herbert Brücker, "Typisierung von Flüchtlingsgruppen nach Alter und Bildungsstand," Institut für Arbeitsmarkt- und Berufsforschung, Aktueller Bericht no. 6 (2016).

2 Stefan Bach, Herbert Brücker, Kristina van Deuverden, Björn Fischer, Peter Haan, Agnese Romiti, Enzo Weber, "Abschätzung von Effekten der Integration von Flüchtlingen. Kurzexpertise für das Bundesministerium für Arbeit und Soziales." Berlin: Politikberatung kompakt 114 (2017).

3 Brücker, "Typisierung von Flüchtlingsgruppen nach Alter und Bildungsstand." Aktueller Bericht no. 6 (2016).

Box 1

What is a "refugee?"

The term "refugee" is used here not in the legal sense, but rather as a collective term for all migrants—regardless of their legal status—who have come to Germany seeking protection. Thus in addition to those who are recognized as refugees and asylum seekers according to Article 16a of the German Constitution and the 1951 Refugee Convention or who have obtained another kind of protected status, the term includes migrants who have yet to register as asylum seekers, are currently undergoing the asylum approval process, or have had their asylum application rejected.

The following will deduce and describe the development of the 2015 refugee cohort—including their labor market integration and the growth of their productivity—through 2030. This information serves as the basis for the simulation model.

To assess the impact of stronger labor-market integration measures, we compare the fiscal effects of two different scenarios within this model. In a baseline scenario, we simulate costs and effects assuming that refugee integration will function roughly the same over time – that is, that the 2015 refugees' integration patterns will mirror those of earlier refugee cohorts. It is important to note that much less was being invested in the integra-

tion of refugees at that time, and this shapes our baseline scenario.⁴

Our second scenario simulates the impact on costs and effects arising from the linguistic and vocational integration training measures that were implemented in 2015, and assumes a further expansion of integration measures overall.

Development of the refugee population and the labor supply

According to the core data system, 890,000 new refugees registered in Germany in 2015. Regarding the further development of the 2015 refugee cohort, we assume the following:

- Only 16 percent of all asylum applications submitted by the 2015 refugees are decided upon within the first year.
- Another 10 percent of the approval procedures conclude early, as some applicants depart before receiving a decision (18 percent in 2015), among other reasons.
- The rate of protection⁵ will increase from 50 percent in 2015 to 65 percent in 2016 due to changing circumstances in the countries of origin.
- Starting in 2017, the overall refugee population will increase at an annual rate of 2.8 percent relative to the number of recognized refugees already living in Germany due to family reunifications—a rate that is twice as high as that of other immigrants from outside the EU.
- By 2030, this rate will have gradually dropped to zero.
- Half of the those who immigrate under family reunification laws are children, adolescents, or working-age women.
- Among the 2015 refugees who are ultimately granted asylum, 24 percent are children and adolescents under the age of 18, 58 percent are working-age men, 17 percent are working-age women, and one percent are older than 65.
- The annual mortality rate in the oldest group amounts to 3.5 percent.
- The annual birthrate among 15- to 49-year-old women decreases from roughly ten percent to just under nine percent by 2030 due changes in the age structure—but for 2016, this rate is estimated to be only half of this value due to refugees' current living situations.

Table 1

Development of 2015 refugee cohort including family reunification and births

Annual average population

	2015	2016	2017	2020	2025	2030
refugees with protection status	20,072	244,843	522,549	465,047	357,742	274,412
reunified family members	-	-	6,856	40,235	59,605	52,312
births	-	2,066	11,381	39,783	80,302	110,722
total	20,072	246,909	540,786	545,065	497,649	437,446
<i>of these:</i>						
below 16 years	4,897	59,071	130,901	148,110	157,357	157,620
16 to 64 years						
males	11,601	141,891	303,086	268,257	197,881	134,438
females	3,372	42,827	98,725	117,692	128,604	129,840
65 years and older	201	3,120	8,074	11,007	13,807	15,549

Source: authors' own calculations.

⁴ This refers to the period before the implementation of the 2015 integration measures for asylum seekers. According to the Immigration Act from 2005, participation in integration courses was typically limited to recognized refugees.

⁵ The "protection rate" refers to the share of approved asylum seekers or refugees recognized as such (according to 1951 Refugee Convention definitions) who are granted subsidiary protection or another type of residence permit for humanitarian reasons.

- Every year, five percent of the recognized refugees and tolerated asylum seekers from the 2015 cohort (including their German-born children and the family members with whom they are reunified) who are living in Germany will leave the country, which amounts to half the average departure rate of Germany's foreign population as a whole.
- The number of rejected asylum seekers will decline in annual increments: to 50 percent, 25 percent, 12 percent, 5 percent, and finally to zero percent of the original population due to departures and repatriations.

The time series for the immigration of the 2015 refugee cohort including the associated births and family reunification-related migrations is shown in Table 1. With regard to the figures from 2015 and 2016, it must be noted that the later in the year an asylum seeker's application is approved, the less weight their case is given in the yearly average. The number of recognized refugees will rise to 522,000 in 2017 before decreasing—given the assumptions on net migration and mortality—to 274,000 by 2030. By the end of the simulation period, the refugees will have had roughly 111,000 children. In total, the immigration of the 2015 refugee cohort (including family reunification and births) will increase Germany's population by approximately 437,000 people by 2030.

Gradual labor market integration

The IAB-SOEP Migration Sample and the closely related IAB Integrated Employment Biographies (IEB) contain comprehensive information on the employment and earnings of refugees who mostly arrived between the beginning of the 1990s and 2013⁶ (Box 2). Since the corresponding data for the 2015 cohort are incomplete, we apply the profiles from previous cohorts to create profiles for the 2015 cohort's baseline scenario.

Based on these past profiles, we assume that in the year of arrival, 69 percent of the 2015 refugees aged 18 and over have no professional or academic qualifications, 17 percent have an intermediate vocational qualification (comparable to a specialist qualification from a German school), and 14 percent have a polytechnic or university degree.

This structure is similar to the Federal Employment Agency (BA) data on the current qualification of the refugees and non-refugees living in Germany who also immigrated from countries with large numbers of asylum seekers: according to the BA statistics, 71 percent of citizens from asylum-seeker countries of origin such

⁶ The IAB-SOEP Migration Sample includes two kinds of anchor persons: those who arrived after 1995, and their household members who may have arrived in Germany prior to then.

Box 2

The IAB-SOEP Migration Sample

The IAB-SOEP Migration Sample is a longitudinal survey of migrants who came to Germany or entered the German labor market in or after 1995. Because household members are also surveyed, the sample includes migrants who arrived before 1995, as well.¹

Approximately 15 percent of the roughly 3,700 migrants in the IAB-SOEP Migration Sample report that they are registered as asylum seekers or refugees. On average, this group has been living in Germany for 15 years.

If the respondents consent to it, their survey data can be linked with their corresponding IAB Integrated Employment Biographies (IEB), which contain precise information on dependent employment and income. Our analyses of the effects of refugee integration are based on these linked data.

¹ Herbert Brücker et al., "Die IAB-SOEP-Migrationsstichprobe: Leben, lernen, arbeiten—wie es Migranten in Deutschland geht," IAB Brief Report no. 21 (2014) or DIW *Wochenbericht* no. 43 (2014); Herbert Brücker et al., "The new IAB-SOEP migration sample: an introduction into the methodology and the contents," SOEP Survey Papers, Series C, 216, Berlin (2014).

as Afghanistan, Iraq, Iran, and Syria have completed no vocational training.⁷

According to IAB-SOEP Migration Sample, the employment rate⁸ among 18- to 64-year-old past refugees⁹ amounted to 14 percent in the year of entry and rose to about 70 percent within the next 15 years. If self-employed workers are included, the employment rate is roughly five percentage points higher (Box 3).

If these figures are extrapolated to the 2015 refugees, the employment rate for the latter group will likewise increase from 14 percent in the year of entry to 74 percent fifteen years later, in 2030 (Table 2).

⁷ Herbert Brücker, Andreas Hauptmann, and Ehsan Vallizadeh, "Flüchtlinge und andere Migranten im deutschen Arbeitsmarkt: Der Stand im September 2015," Institute for Employment Research (IAB), Aktuelle Berichte 14 (2015).

⁸ This employment rate is based on individuals who are in dependent employment, registered as unemployed, receiving benefits, or seeking jobs according to the IEB. It cannot be compared with the employment rate as a share of the labor force—for example, as defined by the Labour Force Survey. The same calculation method was used for the German comparison group.

⁹ The employment rates given here differ from those described in Brücker et al. (2015), among others, as these studies refer to rates among 15- to 64-year-olds, not 18- to 64-year-olds.

Box 3

Past refugee labor market integration

Table 2 illustrates, among other things, the development of the employment rate according to level of qualification.¹ At the beginning of the integration process, the employment rate among low-skilled workers (without vocational training or academic backgrounds) is higher than among middle-skilled and highly skilled workers (those with vocational training or academic backgrounds) by six and five percentage points, respectively. Fifteen years after arrival, the employment rates among middle-skilled and highly skilled workers are eight percentage points and 14 percentage points higher, respectively, than those

among low-skilled workers. Overall, the employment rate at that point amounts to roughly 70 percent.

Our simulations also draw from IAB-SOEP Migration Sample data regarding the share of mini-jobbers and self-employed workers among the refugees. If self-employed persons are taken into account, the employment rate 15 years after arrival amounts to 75 percent—which is four percentage points below the national average.²

1 Due to a low number of cases in the individual time-qualification cells, the development of the employment rate for the three qualification groups was imputed using a regression.

2 In interpreting this result, an age-related effect must be taken into account: 15 years after arrival, most refugees are between the ages of 40 and 55—that is, they fall into age groups with very high employment rates according to the German national average (80 to 90 percent).

Table 2

Rates of dependent employment, self-employment, and overall employment among 18 to 64 year olds in the 2015 refugee cohort (by skill level)

Shares (in percent)

	2015	2016	2017	2020	2025	2030
Dependent employment rate¹						
Qualification level low	15.9	26.7	36.8	43.6	60.2	64.8
medium	9.7	20.6	32.9	50.2	66.7	72.4
high	10.5	21.2	35.1	48.5	73.7	78.3
all	14.4	25.0	35.7	46.3	64.0	69.6
Self-employment rate²						
Qualification level low	-	-	-	2.4	2.4	2.4
medium	-	-	-	6.9	6.9	6.9
high	-	-	-	9.2	9.2	9.2
all	-	-	-	4.8	4.8	4.8
Employment rate³						
Qualification level low	15.9	26.7	36.8	46.0	62.6	67.2
medium	9.7	20.6	32.9	57.1	73.5	79.3
high	10.5	21.2	35.1	57.7	82.9	87.5
all	14.4	25.0	35.7	51.1	68.8	74.4

¹ Share of dependent employees among 18 to 64 year olds.

² Share of self-employed persons among 18 to 64 year olds.

³ Share of all employed persons among 18 to 64 year olds.

Notes: The dependent employment rates have been taken from the linked data of the IAB-SOEP Migration Sample and the Integrated Employment Biographies (IEB). Shares in individual skill- and year cells have been imputed. The self-employed rates come from the IAB-SOEP Migration Sample. The employment rate is calculated as the sum of the dependent-employment rate and the self-employment rate.

Source: IAB-SOEP Migration Sample, IEB, authors' own calculations.

While more than two-thirds of the 2015 working-age refugees have no vocational qualifications upon arrival, this proportion will drop to 55 percent by 2030.

The labor market integration pattern of refugees who arrived between 2005 and 2013 serves as our baseline scenario. Due to institutional arrangements that were in place until 2015 and which have since been augmented, this scenario is characterized by a low level of investment in integration measures (Box 4).

Slow wage convergence

The IAB-SOEP Migration Sample and the IEBs also contain precise data on the daily earnings of the dependent employees¹⁰ surveyed. This information is used to compare the development of refugee income with that of the median earnings of all dependent employees in Germany (Box 5).

According to these data, the daily earnings of dependent employed refugees in the year of arrival amount to 54 percent of the German national median. Fifteen years after migration, this share rises to 72 percent, with low-qualified refugees earning 66 percent of the median (Table 3) and those with intermediate qualifications or university degrees earning 77 percent. Between the two latter groups, those with university degrees had a clear

10 The IAB-SOEP-Migration Sample covers all persons, and thus overall employment as well. However, the IEB data—from which we derive the precise wage information—includes only dependent employees subject to social security contributions. The self-employed and some civil servants (*Beamte*) who are not subject to social security contributions are therefore not included.

Box 4

Integration investment in the past

Before 2015, little was being explicitly invested in refugee integration, with integration courses open only to recognized refugees. After the Asylum Procedures Acceleration Act was implemented on October 24, 2015, such courses became available to all asylum seekers regardless of protection status.

The 2005 Immigration Act introduced integration courses—similar to the ones that had been in place for other migrants—for recognized refugees. The majority of the surveyed refugees from the IAB-SOEP Migration Sample migrated well before then. Although past refugees had access to education facilities, special support programs did not exist. The low number of refugees who earned vocational or higher education degrees in Germany indicates that little was being invested in integration in the past. To this extent, the baseline scenario can be viewed as a representation of the low-investment integration process and the second scenario as a higher-investment situation.

advantage: after ten years, they were earning substantially more than individuals with intermediate qualifications.

The education premiums for refugees—especially the ratio of premiums for refugees with high qualifications to premiums for refugees with intermediate qualifications—are remarkably low compared to the typical returns on education in Germany. This can be attrib-

Box 5

Calculating the refugee income convergence

To compare the development of the refugees' earnings relative to German average over time, we calculated the ratio of the annual income of each survey respondent to the median earnings of all dependent employees in Germany. Among other things, such a method can help avoid distortions that may result from the fact that individuals migrated at different points in time, and thus were working in environments with different wage levels (1995 vs. 2010, for example). Because the IABs do not contain information on the number of working hours, the calculations are based on the relationship between the full-time incomes of both groups. Due to a low number of cases, we imputed the incomes for individual groups (level of qualification and year of arrival).

Table 3

Daily earnings of the 2015 refugee cohort (by skill level)

		2015	2016	2017	2020	2025	2030
Daily earnings relative to the median of all dependent full-time employees (in percent)							
Qualification level	low	50.9	50.9	50.9	59.1	62.3	65.9
	medium	62.2	62.2	62.2	69.1	72.1	76.6
	high	69.1	69.1	69.1	74.9	77.8	77.4
all		54.4	54.4	54.4	63.5	67.9	71.8
Daily earnings (in euros) of dependent full-time employees according to 2013 prices and conditions							
Qualification level	low	54.4	54.4	54.4	62.6	68.2	68.2
	medium	66.5	66.5	66.5	73.2	79.3	79.3
	high	73.9	73.9	73.9	79.3	80.1	80.1
all		58.1	58.1	58.1	67.3	74.4	74.4

Notes: Daily earnings have been taken from the linked data of the IAB-SOEP Migration Sample and the Integrated Employment Biographies (IEB). The relative earnings are defined as the ratio of refugees' median earnings to the median earnings of all dependent employees (in percent). The shares of the relative daily earnings have been imputed in individual skill/year cells. All earnings have been normalized to the price levels and productivity levels of 2013.

Sources: IAB-SOEP Migration Sample and IEB; authors' own calculations.

© DIW Berlin 2017

uted to the fact that many highly qualified refugees are employed below their formal training level.

It is also important to note that many foreign qualifications are factored into these calculations, and these degrees tend to generate little revenue on the German labor market. Reasons for this include a lower efficiency (or quality) of certain foreign education systems, differences in curriculum design, incomplete information regarding the value of the degrees, the refusal to recognize certain qualifications,¹¹ and discrimination. Thus in the following policy scenarios characterized by higher levels of investment in language and education, significantly higher earnings are calculated for degrees acquired in Germany.

Adjusting for general wage inflation since 2013, we assume that the monthly earnings of 2015 refugees employed full-time in the year of arrival will average 1,764 euros and rise to 2,251 euros 15 years later.¹² Even the median income of the 2015 refugees with low qualifications who are working full-time is 10 euros per hour (in 2013 terms) in the year of arrival and thus significantly

¹¹ With the 2013 Federal Recognition Act, the conditions for degree recognition have improved at the institutional level.

¹² It is not possible to convert daily earnings to hourly wages—for example, by dividing them by an average of eight working hours—because this requires specific information on the number of working hours over the course of one year. The monthly earnings used here refer to the duration of the employee contracts—that is, they include weekends and holidays. Here, we use the average annual working hours as the basis for the conversion to approximate the actual hourly wage levels.

higher than the minimum wage that has been in place since 2015 (8.50 euros per hour). This extrapolation takes into account inflation and productivity development.

According to these calculations, a worker who is employed full-time year-round without interruption thus earns an average annual gross income of 21,164 euros in the year of arrival and 27,063 euros 15 years later, at prices and labor productivity based on data from 2013.

Macroeconomic and fiscal effects

Below, we analyze the impact of the 2015 refugee migration on finances and the overall economy; what we find is a slight increase in income and value added as more and more refugees join the workforce.

The simulation of the effects of refugee migration on the overall economy is based on a macroeconomic model approach. This model employs a production function to derive the additional value added as well as the impact on the functional income distribution resulting from the addition of refugee immigrants to the labor force as well as the corresponding capital investment (Box 6).

There may also be other “multiplier effects”—such as those that may arise from a gradual expansion of government demand or additional consumer spending and investment—but whether and to what extent they materialize is difficult to predict.¹³ We have thus calculated three scenarios that comprise additional multiplier effects of zero, 25 percent, and 50 percent, respectively. (The baseline scenario contains a moderate multiplier effect of 25 percent.)

The effects on government expenditure are derived from the labor market integration scenarios using estimates of rates per capita for the relevant government expenditure items. On the expenditure side, personal expenses such as benefits under the Asylum Seekers’ Benefits Act and basic income benefits—including accommodation and healthcare costs—as well as administrative expenditure are taken into account proportionally. Later in the simulation period, *Kindergeld* (child allowance), childcare, and education costs will factor in more heavily (Box 6).

Because refugee migration has no direct effect on general government expenditures—such as those related to administration, defense, public policy and security, public infrastructure, research funding, environmental protection, or subsidies—they are not taken into account

here.¹⁴ While other studies include refugee cohorts from multiple years, our study focuses solely on the refugees who arrived in 2015 and the family members who will join them over the next 15 years.

We simulate the impact on government income based on the additional revenues that arise in the macroeconomic scenarios.

As more and more refugees integrate into the labor market over the course of the simulation period, the GDP will increase by about nine billion euros, or 0.3 percent (Table 4), with the largest share of this income increase (after taxes and social contributions) attributable to the refugees. But the incomes of Germany’s existing population will also experience a slight boost, an effect that is primarily due to additional business and asset income as well as the multiplier effects of the expansion of demand.

Although this gradual rise in income will immediately lead to higher revenues from taxes and social contributions, the expenditure on refugees will initially exceed this income—especially in the first few years after their arrival. For the entire simulation period, there will be an annual deficit amounting to 2.1 billion euros, which corresponds to 0.07 percent of the 2015 GDP, or 26 euros per inhabitant. Interest is not taken into account when calculating this deficit. In the scenario with zero multiplier effects, the average annual deficit amounts to 3 billion euros; in the scenario with a multiplier effect of 50 percent, it drops to 1.2 billion euros.¹⁵

Despite the increasing labor market integration and the inclusion of moderate demand effects, the annual financial balance will remain negative throughout the entirety of the simulation period (Table 4), largely due to the fact that expenditure on *Kindergeld* (child benefits), childcare, and education will increase as refugees have more children over time. In contrast to other recent calculations, such as those of Fratzscher and Junker (2015), our simulations also consider the hypothetical German-born

¹³ Marcel Fratzscher and Simon Junker, “Integration von Flüchtlingen: eine langfristige lohnende Investition,” *DIW Wochenbericht* no. 45 (2015).

¹⁴ To the extent that expenditure in some of these areas can change with the size of the population, some additional costs may arise in administration, security (for instance in the police, justice, and fire departments), or public passenger transport, among others. In regions with high levels of immigration, public infrastructure may also need to be updated. Long-term scenario calculations according to generational accounting methods make blanket assumptions to account for these costs; see Holger Bonin, “Der Beitrag von Ausländern und künftiger Zuwanderung zum deutschen Staatshaushalt,” Gütersloh: Bertelsmann Foundation (2014); Holger Bonin, “Gewinne der Integration: Berufliche Qualifikation und Integrationstempo entscheiden über die langfristigen fiskalischen Kosten der Aufnahme Geflüchteter,” Heinrich Boll Foundation, *böll.brief* no. 1 (2016); Bernd Raffelhüschen and Stefan Moog, “Zur fiskalischen Dividende der Flüchtlingskrise: Eine Generationenbilanz,” ifo Schnelldienst, vol. 69, no. 4 (2016); Federal Ministry of Finance, “Vierter Bericht zur Tragfähigkeit der öffentlichen Finanzen,” (2016).

¹⁵ For a detailed discussion, see Stefan Bach et al. (2016).

Box 6

The simulation model¹

The effects on the GDP and functional income distribution are simulated using a macroeconomic production function that is based on relevant data from the national accounts. Aggregate production factors include the labor volume of workers (in number of hours worked) according to level of qualification (low, intermediate, and high), the labor volume of self-employed workers, and the capital stock, which is measured as gross fixed capital at replacement costs for all economic sectors. We use a translog specification of the production function¹ and draw on the elasticities of the production factors from the literature.² For low-skilled workers, we assume an income elasticity of -0.2 in relation to the change in low-skilled employment. This means that when low-skilled employment increases by one percent, the reduced employment levels of the existing workforce or decreasing wages lead to a 0.2 percent drop in the earnings of low-skilled workers.

¹ Thomas Bauer, "Lohneffekte der Zuwanderung: eine empirische Untersuchung für Deutschland," *Mitteilungen from the Institute for Employment Research* 30, no. 3 (1997), p. 652-6, or Hermann Buslei and Viktor Steiner, "Beschäftigungseffekte von Lohnsubventionen im Niedriglohnbereich," (1999). Empirically estimated elasticities between production factors can be used for our model, which makes it much more flexible than a Cobb-Douglas Production Function. See Ulrich van Suntum and Daniel Schulte-wolter, "Kosten und Chancen der Migration," *ifo Schnelldienst* 2016 vol. 69, issue 04 (2016), which assumes a substitution elasticity of one between the production factors.

² The key findings are not sensitive to changes in the elasticities; this is also true if we assume an income elasticity of -0.3 for the low-skilled workers.

For all workers with intermediate qualifications, we assume that immigration will not have any impact on employment and income. For highly qualified workers, we assume an elasticity of 0.1 based on the change in low- and middle-skilled employment. For the capital stock, we assume a small open economy with elastic capital flows and a delayed complementary adjustment of capital stock. Based on these assumptions, we simulate the GDP as well as the components of the distribution of national accounts—that is, employee compensation, entrepreneurial and property income, depreciation, and net production taxes.

Apart from the equilibrium effects, this also accounts for the possibility of indirect or "multiplier" effects that are generated each year by additional consumer spending, investment, and government expenditure.³ These assumptions are subject to great uncertainty and have been criticized in the wider scientific discourse. For the baseline scenario, we simulate the macroeconomic effects assuming a lower additional multiplier effect of 25 percent of the additional income; in the two alternative scenarios, effects of zero and 50 percent are assumed, respectively.

³ Marcel Fratzscher and Simon Junker, "Integration von Flüchtlingen: eine langfristig lohnende Investition," *DIW Wochenbericht* no. 45 (2015).

children of the 2015 refugee cohort. The fiscal returns on these expenditures will not materialize until 2030.

If the expenditures on refugees' German-born children are omitted—as has been the case in previous studies—the results indicate a slight impact on macroeconomic effects and a strong impact on fiscal effects. The growth in GDP, aggregate income, and government revenue is only slightly lower in the baseline scenario (multiplier effect of 25 percent) than it is in the scenario that includes births, but government expenditures decline significantly, to the point that the average annual deficit will shrink to 1.3 billion euros—that is, 0.04 percent of the 2015 GDP or 16 euros per inhabitant.

In this scenario, the ongoing annual fiscal balance will be positive after 11 years and will increase thereafter. If we take into account the additional net income of Ger-

many's current population and attribute the entire additional state deficit to them, as did Fratzscher and Junker (2015), the ongoing annual balance will be positive from 2021 onward, and continue to increase until 2030.

Our simulation period ends in 2030, after which the cumulative financial deficit will start to decline provided that the labor market integration continues to increase at the previously assumed rate or higher. But when the 2015 refugees start retiring later on in the simulation period, it could worsen the fiscal balance. As discussed above, immigration may lead to additional costs in the longer term—especially for the creation of public infrastructure or publicly subsidized housing—which are not taken into account here.¹⁶

¹⁶ Bach et al. (2016).

Tabler 4

Macroeconomic and fiscal effects of 2015 refugee immigration

Baseline scenario. multiplier effect of 25 percent. billion euros

	2015	2016	2017	2020	2025	2030	Yearly average	as percent of 2015 GDP	For information: Euros per inhabitant (yearly average)
Gross domestic product (GDP)	959	3,650	7,315	9,832	10,683	9,769	9,019	0.30	110
Net national income (factor costs)									
Total	626	2,379	4,761	6,313	6,856	6,244	5,794	0.19	71
after taxes and social contributions									
Total	366	1,426	2,931	3,968	4,328	3,913	3,634	0.12	44
Immigrants	23	503	1,560	2,599	3,116	2,871	2,440	0.08	5,579
Non-immigrants	343	923	1,372	1,369	1,212	1,042	1,194	0.04	15
Public finances									
Revenues									
Social contributions	194	737	1,397	1,653	1,750	1,609	1,519	0.05	19
Taxes	180	650	1,254	1,662	1,803	1,663	1,531	0.05	19
Expenditures	3,538	7,659	6,437	5,570	4,786	4,305	5,160	0.17	63
Fiscal balance	-3,163	-6,271	-3,786	-2,255	-1,233	-1,033	-2,110	-0.07	-26

Source: authors' own calculations.

© DIW Berlin 2017

Impact of the acquisition of educational degrees and language skills

Using data from the IAB-SOEP Migration Sample as a basis, we analyze the returns resulting from the investment in education and German language skills, then estimate the impact of higher professional qualifications and language competence on the employment rates and wages of 18- to 64-year-old refugees (Box 7, online appendix, and Table 5).¹⁷

The estimation results (Table 5) indicate high returns in the case of labor market integration through the acquisition of German language skills as well as a German professional degree, specifically: in the model's base specification, a German vocational training or academic degree increases the probability of employment (Regression 1) by nearly 20 percent (with a 90% confidence interval ranging from 10 to 29 percentage points), and the average wage by nearly 23 percent (Regression 4, 90% confidence interval ranging from 8 to 39 percentage points).

Similarly, substantial gains are associated with improved German language proficiency; in the base specification, "good" or "very good" speaking, reading, and writing skills—in comparison to the reference group, whose members do not have "good" or "very good" skills in all

three of these dimensions—increases the probability of employment by just under 19 percent (with a 90% confidence interval ranging from eleven to 27 percentage points). Compared to the reference group with low German language skills, the wages of refugees with "very good" or "good" German skills increase by nearly 18 percent.¹⁸

The remaining regressions, which also contain additional variables that control for individual heterogeneity, yield similar results (Table 5, regressions 2 and 3 or 5 and 6).¹⁹ In this respect, the results can be considered robust. Nevertheless, these relationships should be causally interpreted—and due to the small number of observations, they are also subject to a degree of uncertainty.

If the results of the assessment are taken at face value, investment in German professional degrees and language skills will have a significant impact on refugee employment rates and incomes: if the share of refugees who obtain a vocational or university degree in Germany increased by 20 percent by 2030—that is, from 13 to 33 percent—the employment rate would increase by

¹⁸ These results apply in the case of a given educational qualification, as language proficiency and educational qualifications are simultaneously included in the regressions.

¹⁹ Other IAB estimates for all German employees yield comparable results. See Karl Heinz Hausner et al., "Qualifikation und Arbeitsmarkt: Bessere Chancen mit mehr Bildung," Institute for Employment Research, IAB-Brief Report no. 11 (2015).

¹⁷ Individuals currently enrolled in training programs are not factored in to these estimations.

Box 7

Estimating revenues resulting from investment in education and language acquisition

Using the IAB-SOEP Migration Sample and the linked Integrated Acquisition Biographies (IEB), we estimate the revenue from investment in vocational training and academic education and language acquisition.

The IAB-SOEP Migration Sample contains data on the acquisition of vocational qualifications and university degrees, as well as information on language skill levels. For the purposes of our study, all respondents with "good" or "very good" language skills reported such skill levels in all three dimensions (speaking, reading, writing)¹—which corresponds to a Level B2, the minimum required to qualify for a German-speaking job. We estimate the effects of educational qualifications and language skills on

¹ The possible answers for survey questions regarding language skill levels are "no," "poor," "fair," "good," and "very good."

employment probability (Regressions 1–3) and (daily) earnings (Table 5).

In addition to considering German qualifications and German language skills, the estimates in Table 5 also take into account a number of other control variables.² In order to control individual heterogeneity—which can lead to distorted results when particularly productive migrants participate in German vocational training and academic qualification and language classes—Regressions 2 and 4 also consider the employment and professional experience before arrival, while Regressions 3 and 6 factor in indicators for individual cognitive abilities such as school grades in mathematics and foreign languages.

² Age, gender, German language skills, and vocational education and training qualifications before arrival as well as control variables for country of origin and the region of Germany where they are based.

about four percent, the income by 4.6 percent (always relative to the entire refugee population). If the proportion of refugees with "good" or "very good" German skills increased by 20 percentage points—that is, from 46 to 66 percent—the employment rate would increase by 3.8 percent points, and the wages by 3.6 percent.

Impact of investment in education and language courses on the macroeconomy and public finances

Based on these estimates, we also simulate the effects of increased investment in the refugees' German language skills and academic qualifications on public finances and the macroeconomy. We base our calculations on the assumption that public investment in integration and language courses can increase the proportion of refugees with "good" or "very good" German skills by 20 percentage points within 10 years of immigration, which has been the case among other migrant groups. It is also assumed that the percentage of refugees with German degrees can likewise be increased by 20 percentage points compared to the baseline scenario characterized by the pre-2015 low level of investment.

These outcomes could be achieved, for example, through additional investment in general education and vocational training, including targeted support programs for refugees. Up to one third of all immigrants earn their first professional degrees in Germany. Both assumptions are therefore not unrealistic considering that in the past,

little was being invested in promoting language courses and academic qualifications, and because the 2015 refugees are younger than those of the previous cohorts and thus more likely to attend vocational schools or universities. Although the integration measures adopted in 2015 and 2016 go some way towards these investments, they alone are not sufficient for achieving these objectives.

Under these assumptions, investment in further academic and professional training will decrease the average annual fiscal costs by about 500 million euros compared to the baseline scenario over the course of the simulation period. The acquisition of German skills reduces the average annual costs by another 190 million euros, for a total reduction of 689 million euros (Table 6)—which means that the total cumulative fiscal costs would decrease by 11 billion euros by 2030. This figure includes an estimated investment of just under three billion euros in education and roughly 0.3 billion euros in language acquisition—in all, a total of just under 3.3 billion euros.²⁰

²⁰ When examining the increased efforts to raise education and qualification levels, we take into account the costs of integration courses, job-related language training, and investment in vocational training and academic studies; we set these values at 500 million euros in 2016 and 200 million euros in 2017. We also take into account the additional education expenditure that will be necessary in the long run. The total cost estimates are based on the assumption that only 60 percent of those who enroll in vocational or academic programs will actually obtain a degree; accordingly, we assume that 5,000 euros per person per year will be spent on one third of the refugees between the age 18 and 64 between 2016 and 2020. In the scenario with improved language proficiency, we assume that only 60 percent of the participants in language or integration courses will reach a level of B2, which corresponds to "good" or

Table 5

Employment and wage effects of the acquisition of German educational degrees and language proficiency of pre-2014 refugee cohorts

Effects are based on observations from the IAB-SOEP Migration Sample

Regression	Employment ¹			Hourly wage (log)		
	(1)	(2)	(3)	(4)	(5)	(6)
German vocational degree	0.198*** (0.057)	0.190*** (0.064)	0.183*** (0.066)	0.234** (0.095)	0.265** (0.113)	0.246** (0.110)
German language proficiency	0.188*** (0.049)	0.126** (0.053)	0.229*** (0.063)	0.181*** (0.069)	0.236*** (0.081)	0.144* (0.078)
German language proficiency before arrival	0.004 (0.079)	0.035 (0.097)	-0.041 (0.081)	0.076 (0.095)	0.070 (0.129)	0.023 (0.123)
Vocational degrees before arrival	0.077 (0.048)	0.051 (0.053)	0.009 (0.064)	-0.035 (0.066)	-0.077 (0.081)	-0.005 (0.077)
Gender (1 = female)	-0.235*** (0.040)	-0.192*** (0.047)	-0.280*** (0.054)	-0.238*** (0.066)	-0.265*** (0.080)	-0.310*** (0.086)
Age	0.044*** (0.011)	0.031** (0.014)	0.051*** (0.015)	0.045** (0.021)	0.057** (0.028)	0.041 (0.028)
Age squared	-0.000*** (0.000)	-0.000** (0.000)	-0.001*** (0.000)	-0.001** (0.000)	-0.000 (0.000)	-0.000 (0.000)
Years since arrival	0.017 (0.012)	0.014 (0.013)	0.012 (0.014)	0.002 (0.024)	-0.004 (0.030)	0.018 (0.033)
Years since arrival squared	-0.001* (0.000)	-0.001 (0.000)	-0.000 (0.000)	0.000 (0.001)	-0.000 (0.001)	-0.000 (0.001)
Employment before arrival		0.028 (0.065)			-0.117 (0.090)	
Work experience before arrival		0.022** (0.010)			-0.047*** (0.017)	
Work experience before arrival squared		-0.001** (0.000)			0.002*** (0.001)	
High grades in mathematics			0.012 (0.060)			0.086 (0.122)
High grades in foreign languages			0.075 (0.073)			0.101 (0.113)
Number of persons	465	463	243	251	223	151
Number of observations	751	463	455	376	223	256
R ²	0.26	0.25	0.30	0.32	0.42	0.32

¹ Employment is defined as dependent employment.

Notes: ***, **, and * are significant at the 1 percent, 5 percent, and 10 percent levels, respectively. Standard errors in brackets. Additional regressors are fixed effects related to the federal German state where the individual resides, fixed effects for the county of origin, and a dummy variable for wave II. The sample only includes individuals between the ages of 18 and 64 who came to Germany as refugees or asylum seekers.

Source: IAB-SOEP Migration Sample, waves I and II, authors' own calculations.

© DIW Berlin 2017

Conclusion

In this report, we analyze the fiscal and macroeconomic effects of increased investment in the labor market integration of the 2015 refugee cohort. We use a baseline scenario characterized by the refugee integration patterns prior to 2015, a time in which only a small amount was being invested in integration. Our policy scenarios simulate a situation in which a greater level of investment in education and language acquisition can increase the share of refugees with German academic qualifications, and “good” and “very good” German language skills, by 20 percentage points each. Because the integration measures adopted in 2015 and 2016 alone are unlikely achieve this goal, further investment will be necessary.

“very good” language skills in our regressions; when calculating the costs of language courses, we therefore assume that one third of immigrants aged 18 to 64 will participate in such a course between 2016 and 2018. According to the Federal Office for Migration and Refugees, the expenditure on these courses—including the administration of placement exams—averages out to 2,300 euros per person per year and per course. The cumulative expenditure over this period will thus amount to 312 million euros.

If the proportion of refugees who obtain a vocational qualification in Germany were to increase by 20 percent, the fiscal balance of the 2015 refugee migration would improve significantly: by 2030, the average deficit would be about 500 million euros less than that of the low-investment baseline scenario. If the share of refugees with “very good” and “good” German skills were to increase by 20 percentage points, the annual average fiscal deficit would shrink by another 190 million euros. By 2030, the cumulative fiscal costs would decrease by 11 billion euros. This figure includes an estimated investment of just under 3.3 billion euros.

This potential is also demonstrated in a recent IAB study²¹ that econometrically assesses the economic effects of immigration since 1970. Although refugee migration has had negative macroeconomic effects, this is not the case for immigration in general. If the current refugee cohorts

²¹ Enzo Weber and Roland Weigand, “Identifying macroeconomic effects of refugee migration to Germany,” Institute for Employment Research, Discussion Paper no. 20 (2016).

Table 6

Impact of investment in increased educational qualifications and language skills of the 2015 refugees on macroeconomic income and public finances

Compared to baseline scenario, billion euros

	2015	2016	2017	2020	2025	2030	Yearly average	as percent of GDP 2015	For information: Euros per inhabitant (yearly average)
Gross domestic product (GDP)	1	140	271	2,025	3,487	2,879	2,077	0.07	25
Net national income (factor costs)									
Total	1	91	176	1,303	2,240	1,830	1,331	0.04	16
after taxes and social contributions									
Total	0	53	104	783	1,344	1,086	795	0.03	10
Immigrants	0	7	15	382	874	785	508	0.02	1,161
Non-immigrants	0	46	89	401	470	301	287	0.01	4
Public finances									
Revenues									
Social contributions	0	28	52	364	610	491	361	0.01	4
Taxes	0	26	51	367	637	535	382	0.01	5
Expenditures	0	446	814	544	-242	-219	55	0.00	1
Fiscal balance	0	-391	-712	187	1,489	1,245	689	0.02	8

Source: authors' own calculations.

© DIW Berlin 2017

can obtain qualifications and integrate themselves into the labor market in the same way other migrants have done, more favorable macroeconomic effects could also be expected here.

By opening up the integration courses to all asylum seekers who are likely to remain in Germany for an extended period (based on the situation in their countries of origin), an important step has been taken toward increasing investment in refugees' language competence. At the same time, a significant portion of asylum seekers will remain without support until the completion of their asylum procedures, even though a considerable number of them will stay in Germany. Given the high returns and comparatively low costs, we should consider extending integration courses to all asylum seekers, not only those with a higher likelihood of remaining in Germany.

The Integration Act provides all asylum seekers and tolerated persons who take up vocational training in Germany with legal certainty for the duration of their studies; should they find employment, this support will be valid for another two years. This measure is also expected to stimulate investment in education. As well, schools and institutions of higher education, as well as businesses and houses of parliament, are currently making significant efforts to integrate refugees into the regular education and training courses. Given the high yields that would result from increased investment in education, we should consider providing even more support to help refugees transition to the German education and training system—for example, through investment in measures that support preparatory education and professional training.

Stefan Bach is a Research Associate in the Public Economics Department at DIW Berlin | sbach@diw.de

Herbert Brücker is Head of the International Comparisons and European Integration Research Department at IAB | herbert.bruecker@iab.de

Peter Haan is Head of the Public Economics Department at DIW Berlin | phaan@diw.de

Agnese Romiti is a Senior Researcher in the International Comparisons and European Integration Research Department at IAB | agnese.romiti@iab.de

Kristina van Deuverden is a Research Associate in the Forecasting and Economic Policy Department at DIW Berlin | kvandeuverden@diw.de

Enzo Weber is Head of the Forecasts and Structural Analyses Department at IAB | enzo.weber@iab.de

JEL: F22, I21, H52

Keywords: Refugees, migration, labor market integration, budget impact.



DIW Berlin – Deutsches Institut
für Wirtschaftsforschung e.V.
Mohrenstraße 58, 10117 Berlin
T +49 30 897 89 -0
F +49 30 897 89 -200

Publishers

Prof. Dr. Tomaso Duso
Dr. Ferdinand Fichtner
Prof. Marcel Fratzscher, Ph.D.
Prof. Dr. Peter Haan
Prof. Dr. Claudia Kemfert
Prof. Dr. Lukas Menkhoff
Prof. Johanna Möllerström, Ph.D.
Prof. Karsten Neuhoff, Ph.D.
Prof. Dr. Jürgen Schupp
Prof. Dr. C. Katharina Spieß
Prof. Dr. Gert G. Wagner

Reviewer

Simon Junker

Editors in chief

Dr. Critje Hartmann
Dr. Wolf-Peter Schill

Editorial staff

Renate Bogdanovic
Dr. Franziska Bremus
Prof. Dr. Christian Dreger
Sebastian Kollmann
Ilka Müller
Mathilde Richter
Miranda Siegel
Dr. Alexander Zerrahn

Layout and Composition

eScriptum GmbH & Co KG, Berlin

Sale and distribution

DIW Berlin
ISSN 2192-7219

Reprint and further distribution—including excerpts—with complete reference and consignment of a specimen copy to DIW Berlin's Communications Department (kundenservice@diw.berlin) only.
Printed on 100% recycled paper.