Refugee Immigration and its Effects on German Markets

Aida González-Mellado, Martin Banse und Petra Salamon

Thünen Institute of Market Analysis, Braunschweig, Germany

1. Introduction

According to the United Nation Refugee Agency, it is estimated for 2015 a track worldwide of forced displacement exceeding 60 million. For the first time the number of forcibly displaced people is the highest level of people displaced since World War II (UNHCR, 2015). Among them, Syrian refugees became the largest refugee group since 2014 (3.9 million in 2014, and 4.2 million by mid-2015), replacing Afghanistan as the main country of origin of refugees worldwide, as Afghan refugees had been the largest refugee group for three decades. Even though most Syrian refugees were hosted by neighboring countries such as Turkey, Lebanon and Jordan, the number of Syrian refugees applying for asylum in Europe steadily increased between 2011 and 2015. One has to consider that the statistical picture with respect to the number of people seeking international protection in Europe is partially distorted because the same individual might be registered as asylum-seeker multiple times across the continent (UNHCR, 2015).

In 2015 Germany has become the most sought-after final destination among the EU migrants. Approximately nine hundred thousand migrants have continued to pour into Germany as of 20 December 2015. From the migrants entering into Germany, approximately 500 000 have already been registered and requested asylum as of 30. December 2015 (Ministry of Foreign Affairs, 2015). The right of asylum is not only anchored in the 1951 Geneva Convention on Refugees; in Germany, it is also enshrined in the Constitution as a fundamental right, the one unique fundamental right which is applicable only to foreigners. Asylum law has, thus, a special priority in Germany (Ministry of Foreign Affairs, 2015).

A preliminary study on the economic impacts of the 2015 refugee inflow suggests that they are positive (DIW, 2015). Germany's additional spending on housing and feeding of refugees in the first years will be overtaken by the gains in returns by the additional labor force in subsequent years. A preliminary study run by Fratzscher and Junker (DIW, 2015) considered a partial integration of migrants into the labor market in Germany in the coming 10 years.

Our paper focuses on the effects of the increasing demand for agricultural products and their effects on agricultural and non-agricultural markets as well as on German economy. Based on the Thünen Baseline 2015-2025 (Thünen Institute, 2016) for Germany an increase in the population and respective changes in consumption brought on by the migrants are regarded. The scenario assesses production reactions due to changes in demand. In a second scenario, expected changes in the labor markets by adopting labor integration patterns observed in the mid-90s from the refugees' inflows into Germany are added to Scenario 1 analyzing effects on GDP, agricultural markets and labor markets in Germany. The remaining structure of the paper is as follows. Section 2 reviews historical trends of foreigners in Germany. Section 3 describes the AGMEMOD-MAGNET linkages, as well as the underlying assumptions of the simulated scenarios. Section 4 shows some results obtained regarding changes in commodity balances, market prices and in labor markets in Germany. Section 5 contains the discussion of the results and finally section 6 concludes the paper.

2. Foreigners in Germany

2.1. German migrants

According to the Foreigner Register Centre, in 2014 approximately 8.15 Mio German residents were foreigners. Table 1 shows the main Nationalities from the foreigners[1] living in Germany. and possessing a valid resident permit in percent from 2007 to 2014.

Table 1: Foreigners living in Germany in percent by nationality from 2007 to 2014

Origin	2007	2008	2009	2010	2011	2012	2013	2014
Europa	**79.71**	**79.71**	**79.58**	**79.58**	**79.49**	**79.39**	**79.28**	**78.44**
EU-28	*37.99*	*38.42*	*38.67*	*39.44*	*40.72*	*42.29*	*44.10*	*45.04*
EU-Candidate States	*33.48*	*32.59*	*31.44*	*30.43*	*28.83*	*27.14*	*25.36*	*23.81*
Albania	0.15	0.15	0.15	0.15	0.15	0.16	0.18	0.29
Iceland	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Mazedonia	0.93	0.93	0.94	0.98	0.97	1.01	1.02	1.03
Montenegro [1]	0.04	0.09	0.15	0.19	0.22	0.23	0.22	0.23
Serbia [1] (with and without Kosovo)	1.36	2.02	2.46	2.65	2.86	2.81	2.69	2.71
former Serbia and Montenegro [1]	3.51	2.64	1.84	1.38	0.79	0.55	0.48	0.39
Turkey	25.41	25.10	24.77	24.13	23.19	21.84	20.30	18.73
Other European countries	*7.59*	*8.05*	*8.82*	*9.07*	*9.30*	*9.34*	*9.23*	*9.02*
Bosnia und Herzegovina	2.34	2.33	2.31	2.26	2.21	2.15	2.06	2.01
Kosovo [1]	0.00	0.48	1.26	1.61	1.98	2.18	2.24	2.26
Moldau	0.18	0.18	0.18	0.18	0.17	0.16	0.15	0.15
Russia	2.78	2.80	2.83	2.83	2.82	2.80	2.83	2.72
Ukraine	1.88	1.88	1.88	1.84	1.78	1.71	1.60	1.57
Belarus	0.27	0.27	0.28	0.28	0.28	0.27	0.26	0.25
North Africa	1.77	1.75	1.74	1.72	1.70	1.70	1.76	1.78
West Africa	1.01	1.02	1.05	1.05	1.06	1.07	1.13	1.20
Central Africa	0.46	0.46	0.46	0.45	0.44	0.43	0.42	0.42
Eastern Africa	0.51	0.51	0.53	0.57	0.57	0.58	0.66	0.87
Southern Africa	0.24	0.23	0.23	0.22	0.22	0.21	0.20	0.19
North America	1.68	1.69	1.66	1.64	1.67	1.66	1.61	1.53
South America	0.44	0.45	0.45	0.45	0.46	0.46	0.45	0.45
Irak	1.07	1.08	1.10	1.09	1.10	1.10	1.07	1.04
Iran	1.08	1.11	1.19	1.20	1.19	1.17	1.12	1.09
India	0.83	0.81	0.78	0.77	0.78	0.79	0.80	0.77
Thailand	0.63	0.66	0.68	0.71	0.77	0.84	0.88	0.93
Vietnam	0.80	0.81	0.83	0.83	0.82	0.80	0.77	0.72
Afghanistan	0.74	0.72	0.72	0.76	0.84	0.92	0.99	1.12
China	1.16	1.17	1.18	1.21	1.28	1.39	1.50	1.64
Japan	0.45	0.45	0.44	0.43	0.47	0.49	0.50	0.51
Kazakhstan	0.82	0.80	0.78	0.76	0.73	0.71	0.70	0.69
Korea	0.35	0.35	0.35	0.35	0.37	0.38	0.40	0.42
Oceania	0.16	0.17	0.17	0.18	0.19	0.20	0.21	0.22
Australia	0.13	0.13	0.13	0.14	0.15	0.16	0.16	0.17
Other Status	0.93	0.92	0.90	0.88	0.85	0.83	0.77	0.87
no nationality	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.22
Unclear	0.73	0.71	0.70	0.68	0.65	0.63	0.57	0.64
Sub-total	94.85	94.86	94.80	94.86	94.98	95.12	95.22	94.90

Source: German Federal Statistical Office (Bevölkerung und Erwerbstätigkeit, 2014).

[1] Ethnic German immigrants are ethnic Germans from the succeeding states of the former Soviet Union and from other Eastern European countries.

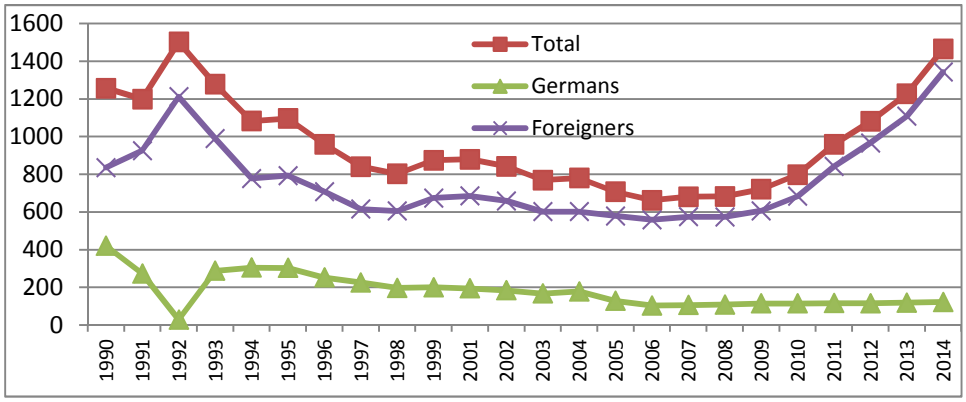
Almost the half of them comes from one of the other 27 EU Member States (45.04%). The largest immigrant group by 18.7% of the total foreigners living in Germany consists of Turkish citizens.

After 20 years of significant inflows of refugees from the former Yugoslav Republic, mostly observed in the 90s, nationals from succeeding states to the former Yugoslav Republic (SSFY) (Kosovo, Montenegro, Serbia, Croatia and Bosnia and Herzegovina) represent approximately 9% of the foreigners. Another large group is constituted by Russian citizens who represent almost 3% of the total foreign population in Germany.

2.1.1. Historical trends

Presenting yearly inflows into Germany in Graph 1, it appears that inflows can be subdivided into two groups: immigrants who are ethnic German immigrants[2] and foreign citizens. Ethnic German immigrants mostly arrived in the 80s and mid-90s, while their arrivals since 2005 have remained steady annual inflow by approximately 100 000 ethnic German immigrants (BAMF, 2014).

Graph 1. Inflow developments into Germany from 1990 to 2014.



Source: own design with data from BAMF (2016) and BAMF (2014).

In contrast, inflow from foreigners appear to develop more dynamic than the inflow of ethnic German immigrants. Trends to be observed in Graph 1 are driven by diverse historical events. Until the mid-90s refugees were the most prominent group. Especially in the period between 1991 and 1995 approximately 1.3 Mio refugees from the former Yugoslavian region arrived in Germany while in 2014 only approximately 0.7 Mio citizens from SSFY lived in Germany (BAMF, 2014), indicating that either a considerable number of people who had arrived from former Yugoslavia in the 90s have either left Germany or become German citizens through naturalization.

From 1998 to 2008 there was a constant inflow into Germany, while from 2009 to 2014 onwards a relatively stable annual number of immigrants has been registered. From 2009 onwards the number of immigrants has steeply increased. In 2014 the inflow reached 1.46 Mio entering into Germany of which 1.34 Mio have been foreigners. Expected official numbers for 2015 have still not become available, but the preliminary estimate indicate a total inflow of around 1.5 Mio applicants for asylum. Thus, in 2015 the number of foreigners will be the highest registered in Germany since 1994 (Ministry of Interior, 2016).

[2] Ethnic German immigrants are ethnic Germans from the succeeding states of the former Soviet Union and from other Eastern European countries.

2.1.2. Current inflow trends

While migration trends of European citizens have barely changed since the early 90ies or have even started to decline, most of the additional inflows from 2009 onwards consist of non-European citizens fleeing from conflict areas. Table 2 presents the number of first-time asylum applicants registered by the German authorities between January 2013 to February 2016. During that period the number of requests for refugee increased by 60%. A continuous decline in the numbers of asylum seekers from SSFY can be observed from 2013 onwards and likely be perpetuated in 2016 which is driven by the fact that some SSFY countries were declared safe countries of origin in October 2015 (BAMF, 2015).

A main driver for the large increasing inflows into Germany is the rising number of people fleeing from political and social conflicts in Syria. During 2015, the majority of first-time asylum applicants registered as from Syria (35%). In January and February 2016 the number of Syrian refugees accounted for 158 657 people, being higher than the number of refugees from all regions entering into Germany from 2009 to 2011: 135 000 refugees (BAMF, 2014).

Table 2: Current official refugee requests in Germany (2013-2016)

Year	Total Official Refugee requests	% Refugees from		
		SSFY*	Syria	Eritrea
2013	109580	14.5	10.8	3.3
2014	173072	12.9	22.7	7.6
2015	441899	5.8	35.9	2.5
Jan-Feb 2016	116659	7.3	60.4	2.2

Source: own design with data from BAMF (2016) and BAMF (2014).
* SSFY: successor States to the former Yugoslav Republic (Kosovo, Montenegro, Serbia, Croatia and Bosnia and Herzegovina).

Figures mentioned here are on refugees registered by the BAMF. Additionally to the BAMF, the EASY (Erstverteilung von Asylbegehrenden) System has collected information on about 1.1 Mio refugees (Ministry of Interior, 2016). Although high numbers of asylum seekers are expected to arrive in Germany in 2016, precise estimates are difficult to achieve for many reasons; as e.g. the future development of the situation in Syria will be unpredictable.

To simulate economic impacts of the refugees inflow on German agri-food and labor markets some data is required which is difficult to be obtained. In general, data on this subject is scarce. Thus, the paper will be based on assumptions of empirical developments on the integration of foreigners and especially of refugees in the German labor markets derived from the past.

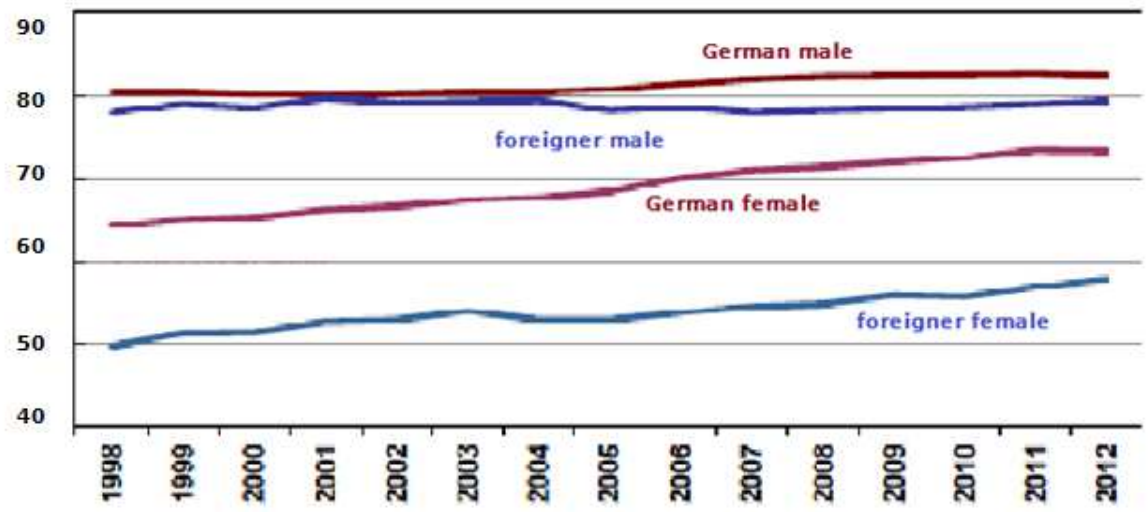
2.1.3. Integration of foreigners in German labor markets

The Report “Migrants in the German Labor Market” published by the Federal Office for Migration and Refugees (2011) provides a differentiated analysis of historical trends by age, gender and origin of foreign-born residents. Graph 2 depicts the labor force participation rate of females and males with and without migration background. Comparing people with and without migration background it becomes evident that foreign-born residents have a lower participation rate in German labor markets than native-born citizens.

In relative terms foreign-born residents also have on average a lower level of education compared to German citizens (BAMF, 2011). As a consequence, foreign-born residents are engaged typically in low-skilled activities such as: part-time jobs, marginal employment, shift work, weekends- and

holiday-jobs etc.[3]. The analysis of foreign-born residents' participation by industry is presented in Graph 3. Industries respective services with high participation rates of foreign-born residents are catering and hotel industry (26.6%), labor leasing (20.2%), other economic services (17.2) and agricultural and fishery activities (16.6%) in contrast to industries and services with comparative low participation rates of foreign-born citizens such as public administration and safety (2.3), financial services (3%) and mining, energy and water services (4.3%).

Graph 2. Labour force participation rate of Germans and foreigners by gender



Source: Statistik der Bundesagentur für Arbeit (2014)

According to the Report "Migrants in the German Labor Market" certain groups depict more positive results with respect to integration in the German labor market. As example, German country-born offspring of foreigners, especially among young women tend to have similar occupational working profiles than those observed by German citizens without migration background (BAMF, 2011). Additionally, distinct foreigner groups have been identified, for example the ethnic German immigrants and women with Greek and Croatian migration background, to show a relatively better labor market integration than other foreigner groups (BAMF, 2011). Contrasting, the Report mentioned women from Turkey and female offspring with Turkish migrant background to have a high unemployment rate and the lowest salaries amongst foreigners in Germany. Possible explanations for these observations, is not the country of origin per se, but the level of education attained, especially in the case of immigrants who arrived into Germany at an adult age (Institut für Sozialforschung und Gesellschaftspolitik, 2009).

1.1.1. Integration of refugees in the German labor market

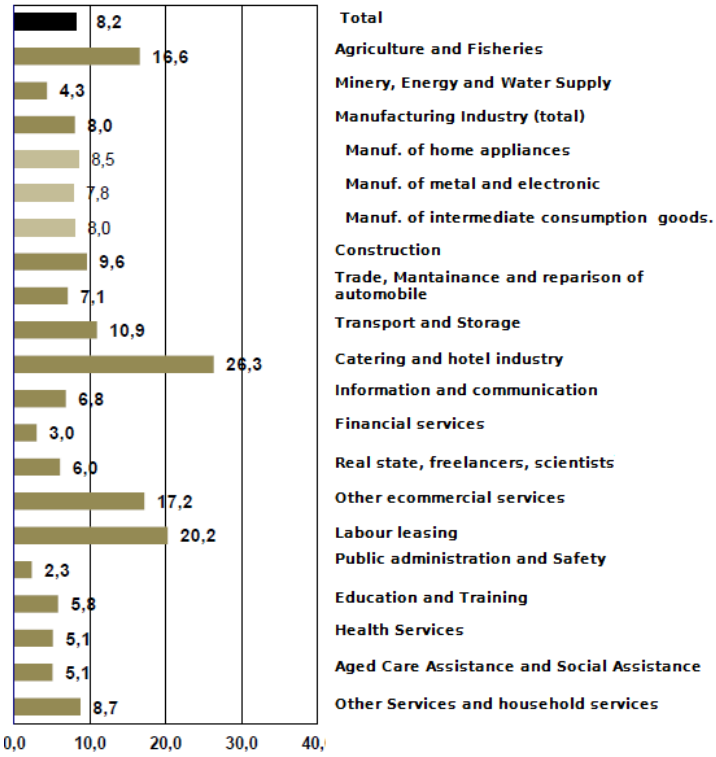
The medium-term prospects of the labor market integration of refugees currently can be estimated only with difficulty. The IAB-SOEP[4] migration sample was analyzed to gain information on people who have come to Germany as refugees and their integration process into the labor market (IAB, 2015). Regarding the education level, refugees in the past arriving in Germany depicted similar education level than refugees currently arriving in Germany. However, in the past the legal and institutional

[3] Employments with a low level of earnings or employments of short duration.

[4] The IAB-SOEP sample contains information collected by surveys from 5000 people with migration background. The focus of the sample lies on migrants who arrived after 1995 into Germany and their offspring as well as the procedure of integration into the labor market since 1995 (IAB, 2015).

framework had not been designed to face such challenges as at the moment. With this premise, it can be expected that a quicker integration of refugees into the labor market compared to the past will take place (IAB, 2015). Nonetheless, the integration of refugees into the labor market will take time. In the year of arrival, only 8% of the refugees aged between 15 and 64 years old found a fitting job opportunity. After five years in Germany, the ratio rose to nearly 50 %, and after ten years at 60 % (IAB, 2015).

Graph 3. Employment of foreigners in Germany by industry



Source: Statistik der Bundesagentur für Arbeit (2014)

The structure of salaries earned might be regarded as an indicator of qualification. Refugees who start working in the first year after their arrival earned around 1100 euros per month, ten years thereafter their earning was about 1,500 euros, after 15 years and more it reached up to 1600-1700 euros. For the future, a faster integration of refugees into the labor market is expected than in the past as the result of an improved legal and institutional framework as well as language training, more effective education and additional training programs (IAB, 2015).

1.2. Consumption patterns of incoming refugees

As seen described in section 2.3, the largest current inflow of asylum applicants in Germany comes from Syria followed by people from Afghanistan and Eritrea. Given that more than 60% of the expected refugees for 2016 and 2017 will arrive from Syria, in the section the consumption pattern of Syrian consumers in a 2007 were regarded. FAO data from 2007 may appear quite old; however, that year was selected, because it represents a year of economic and social stability in Syria. As cultural backgrounds and habits are next to economic factors major influencing determinant affection per capita consumption we assumed that refugees from Syria will follow the consumption pattern per capita of 2007 after their arrival in Germany. Similarly migrants from Afghanistan, Pakistan, Eritrea

and Serbia will follow the consumption pattern of their native country; however, for those migrants per capita consumption of the year 2011 were applied.

Annual consumption of agri-food products per capita is presented in Table 3 for Syria and Germany. According to FAO figures, Syrians consume a higher amount of vegetables than Germans. The most important cereal crop consumed by Syrians is wheat followed by maize. Only in the case of potatoes Germans appear to have a higher consumption than Syrians.

Table 3. Average annual food consumption of Germans and Syrians, (per capita, in kg).

Vegetable products		
Food product	**Syria**	**Germany**
Wheat and products	154.30	85.40
Rice	10.80	3.00
Barley and products		0.30
Maize and products	5.30	9.70
Rye and products		10.20
Millet and products	0.10	0.10
Potatoes and products	21.60	70.70
Sugar (Raw Equivalent)	45.50	36.90
Vegetables	103.30	94.30
Fruits	91.60	80.40

Animal products		
Food product	**Syria**	**Germany**
Meat	23.60	87.90
Bovine Meat	3.40	13.40
Mutton & Goat Meat	11.00	0.90
Pork meat		53.50
Poultry Meat	9.10	18.00
Butter, Ghee	1.60	5.50
Eggs	7.20	12.80
Milk	116.60	255.40
Fish, Seafood	3.10	14.20

Source: FAO Country Balance Sheets; Germany 2011, Syria 2007.

With respect to animal products, Germans consume higher amounts than Syrians, only in the case of sheep and goat meat, the consumption per Kg and per capita of Syrians with 11 kg per capita and year is considerably higher than by Germans. Germans consume a considerable amount of pork meat with about 53.5 kg per capita and year, while most of the refugees from Syria have stated to be Muslim. The Muslim religious tradition advices some dietary rules to be followed. Amongst different food product, the consumption of pork meat is prohibited, this explains the low consumption of pork in Syria. Different consumption patterns will be further addressed in the scenario descriptions, as they serve as basis for assumptions on consumption patterns followed by increasing numbers of refugees from Syrian, Pakistan, Afghanistan and Eritrea in Germany.

2. Model Approaches and Scenarios

As starting point results obtained from the models MAGNET and AGMEMOD under the Thünen-Baseline 2015-2025 (Offermann et al. 2016) are used. The Thünen Baseline is developed every two years by the Thünen Institute and is used for further policy analysis for the German Ministry of Food and Agriculture and provides a medium-term outlook on the development of the German agricultural sector with respect to prices, production, agricultural trade, income and environmental impacts. The projection used in the Thünen Baseline cover 10 years. The Baseline assumes a continuation of the current policy framework and the implementation of already decided policy changes. For the Thünen-Baseline 2015-2025, this implies the implementation of the EU-CAP reform decided in 2013 and its national implementation according to the decisions made at the German Ministers of Agriculture conference. The Thünen-Baseline employs external sources for the assumptions on macroeconomic developments such as GDP growth (USDA), exchange rates (OECD-FAO), world oil prices (OECD-FAO), population growth (USDA), etc. For further see Offermann et al, (2016).

The Thünen-Baseline utilizes a number of different models to come up with aligned projections of the German agricultural sector. Within the Thünen model platform AGMEMOD and MAGNET use a set of macro-economic and policy variables harmonized across all other models of the platform. Following the modelling approaches will be described.

2.1. AGMEMOD

AGMEMOD (Agricultural Member States Modelling) is a partial multinational multi-product model with generally econometrically estimated parameters and recursive-dynamic approach for each country included. The model for Germany has 20 agricultural sectors and 17 processing sectors. Similar models are available for other EU Member States, candidate and other neighboring countries. AGMEMOD is applied to create medium and long-term market projections of EU Member States and based on the simulation of market policies according to the Common Agricultural policies of the EU. For the considered sectors production, consumption, trade, stocks, prices and often the processing are analyzed (Erjavec et al., 2007; Van Leeuwen et al., 2007a; Van Leeuwen et al., 2007b; Salputra et al., 2008; Chantreuil et al. 2011, AGMEMOD partnership, 2010, AGMEMOD partnership, 2012). In AGMEMOD, a flexible, modular bottom up approach is used. Econometric based, recursive-dynamic country specific modules have been developed to reflect details of agriculture at country levels. Various domestic commodity markets are linked by substitution or complementary conditions in supply and demand, covering differentiated types like demand for food, feed, energy use or further processing. All supply and utilization of a distinct commodity are balanced via the world market clearing. These sub-models also include a detailed set of agricultural, trade policy or other policy instruments in each MS. Production, supply and use items are driven by exogenous variables like productivity, technical coefficients, prices, macro-economic variables, policy variables as well as endogenous variables. Within the Thünen model platform AGMEMOD uses a set of macro-economic and policy variables harmonized across all other models of the platform.

2.2. MAGNET

The Modular Applied GeNeral Equilibrium Tool, MAGNET, is a global computable general equilibrium model. A distinguishing feature of the model is its modular design. Modularity allows modellers to tailor the model structure to fit the research question at hand. MAGNET is based on the LEITAP model, which has been used extensively in policy analyses. MAGNET offers more flexibility in model aggregation (definition of regions and sectors) and more options for changing a model's structure. The standard GTAP model (Version 6.2 of September 2003) was the starting point for developing MAGNET. GTAP is a general equilibrium model covering all sectors of the economy (agriculture, manufacturing and services) in contrast to AGMEMOD which only focuses on agricultural sectors. GTAP is a global model, covering all regions and major countries in the world. A region may include several countries for which there is no individual country data. In MAGNET as well as in GTAP the regional household supplies factors (land, skilled and unskilled labour, capital and natural resources) to the production sectors. In the area of factor markets modeling, the segmentation and imperfect mobility between agriculture and non-agriculture labor and capital was introduced, i.e. the version of MAGNET applied for this paper separates agriculture and non-agriculture labor markets which lead to different wage developments for skilled and unskilled workers employed in agriculture or outside agriculture.

By combining these factors with intermediate inputs from other sectors, commodities are produced. Produced commodities are either supplied to domestic markets to satisfy the demand for commodities by private households and governments or they are exported. For further description of the MAGNET module please see Annex A or consult Woltjer G., and Kuiper M., (2014).

2.3. Linkage and simulations

The model linkage employed in the simulations comprised several steps which are the following

- Step 1: Change in population due to migration and application of agri-food consumption pattern for the inflowing population has been introduced to AGMEMOD to generate changes in production of agri-food products in AGMEMOD.
- Step 2: The potential macro-economic impact of additional consumption in the non-food sectors according to the inflow of migrants and the effects of the integration of inflowing migrants on the labor markets were studied based on the MAGNET model. Two different scenarios have been applied in MAGNET: In the first simulation focusses on the impact of additional consumption without integration of migrants in the German labor markets (Scenario Pop), in a second scenario a delayed and imperfect integration in the German labor market have been simulated based on statistical data described above.

Because AGMEMOD is partial equilibrium model the input of MAGNET was applied as a change in the assumptions and in change in the per capita consumption.

In MAGNET the inflow of population and the stepwise integration induced macro-economic effects which are analyzed in separate scenarios.

In total the following scenarios were conducted:

- Scenario Baseline consistent with the Thünen-Baseline (2015-2025);
- Scenario MigrantCon including past consumption patterns for migrants (2015-2017); and on top of that
    - Scenario Pop in which the additional population will not be integrated in the labor force in the periods 2010-2015, 2015-2020, and 2020-2025;
    - Scenario PopLab in which the additional population will be integrated in the labor force in different degrees in the periods 2010-2015, 2015-2020, and 2020-2025.
    - .

2.3.1. Scenario Baseline

The Baseline depicts an annual growth of the global economy of 3.4 % and 1.6% within Germany. World population growth is to increase by 1 % p.a., while the population in Germany is slightly declining by -0.2 % p.a. (USDA 2014a, 2014b). The Euro is expected to remain relatively weak at an exchange rate of 1.15 $/€ in 2025 (OECD-FAO, 2015). Inflation in Germany will remain low at 1.6 % p.a. For energy inputs, the oil price projections used in the OECD-FAO-outlook (2015) are applied with an oil price of 88 $/barrel in 2025. World market price projections for agricultural products from the OECD-FAO (2015) are used to calibrate world market price development of the AGMEMOD model. For the projection period international prices for livestock products, expressed in Euro, will rise further (+ 10 %- + 30 %) despite the downswing observed during 2011-2014, whereas world market prices for crop products remain constant or decrease slightly (Offermann et al. 2016).

With respect to the policy framework, the Baseline implies a direct payment system as established by EU-Regulation 1307/2013 and its national implementation (BMEL, 2015) will be continued until the year 2025. Some important policy assumptions can be found below, for further details, please consult Offermann et al, (2016).

- The Baseline accounts for 14 trade agreements which will be implemented by the EU and its trading partners between 2015 and 2025 (e.g., with countries in South America and North Africa and the Balkan States).

- EU regulation No. 1308/2013 foresees a safety net with public intervention mechanisms for selected products and reserve fund for crisis prevention and management measures exists to counterbalance general market disturbances. The Baseline presumes that no of the measures will be applied. The Baseline takes into consideration the abolishment of the milk quota in 2015 and the end of the quota regime in 2017 while maintaining border protection.
- With respect to the direct payments of the first CAP pillar a redistribution of funds between EU member states, the national redistribution of 4.5% of the budget to the second pillar, and support for young farmers lead to a base payment of 176 €/ha and a greening payment of 85 €/ha are foreseen. To support smaller farms, a top-up is granted of 50 €/ha for the first 30 ha and 30 €/ha for the next 16 ha.
- With the exception of Germany, all EU member states notified voluntary payment plans. Based hereon, 10.5% of overall direct payments in the EU-28 are coupled to production levels.
- Eligibility for a part of the direct payments depends on the fulfilment of the so-called 'greening' requirements covering protection of permanent grasslands, minimum crop diversity and provision of ecological focus areas (EFA). The share of EFA will remain fixed at 5 % of arable area.
- Taking into account the projections for fuel demand, it is expected that the new policy framework will reduce demand for biofuels until 2015, with only a modest increase in the following years.

2.3.2. Scenario MigrantCon (Migrants' consumption)

In the Step 1 effects of the population inflow to Germany for agri-food production are simulated. Figures applied in the simulation are to be found in Table 4. For the years 2015, 2016, and 2017 inflows of migrants are assumed which differ from year to year, but are the same across all simulations. The highest inflow is assumed for the year 2016 with nearly 1.3 million refugees abating to 546 000 migrants in the year 2017. In addition a change in the ethnic composition is expected. While in the year 2015 the share of people originating from Syria will only reach about 36 %, an further increase to around 60 % is simulated.

The inwards bound refugees will take along their consumption pattern embossed by religion, culture, and habits which divert from the ethnic German population's consumption. So, in principle, the addition population will depict a different consumption and the total consumption composition will face slight increases, but different from an increase by an ethic German population. Respective changes have been calculated based on past consumption pattern of the four major shares groups migrating to Germany. In principle, some increases for crop products are calculated which are especially significant for oils (see Table 4). Relatively marked is the increase in the demand for sheep meat, poultry and eggs while the increase in milk and dairy is below the average.

2.3.3. Scenarios migrants' inflow (Scenario Pop) and migrants' integration in the labor force(Scenario PopLab)

In the further work two scenarios are considered all based on the same outcome of migrants' inflow and their respective consumption pattern. Under one of the two scenarios (Pop) no integration in the German labor force is assumed, only an inflow of migrants of different ethnic backgrounds. Basic expenditures to cover living cost of migrants will be covered under the Scenario by the government (regional household). Basic assumptions on inflows considered can be found in Table 5.

Under the Scenario PopLab, the same migrants' inflow than under Scenario Pop will be simulated, but migrants will be integrated in the labor force by shares observed in the past. It is assumed that

migrants under age will receive education in Germany and, thus, will be integrated more easily into the labor force than the older adults. Therefore, the share of integration will increase over time. The share is expected to reach 63% in 2020 and 74% in 2025.

Table 4. Changes integrated into AGMEMOD for the three scenarios simulated.

		2015	2016	2017
Refugees' inflow	*Total number of migrants*	*941,900*	*1,166,600*	*546,600*
	Share (%) Syria	35.90	60.40	60.40
	Afghanistan	6.50	5.50	5.50
	Eritrea	2.50	2.20	2.20
	Serbia	5.80	3.30	3.30
Use change (%)	Wheat and products	0.38	0.71	0.33
	Maize and products	0.04	0.07	0.03
	Soybean oil	0.18	0.37	0.17
	Sunflower oil	0.53	1.01	0.47
	Bovine meat	0.18	0.32	0.15
	Sheep and goat meat	5.97	11.12	4.69
	Poultry meat	0.24	0.48	0.22
	Butter	0.01	0.03	0.01
	Eggs	0.25	0.50	0.23
	Milk	0.06	0.11	0.05

Source: own design.

Table 5. Assumed changes in the labor force considered in MAGNET.

	Thünen Baseline	*2015*	*2020*	*2025*
Changes in population (%)	-0.2	3.2	3.2	3.2
Total employment rate of migrants (%)	-		63	74

Source: own design.

3. Results

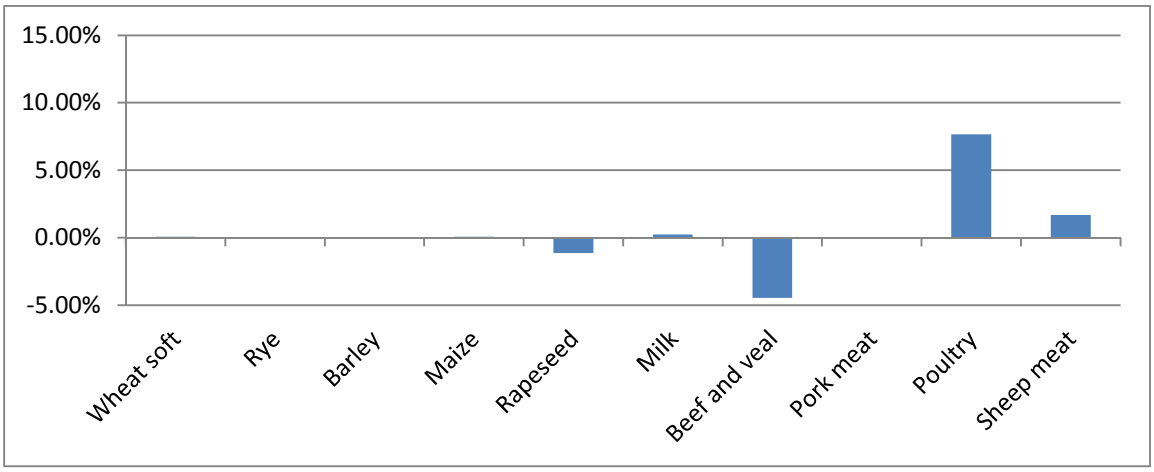
3.1. Effects on agricultural markets

Impact on the German agri-food markets will be driven by increases in the domestic consumption of major food products. In principle the additional population due to migrants will lead to higher domestic consumption, higher domestic prices and a higher production as well as to higher imports and lower exports. Results presented here are changes compared to the Baseline simulation which outcomes are not detailed in the following to keep the space at bay. In case of interest, please have a look at Offermann et al. 2016.

Although migrants will consume in general more crops respectively crop products than Germans the impact on the sector in general, will be quite limited. In this respect one has to consider that next to human consumption, a significant share of the domestic use is disposed as feed, energy or input for further production. Price effects in the cereal sector will be very considerate with simulated changes of way under 1% as the production will adjust accordingly (see Graph 4). Indeed, the increase in consumption will induce via prices a higher production of cereals in Germany. Impacts will be manageable in size with simulated changes below 1%.

Though agricultural area available is limited, the production of rapeseed will decrease to make off for area increases. To a marginal degree, rapeseed is directly utilized; in general it is processed further to oil mostly for energy purposes and meal as animal feed. Although to certain degree rape oil is also sold for human consumption rape oil is not a favorite cooking oil consumed by migrants. Prices for rape will decrease in general.

Graph 4. Changes in Production of Agri-food Products 2017

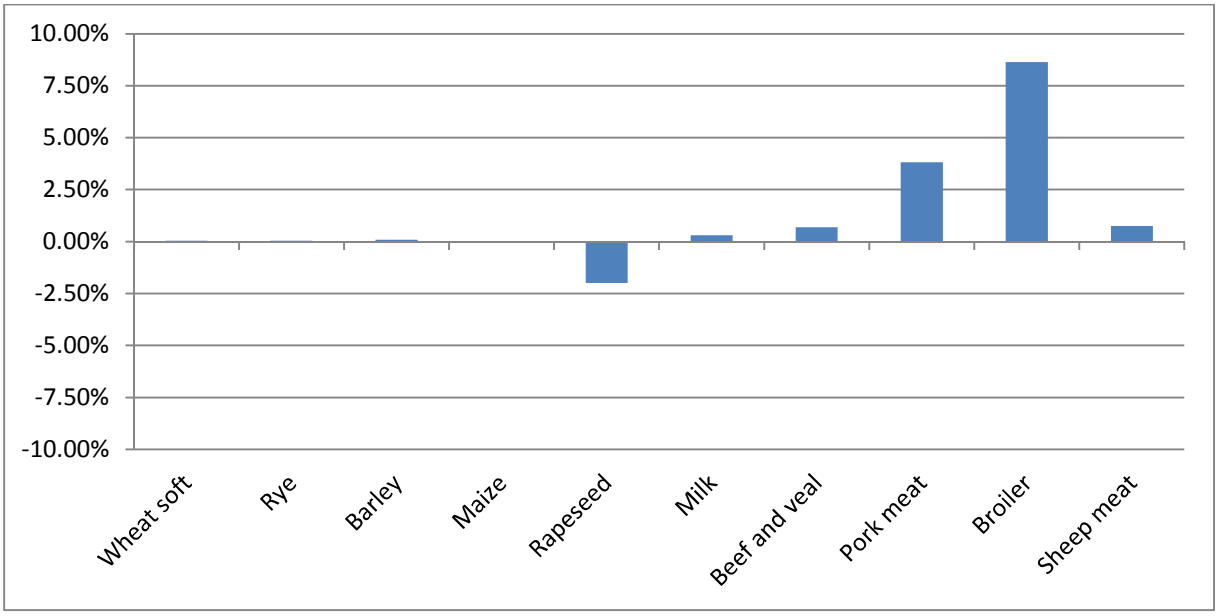


Source: Own simulation based on AGMEMOD.

Price and production effects will be higher in the animal sectors, contrasting the lower consumption of meat and dairy products of migrants usual consumption pattern, indicating some backlog demand will be released (see Graph 5). In general, impacts on German production are quite mixed. Demand pull on sheep and goat meat will exhibit some production growth with around 2 %. But share of sheep and goat meat in total meat production is low and sheep meat is quite expensive compared to other meats in Germany with a price more than double in contrast to the cheapest meat. Additional demand will also be covered by increasing imports.

So, instead of depicting growth in sheep meat more significantly migrants will turn to cheaper poultry which will be display more markedly growth than sheep meat and in addition a significant price increase. Although pork will be not consumed by migrants pork production will be expanded reflecting the price rise with pork as the current German population will increase their consumption slightly, which in turn will lead to some price increases as well. Beef will be crowded out to a certain extent while milk production will not change much.

Graph 5. Changes in Prices of Agri-food Products 2017



Source: Own simulation based on AGMEMOD.

3.2. Effects on labor markets

Additional consumption induced by an increase of population and the integration of migrants into the German labor market will create macro-economic effects which are analyzed based on the MAGNET model. Table 6 describes the major changes in the two scenarios, under Scenario Pop the negative trend in German population assumed under the Baseline scenario turns from a population decline to an increase in total population.

Table 6. Change in GDP due to an increase in population and labor work force in Germany, relative to Baseline, in percent

	2020	*2025*
Scenario Pop	0.003	0.005
Scenario PopLab	1.3	1.4

Source: Own simulation based on MAGNET.

The increase in GDP is almost negligible under the Scenario Pop. However, the (partial) integration of migrants into the German labor markets has a strong effect on total GDP with a GDP higher than 1.4 percent relative to the Baseline.

The integration of migrants in the German labor market will create additional jobs in different sectors of the German economy. The following Table 7 illustrates the change in the German job markets due to an increase in employment. It should be mentioned that these scenarios are based on the assumption of flexible wage rates for labor markets.

Table 7. Change in employment in Germany, relative to Baseline, in percent

		2020	2025
Industries	Scenario Pop	0.0	0.0
	Scenario PopLab	1.8	1.9
Services	Scenario Pop	0.0	0.0
	Scenario PopLab	2.5	2.6
Agriculture	Scenario Pop	0.2	0.2
	Scenario PopLab	1.8	1.7

Source: Own simulation based on MAGNET.

The simulation results for the employment indicate – as already described for GDP changes – only a small change for the scenario Pop. The integration of the additional inflow of workers will create in all sectors of the economy with a strongest shift in the service sector. Here one can assume that additional low-wage jobs will be created in restaurants, hotels and retail shops. It should be mentioned that also the agricultural sector will generate some potential to absorb the additional work force. This absorption will also have an impact on the wage rates in Germany. Due to the little effects of the Scenario Pop on the employment the following table 8 presents results only of the scenario PopLab.

Table 8. Change in wage rates in Germany, Scenario PopLab relative to Baseline, in percent

	2020	2025
Skilled workers		
Non-Agricultural sectors	-0.37	-0.30
Agriculture	-0.51	-0.69
Unskilled workers		
Non-Agricultural sectors	-0.91	-0.89
Agriculture	-1.53	-1.82

Source: Own simulation based on MAGNET.

As described above we apply a labor market split for the agricultural and the non-agricultural sectors. Transition of labor between agricultural and non-agricultural sectors is possible but within each sub-group, i.e. agriculture and non-agriculture, skilled and unskilled labor is modelled as homogenous.

As presented in table 8 the absorption of additional labor force will lower wages for skilled and unskilled workers in both agriculture and non-agriculture. The strongest effect, however, will occur for unskilled workers. Here, the integration of additional workers will depress wages stronger than for the group of higher educated, skilled workers. And the absorption of additional workers in agriculture will lower the unskilled wage rates more than wages for this labor category outside agriculture.

4. Qualification

To capture the impacts of additional migration to Germany a first set of simulations was conducted based on the Thünen-Baseline. A number of limitations have to be considered:

Simulations reflect a quite stable development of the total German population. It has to be seriously evaluate whether the inflow of migrants remain balanced compared to the outbound migration after 2017. Further a more detailed analysis has to be conducted to what degree the population of the migrants is consistent with that of the current population. As the male share is much higher it is an open topic and whether dependent migration of relatives is or will be possible is still unclear and doubtable.

Consumption pattern of migrants will to a certain degree convert to the one of the ethnic German population so impacts driven by consumption will be mitigated until 2020 respectively 2025. In addition simulated changes in GDP will affect domestic demand as well. This feedback loop still needs to be considered.

As the recent inflow of migrants is creating a kind of jump in the population it is an unsolved topic to what degree the additional inflow will follow past pattern in the integration into the work force. Due to high numbers integration might become more difficult and might capture longer periods than anticipated. Although the share dedicated to certain sectors might be more variable and also the share of unemployment might be affected.

Current implementation of labor and labor wages reflect flexible rate for skilled and unskilled labor. In reality, German labor markets are regulated by a minimum wage scheme across nearly all sectors; however, the regime is mostly affecting unskilled labor, which displays largest impacts. So, an implementation of a swap under a different closure setting would allow to identify the consequences of a rising labor force on the unemployment rates of skilled and unskilled labor.

5. Conclusions

Given the assumption on hand the simulation provide some insights into the impacts of inbound migration into Germany. Although some effects in the agricultural sector are to expected those will concentrate on certain products of the animal sector. Some effects are not negligible like for poultry and sheep meat; however, affects will be mitigated over time driven by price adjustments. Expectations to overcome current low prices in agriculture are most likely unrealistic. In addition, this additional consumption will provide only very limited production effects and only marginally affects the GDP growth of Germany.

In one of the simulation we assumed stable education and training pattern which in turn will lead to an increasing degree of integration in the labor force. Hereon based participation in the labor market will induce additional GDP growth. As a considerable share of migrants is currently under age, training and education for recognised refugees is a key in their integration into society. A considerable need for training can be assumed.

As job market integration is an important aspect of general integration into society, entry barriers to employment should not be too high. Flexible work arrangements, such as in temporary jobs (Zeitarbeit) or contracts for specific projects (Werkverträge), should be maintained. Migrants should not be privileged over other employees, but should also not be disadvantaged. Our scenario results show that the integration of additional labor force will have diverting effects on the wage rates for skilled and unskilled workers with a stronger decline in wages for unskilled workers compared with wages for skilled workers.

An integration of migrants into the labor force will create jobs in all sectors of the economy with a positive impact on German GDP. To create this possible impact on German GDP functioning of the

German job markets will be crucial – a higher degree of wage flexibility would help to integrate the inflow of additional population into the German job markets. At the moment there exist strong limits in this respect with minimum wages bounding wage flexibility in a specially unskilled labor. Whether a weakening of the strong minimum wage regulations would help to enhance integration is an unsolved question due to the fact that general acceptance of migrants might be at stake.

6. References

BAMF (2016a)
https://www.bamf.de/SharedDocs/Anlagen/DE/Downloads/Infothek/Statistik/Asyl/statistik-anlage-teil-4-aktuelle-zahlen-zu-asyl.pdf?__blob=publicationFile

BAMF (2016b)
https://www.bamf.de/SharedDocs/Anlagen/DE/Publikationen/Migrationsberichte/migrationsbericht-2014.pdf?__blob=publicationFile

BAMF (2016c) Asylgeschäftsstatistik Februar 2016
http://www.bamf.de/SharedDocs/Anlagen/DE/Downloads/Infothek/Statistik/Asyl/201602-statistik-anlage-asyl-geschaeftsbericht.pdf?__blob=publicationFile

BAMF (2011) Migranten am Arbeitsmarkt in Deutschland
https://www.bamf.de/SharedDocs/Anlagen/DE/Publikationen/WorkingPapers/wp36-migranten-am-arbeitsmarkt-in-deutschland.pdf?__blob=publicationFile

Bundesministerium für Ernährung und Landwirtschaft (BMEL) (2015) Umsetzung der EU-Agrarreform in Deutschland. Ausgabe 2015. Broschüre des Bundesministeriums für Ernährung und Landwirtschaft.

Bundesministerium der Inneren (BMI) (2015)
http://www.bmi.bund.de/SharedDocs/Pressemitteilungen/DE/2016/01/asylantraege-dezember-2015.html

Bundesministerium des Inneren (BMI) (2015) Mehr Asylanträge in Deutschland als jemals zuvor, Press release from 6. Januar 2016.

Chantreuil F., K., F. Hanrahan ,M. van Leeuwen, eds (2011), "The Future of EU Agricultural Markets by AGMEMOD", Springer Netherlands, ISBN 978-94-007-2291-0.

DIW (2016) http://www.diw.de/documents/publikationen/73/diw_01.c.518252.de/15-45-4.pdf

German Federal Statistical Office (2014) Migrationsbericht des Bundesamtes für Migration und Flüchtlinge im Auftrag der Bundesregierung.

German Federal Statistical Office (2014) Bevölkerung und Erwerbstätigkeit –Bevölkerung mit Migrationshintergrund –Ergebnisse des Mikrozensus- https://www.destatis.de/DE/Publikationen/Thematisch/Bevoelkerung/MigrationIntegration/Migrationshintergrund2010220147004.pdf?__blob=publicationFile

IAB (2015) http://doku.iab.de/aktuell/2015/aktueller_bericht_1514.pdf

IAB (2015): Flüchtlinge und andere Migranten am deutschen Arbeitsmarkt. Der Stand September 2015 http://doku.iab.de/aktuell/2015/aktueller_bericht_1514.pdf

Institut für Sozialforschung und Gesellschaftspolitik (2009) Flüchtlinge und andere Migranten am deutschen Arbeitsmarkt: de Stand im September 2015

Ministry of Foreign Affairs (2016) Aktuellen Zahlen zu Asyl –February 2016.

OECD-FAO (2015) OECD-FAO Agricultural Outlook 2015-2024 [online] OECD Publishing, Paris, to be found at http://dx.doi.org/10.1787/agr_outlook-2015-en [quoted 10.12.2015]

Offermann F, Banse M, Deblitz C, Gocht A, Gonzalez-Mellado A, Kreins P, Marquardt S, Osterburg B, Janine Pelikan J, Rösemann C, Salamon P, Sanders J (2016), "Thünen-Baseline 2015 – 2025:

Agrarökonomische Projektionen für Deutschland“, Braunschweig: Johann Heinrich von Thünen-Institut, 116 p, Thünen Rep 40 DOI:10.3220/REP1458557428000

Statistik der Bundesagentur für Arbeit (2014):
http://www.bundesregierung.de/Content/DE/_Anlagen/2014/12/2014-12-03-analyse-des-arbeitsmarktes-fuer-auslaender.pdf?__blob=publicationFile

Statistik der Bundesagentur für Arbeit (2016):
http://statistik.arbeitsagentur.de/Navigation/Statistik/Grundlagen/Grundlagen-Nav.html

UNCHR (2016):
https://s3.amazonaws.com/unhcrsharedmedia/2015/2015-midyear-trends-report/2015-12-18_MYT_web.pdf

USDA (2014a) Historical and Projected Population and Growth Rates in Population for Baseline Countries/Regions 2000 – 2030. [online] to be found at <http://www.ers.usda.gov/data-products/international-macroeconomic-data-set.aspx> [quoted 29.07.2015]

USDA (2014b) Real Projected Gross Domestic Product (GDP) and Growth Rates of GDP for Baseline Countries/Regions 2000-2030 (in billions of 2010 dollars). [online] to be found at <http://www.ers.usda.gov/data-products/international-macroeconomic-data-set.aspx> [quoted 29.07.2015]

Woltjer G. and Kuiper M., (2014), The MAGNET Model, Module Description:
http://www.magnet-model.org/MagnetModuleDescription.pdf