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Market and Education Integration
in Austria**

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Inhalt

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Abstract

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While different data sources contain different aspects relevant for integration research, a "complete" picture of integration processes as well as the identification of supporting and hindering factors for successful integration typically requires a combination of different data sets that may also enrich longitudinal (register-based) individual data by more detailed characteristics from survey data.

Keywords: dynamic microsimulation, migration, labour market integration, immigrant integration, social security, education

JEL-Codes: J11, C53, F22, O15, R23, J15, H55, I24

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1. Introduction

In the past decades, the age structure, the size and the composition of the resident population in Austria has been determined to a large extent by migration flows. These migration movements were driven by labour migration (guest worker migration in the past) as well as by family reunification, free movement within the EU states and recently international flight migration. In 2015, Austria, among other OECD countries, experienced humanitarian migration on an unprecedented scale. Asylum migration to Austria, propelled by the crisis in Syria, Iraq, and Afghanistan, reached almost 90,000 applications during 2015 (Bock-Schappelwein – Huber, 2016).

Austria already was an important (transition) country for refugees, beginning in 1956 with the Hungarian crisis. In the 1960s until the economic crisis in 1973/74, migration flows to Austria were characterised by guest worker migration. One exception was the flight migration from the former Czechoslovakia in 1968 after the invasion by the Warsaw Pact troops. Back then, the focus was on recruiting mostly low-skilled guest workers for temporary employment in Austria to dampen the labour shortage which was slowing down economic growth. The unsuccessful recruitment agreement with Spain in 1962 was followed by an agreement with Turkey (1964) and then with the former Yugoslavia (1966). The immigration of guest workers lasted until the late 1980s, albeit at a noticeably slower pace. After the imposition of martial law refugees from Poland revived the otherwise moderate net immigration of the 1980s. Beginning in 1989, the fall of the Iron Curtain, the armed conflicts in the former Yugoslavia and the increasing demand for foreign labour then led to a sharp rise in the proportion of foreign population in Austria from 4.9% (1989) to 8.4% (1994) (Lebhart – Marik-Lebeck, 2007a, 2007b; Biffl – Bock-Schappelwein, 2013). From the mid-1990s until the pre-crisis year 2008, the share of foreign population increased to 10.1%, in particular due to migration flows from EU countries. With the end of the transitional period for restricting the free movement of workers from 2011 and 2014 for the EU accession countries in 2004 and 2007 respectively, this share grew noticeably faster in the following years than in previous years.

Immigration will continue to be the most dynamic part of population growth in the future according to population forecasts. The surge in immigration has been accompanied by hopes as well as fears. As in many other EU countries, the hope has been that increased migration may help to offset the declining native working-age population and may thus enhance the sustainability of the Austrian pay-as-you-go pension system as well as avoiding reduced growth because of labour market shortages. The concerns are related to increased unemployment and lower wages as well as increased costs to the Austrian welfare system¹ and rising inter-ethnic and intra-ethnic conflicts potentially caused by immigration. Throughout the accompanying political and societal debate, however, the role of integrating immigrants into the Austrian society in shaping these outcomes has been hardly researched. Despite the

¹ See Spahl et al. (2017) for a recent survey of studies on this topic in Austria, Germany and Switzerland.

fact that reaping the potential benefits and avoiding the potential costs of migration, requires that immigrants integrate into host countries' societies and labour markets.

From an economic perspective, immigrants will be net contributors to the Austrian social security system only if they are well integrated into the labour market. Similarly, they will be able to reduce labour market shortages only if they are allowed and able to utilize the skills they bring with them. Furthermore, successful integration of immigrants is also likely to improve social cohesion and thus mitigates potential social and political conflicts. The recent inflow of asylum seekers features many new and unknown aspects: Their educational and skill backgrounds were unknown and the distinct, diverse cultural backgrounds in conjunction with the war and flight experiences of this group may lead to specific challenges of adapting to their new cultural, social and economic environment. These aspects may also affect the asylum seekers' social and economic performance in Austrian society in ways difficult to compare to past immigrant experiences and thus to predict.

The current paper aims to provide a survey of existing data sets and research results about the economic integration of migrants into the Austrian labour market or into the formal education system that could be used to model and predict their integrational pathways. Among the many analysis and measurement dimensions of immigrant integration we focus on previous results concerning the labour market and educational integration of immigrants. Labour market integration is an important determinant of first-generation immigrants' and prime-age migrants income prospects and thus also of their social integration, while integration into the formal education system is central to the progress of young and possibly also second-generation migrants. The paper also aims to identify research gaps and potential data sources for conducting further analyses.

We start our analysis by surveying the different data sets. Section 3 uses examples from the literature to show how the data have been applied in previous research, while section 4 concludes by discussing potential topics for data development and future research.

2. Available data sets

In-depth scientific research on the longer-term development of immigrant integration into their host-country's society requires a coherent and comprehensive (ideally full census) data set on immigrants, migrant workers as well as on the resident population, and their socio-economic development over time. Researchers interested in economic, educational and social integration and migration issues in Austria, so far have relied on various data sources focusing on different aspects of migration and integration. Some of these are self-collected primary (mostly interview) data (see, e.g., Bilger et al., 2017; Bretschneider, 2016; Buber-Ennsner et al., 2016, for recent contributions). We will not cover these in this overview since they are usually only collected at one point in time, differ vastly with respect to quality and definitions and are also usually not publicly available.

We focus on full census and sampling data sets that are repeatedly collected, publicly available and thus available for future research. These data sets are:

Register-based administrative data

1. Main population statistics (POPSTAT) provide results on the number and structure (age, sex, nationality) of the **population with main residence in Austria**. In addition, there are statistics on the individual components, which constantly change the size and structure of the population, i.e. on births, deaths and migration (see below). Data on naturalisations, marriages and divorces complement the population statistics system. In any case, the statistics mentioned are available at the level of the federal states, usually also for smaller administrative units (NUTS-3, political districts, municipalities)².
2. The Register of educational attainment (EAR) contains information on the formal education degrees of the Austrian population based on the latest population census (2001) and is updated by all degrees achieved at Austrian schools and universities and data on apprenticeship examinations. Additionally, data from the Public Employment Service (AMS) are incorporated about the educational attainment of registered unemployed persons. Data from the survey on procedures for the recognition and assessment of foreign educational and professional qualifications (AuBG) are also incorporated in the EAR. For all persons over 15 years of age for whom no educational qualifications are recorded in the EAR the highest level of education is imputed statistically (Statistik Austria, 2017).
3. Schooling Statistics and the University Statistics (SHS) provide information on pupils by sex, age, and citizenship. The Schooling statistics additionally collects information on pupils' colloquial language, special educational needs, and the start of compulsory school attendance on the school level.
4. The Austrian Social Security Database (ASSD) including data from labour market database (AMDB³) provides information on the Austrian labour market, such as employment and unemployment episodes, periods outside the labour market system, etc. The data basis consists of raw data from the Austrian social security institutions (Dachverband der Sozialversicherungsträger – HV) and the Austrian Public Employment Service (Arbeitsmarktservice Österreich – PES). The ASSD is an individual-level administrative panel data set collecting all social security episodes of **all individuals covered by social insurance in Austria (and therefore not restricted to persons residing in Austria)**. Since registration with the Austrian Social Security System is compulsory for all economically active persons and virtually all other residents of Austria, this provides information on employment careers (daily) and earnings⁴ (yearly) on virtually all of the Austrian workforce since the early 1970s. In conjunction with the labour market database maintained by the Austrian Public Employment Service (PES) this data is also informative on the various active and passive

² https://www.statistik.at/web_de/statistiken/menschen_und_gesellschaft/bevoelkerung/index.html.

³ <https://www.arbeitsmarktdatenbank.at/>.

⁴ I.e. Social security contribution bases.

labour market policies received by individuals (see Hofer – Winter-Ebmer, 2003; Zweimüller et al., 2009, for details).

5. The Register-based labour market and employment statistics (Abgestimmte Erwerbsstatistik – AES) aims at integrating available administrative data (especially the aforementioned social security and unemployment register data, the Register of educational attainment (EAR) as well as data from Schooling and University Statistics) into a comprehensive dataset of labour market statistics and is produced annually for the reference date of October 31 each year since 2008. It covers **all persons** who were registered **as having their main residence in Austria** or who were homeless as of October 31 of each year. Besides assigning a labour market status to each person the AES also informs about diverse demographic characteristics for the Austrian resident population and provides yearly numbers on employment, unemployment and economically inactivity on a municipality or higher level (see Statistik Austria, 2018a, for details).
6. Register-based Labour Market Career (REV) aims at providing a complete picture of employment biographies by adding longitudinal information to cross-sectional information contained in the AES. The data allow analyses of the stability of employment biographies and typical employment patterns of different groups of people. The data of the REV are obtained from administrative data of Statistik Austria which are processed to create overlap-free employment careers from 2009 onwards. In contrast to the AES, the data also include persons who are not part of the Austrian resident population (commuters).
7. Data from the Austrian migration statistics (Wanderungsstatistik – MIGSTAT) – which is based on the legal **registration of all residents** in Austria and collects annual place to place residential moves within the country as well as from/to abroad at the community level, by age, gender, nationality and country of birth (see Statistik Austria, 2018, for details).
8. Data from the Austrian asylum seeker (AIS) and the third country resident information system (FIS) were merged to the "Integrierte Fremdenapplikation" (IFA) and "Integrierte Zentrale Fremdenregister" (IZR) at the beginning of 2014. The IZR contains data on **third-country (i.e., non-EU) nationals** whose residence is governed by the Settlement and Residence Act (Niederlassungs- und Aufenthaltsgesetz - NAG). It includes all residence entitlements, applications in the current year and permits in the current year (by type of residence permit, gender, nationality, age). It also includes the number of documents applied for and the issued documents (based on the right of residence under Union law). The Asylum statistics contains data on **asylum seekers** (by age, gender, nationality), asylum applications and decisions (see Statistik Austria, 2018, for details).
9. The "Education-related employment career-monitoring" (BibEr) data monitors the transition from education to the labour market and provides information on graduates of a formal educational institution, persons leaving a formal educational institution without obtaining a degree, early school leaver (FABA) and NEETs (Not in Employment, Education or Training). The database is generated from structured administrative data from the

Austrian Federal Statistical Office on education and the labour market and is designed as a full census.

10. The Austrian standards-based proficiency test ("Bildungsstandards") in German, Mathematics and English for the 4th and 8th grade⁵, implemented in 2012 in the Austrian education system⁶ and conducted by BIFIE (Bundesinstitut für Bildungsforschung, Innovation & Entwicklung des österreichischen Schulwesens/Federal Institute of Educational Research, Innovation and Development of the Austrian Educational Sector) reviews the expected learning outcomes, focusing on the core areas of a subject to be achieved by the pupils at the end of primary school at the 4th grade in German (reading and writing) and Mathematics and at the 8th grade in German, Mathematics and English in the academic-track secondary schools (Gymnasium/Allgemeinbildende Höhere Schule AHS) and general secondary schools (Mittelschule) (Eurydice, 2009). The data are distinguished, among other things, by gender, migrant background and first language. The definition of the migration background is based on that of the OECD, which uses the country of birth of the parents as a criterion and not the current language habits. One child is a pupil with a migrant background if both parents were born abroad. A child is defined as a pupil without a migrant background if at least one parent was born in Austria. The only exception to this rule is pupils whose parents (one parent or both) were born in Germany – they are not included in the group of pupils with a migrant background due to the same language (BIFIE definition).

Survey data

11. The Austrian Labour Force Survey (LFS), which is part of the European Labour Force Survey and is collected together with the Austrian Mikrozensus⁷. It collects information on the labour market and housing situation of individuals with permanent residence in Austria living in private households (i.e., excluding group quarters).
12. The European Union Statistics on Income and Living Conditions (EU-SILC) – which is a rotating panel that relies on a much smaller sample size than the LFS and collects information on living conditions and income of Austrian residents living in private households⁸.
13. The Survey of Health, Ageing and Retirement in Europe (SHARE)⁹ is a multidisciplinary and cross-national panel database of micro data on health, socio-economic status and

⁵ Examinations have been made at the 4th grade in Mathematics in 2013 and in 2015 in German (reading and writing), and at the 8th grade, the educational standards were tested in 2012 in Mathematics and 2013 in English; in 2016, educational standards were recorded in German and 2017 in Mathematics.

⁶ The results are to be understood as system feedback and less as individual feedback to the pupils.

⁷ See http://statistik.at/web_de/frageboegen/private_haushalte/mikrozensus/index.html for details.

⁸ See http://www.statistik.at/web_de/frageboegen/private_haushalte/eu_silc/index.html for details.

⁹ <http://www.share-project.org/home0.html>.

social and family networks of individuals aged 50 or older and contains information about migrants.

14. The Programme for International Student Assessment (PISA) conducted by OECD is an assessment of mathematics, science, and reading skills of 15-year-old students while the Trends in International Mathematics and Science Study (TIMSS) measures both 4th and 8th grade students on concepts of mathematics and science. The Progress in International Reading Literacy Study (PIRLS) assesses 4th grade students on concepts of reading and literacy (TIMSS and PIRLS are conducted by IEA – International Association for the Evaluation of Educational Achievement). PISA distinguishes students by their country of birth, their migration background and also differentiates among students according to the language they speak at home most of the time. In PIRLS, data are distinguished by migration background, country of birth and multilingualism, in TIMSS by migration background. In both, migration background is distinguished by first generation (foreign-born students whose parents were also foreign-born) and second generation (students who were born in the country of assessment, but whose parents are foreign-born) (Suchan et al., 2012).
15. The Programme for the International Assessment of Adult Competencies (PIAAC) is an internationally agreed assessment of adults in literacy, numeracy and problem solving in technology-rich environments and contains a list of information about migrants (country of birth, year of or age at arrival in the host country, first language, language spoken most often at home, mother born in the host country, father born in the host country, country where highest educational qualification was obtained) (Paccagnella, 2016).

2.1 Types of data available

The data sources mentioned above can be grouped along three dimensions: coverage, scope, and design.

2.1.1 By coverage

Data can be differentiated according to whether they are tailored to a specific target group (e.g. asylum statistics) or whether they cover the entire population or workforce respectively. We distinguish three types of coverage ((almost) entire population, subgroup of the population, subgroup of migrants):

1. General purpose datasets, which are collected to provide information on the population in general but can also be used to obtain insight on immigrants. Among the data sets mentioned in Section 2 for example the Austrian Social Security Dataset, the LFS, EU-SILC as well as data from the population statistics, the register-based labour market and employment statistics, the education attainment register and the migration statistics belong to this category.

In these data sets one of the central issues is the definition of the population of interest as this will also determine which types of immigrants are captured in the data. For instance the population of interest in the ASSD are persons insured with the Austrian Social Security

System (including commuters from abroad), while in the LFS and the EU-SILC as well as the population register, the register-based labour market statistics, the education attainment register and migration statistics the residents of Austria are the population of interest.¹⁰

Consequently, the ASSD includes incomplete labour migration¹¹ (commuters, and temporary as well as seasonal workers), as this is associated with an obligation to register with the Austrian Social Security System. It, however, does not include immigrants that are not required to register with the Austrian Social Security System (such as retirement immigrants from other EU countries). The LFS, by contrast, only includes moves that are associated with a shift in permanent residence. It therefore only captures a part of the temporary and circular migrants and excludes commuters altogether. On the other hand, it will include forms of migration such as retirement migration as long as this is associated with a shift of permanent residence. Finally, data from the population register and of the migration statistics only consider registered residents that have a main residence in Austria. Consequently, daily as well as weekly or monthly commuters, circular and short-term migrants are also not included in this data.¹²

2. Data sets focusing on particular subgroups of the migrant population such as the Austrian asylum seeker information system, or the third-country residents information system which pertain to specific legal procedures that apply to certain types of immigrants. Such data have the advantage of providing detailed information on specific Immigrant groups. For instance, the third-country residents information system contains complete information on the various residence titles obtained by third-country immigrants, while the Austrian asylum seeker information system contains information on the legal status of Asylum seekers in Austria. Unfortunately, these data provide very few demographic characteristics and are also not available on an individual level. Researchers using these data therefore often must rely on the tabulations available from the respective publications of the authorities collecting the data (e.g. the Federal Ministry of the Interior – BMI, 2018). Furthermore, these data are also rather sensitive to administrative and legal changes such as

¹⁰ This applies to all the data sets although the LFS does not collect data on persons residing in group quarters.

¹¹ Incomplete migration are forms of mobility in which the migrant does not completely dissolve the residence in the sending region. Examples include (daily, weekly or monthly) commuting and seasonal work arrangements in which the migrant resides with the employer but maintains residence status in the home country.

¹² By law all foreign citizen with temporary residence are required to register their residence immediately after arrival and irrespective of whether they maintain a parallel residence abroad. However, the population register, the register-based labour market statistics and migration statistics only report changes in main residence. This is defined as the "place of central interest of life" and is determined by criteria such as the duration of stay, the location of the place of work and the location of residence (see <https://www.help.gv.at/Portal.Node/hlpd/public/content/99/Seite.990076.html>). Short term migrants are therefore not included in this data if their place of "central interest of life" remains to be located abroad.

e.g. the changes in regulations concerning migration caused by EU accession of Austria in 1995 or accession of the EU12 countries after 2004.¹³

3. Data sets on certain subgroups of the population at large that also allow for the analysis of the immigrants among this group. One such dataset is the Survey of Health, Ageing and Retirement in Europe (SHARE) which focuses on the population of Austria aged 50 years or older. These data allow for a detailed analysis of a specific group of immigrants relative to their native counterparts but cannot provide an overview of the integration of the overall immigrant population. While PIAAC focuses on adults (16 to 65 years of age) PISA, PIRLS and TIMMS are targeted at students (at age 6, 10 – PIRLS and TIMMS – and 15 – PISA) respectively.

¹³ For instance, Bock-Schappelwein (2005) shows that the EU accession of 10 countries in 2004 led to a reduction of the number of residence titles covered in FIS-data by 69,600, on account of the citizen of the new member states not requiring such titles any more.

Table 1: Features of main datasets providing information on the integration of migrants in Austria

	Coverage	Scope	Type	Dissemination level
Register based statistics				
POPSTAT / MIGSTAT	Permanent residents	Admin. Register	Panel	Publicly available aggregates ¹
AES / REV	Permanent residents	Admin. Register	Panel	Publicly available aggregates ¹
EAR / SHS	Permanent residents	Admin. Register	Panel	Publicly available aggregates ¹
ASSD	Persons Insured with the social security system / registered unemployed	Admin. Register	Panel	Publicly available aggregates ¹
IFA	Third country nationals and asylum seekers	Admin. Register	Panel	Publicly available aggregates ¹
BibEr	Permanent residents	Admin. Register	Panel	Publicly available aggregates ¹
Bildungsstandards	Permanent residents	Admin. Register	repeated cross-section	only report
Survey data				
LFS	Permanent residents	Sample survey (quarterly 30,000 households)	Rotating panel (5 quarters)	Publicly available scientific use files
EU-SILC	Permanent residents	Sample survey (annual 6,000 households)	Rotating panel (4 years)	Publicly available scientific use files
SHARE	Permanent residents	Sample survey (annual around 5,000 observations)	Panel	Publicly available scientific use files
PISA, PIRLS, TIMMS	Permanent residents	Sample survey (around 7,000 (PISA), 4,000 (PIRLS), 7,000 (TIMSS) observations)	Repeated cross-section	Public use version
PIAAC	Permanent residents	Sample survey (around 5,000 observations)	Cross-Section	Publicly available scientific use files

Source: WIFO. – ¹ Individual level data available with special procedures.

2.1.2 By scope

Another distinguishing feature is whether the data are based on a full survey or sampling data. Here one can differentiate between

1. Register and administrative data which covers the entirety of a particular population of interest. This includes the population statistics, migration statistics, education attainment register, schooling statistics, the ASSD as well as the third-country residents information system and Austrian asylum seeker information system. The advantage of such data is that they are based on complete survey of the entire population of interest. This thus also allows for the analysis of small subpopulations. The disadvantage is that they usually collect only a limited amount of information only and are also subject to limited use through

privacy laws. Thus, for instance the ASSD although available to researchers lacks data on the educational attainment of immigrants as well as on their household structure. By contrast, the Austrian migration statistics provide detailed information on residential mobility within Austria and abroad but lack information on educational attainment and many other background characteristics, while the population statistics provides detailed information on the places of residence and labour market status of immigrants as well as many background characteristics of the immigrants.

2. Sample survey data which results from interviewing a representative subsample of the population such as the LFS, EU-SILC, PISA, PIRLS, TIMSS or SHARE. These data often contain a large number of questions and but suffer from the drawbacks of the limited number of observations and the possible systematic under-coverage of certain sub-populations (e.g. short-term residents). For instance, EU-SILC data provides information on about 6,000 private households in Austria, the LFS samples around 30,000 households each quarter and in SHARE data around 5,000 individual observations are available.
3. "Combined register data": The Register Based Labour Market Statistics combines data from various registers and administrative data sources to overcome some of the limitations stemming from the fragmentation of information over different data sources. In principle, this form of combined register data has a lot of merits with respect to the analysis of immigrants' integration into the education system and labour market. But, unlike e.g. the ASSD data, the AES only evaluates residents' labour market status at one specific date (October 31) each year. Hence, it gives a detailed "snapshot" of the population under consideration without providing information on intra-year events such as labour market transitions taking place at higher than yearly rates. In contrast the Register based labour market careers (REV) provide a longitudinal perspective on individuals' employment careers based on a rich set of administrative data resampling the AES but enriched by longitudinal labour market career information based on social security as well as unemployment register data (Wanek-Zajic, 2016). Also, in the data of REV, information on the birthplace of parents is available for almost all persons up to the age of about 30 years and thus allows for analysing employment careers of (young) second generation immigrants (Wanek-Zajic – Lechner, 2019).

2.1.3 By design

Finally, a last division line along which data can be described is whether it allows for repeated observations of the same individual over a sustained period of time (i.e., panel data), a repeated cross-section, which may allow for the construction of aggregate time series, or a cross-section, which allows for a one-time observation only.

Among the data sets covered in this survey the ASSD and the SHARE data are panel datasets, which are also disseminated as individual level panels. By contrast, the EU-SILC and the LFS are rotating panels. In the LFS a respondent is surveyed for five quarters, before being replaced. In the EU-SILC a respondent stays in the sample for four years. Consequently, these

surveys provide for a rudimentary panel structure, which allows observing respondents for a period of one (LFS) or four (EU-SILC) years. However, previous national and international research has mostly used these surveys as a cross-sectional or repeated cross-sectional dataset (see, e.g., Huber – Oberdabernig 2016, 2016a; Huber, 2014; Huber – Bock-Schappelwein, 2014).

The population statistics, the register-based labour market statistics and migration statistics as well as IFA data, by contrast, are panel data sets as they include a unique identifier for each individual. Their full capacity is, however, usually not used in research, as privacy laws do not allow analysing this data at an individual level (IFA) or allow this only under certain provisions (population register, the register-based labour market statistics and migration statistics).

2.2 General data Issues

General issues related to the definition of migrants, the variables available to measure integration outcomes and the individual background characteristics that can be used to assess the determinants of integration arise independent of the data set used.

2.2.1 Definition of immigrants and immigrant groups

When defining migrants one of the most crucial division line is between a nationality-based and a place of birth-based approach. According to the latter, migrants are all foreign-born persons (i.e., all persons that have moved their place of residence across borders at least once in their life), while according to the nationality-based definition only persons with a foreign nationality are considered as immigrants. The citizenship definition therefore excludes foreign-born persons that received Austrian citizenship (i.e., were naturalized) since their arrival in Austria. The foreign-born definition, by contrast, includes Austrian citizens born abroad. Depending on the generosity and details of the nationality law of a country, the differences between these concepts can be sizeable. Thus, countries with more lenient naturalization laws, or a migrant population that has resided in the country for a longer time on average, all else equal, have larger differences between the two concepts. Countries (e.g. Germany) that provide citizenship based on descent rather than the place of birth are likely to differ substantially in this respect from countries basing citizenship on the place of birth. In Austria the share of foreign-born exceeds the share of foreign citizens in the population by around 3 percentage points¹⁴ (see Bock-Schappelwein, 2005 for a more detailed comparison of these concepts for Austria).

In general, the place of birth definition has become the preferred definition in international (and specifically in comparative) research. In comparative analyses this is because this definition is not influenced by differences in naturalization laws across countries. In single-country

¹⁴ Share of foreign nationality: 16.2%, share of foreign-born: 19.5% (01/01/2019; Source: Statistik Austria – population statistics).

studies this is because the disadvantages of immigrants with respect to the labour market and educational integration persist even after obtaining citizenship.¹⁵ As a consequence, focusing on a citizenship definition of migration may mask crucial aspects of immigrant integration.¹⁶

Nonetheless, some (mainly administrative) data sets such as IFA and the data from the population statistics and the register-based labour market statistics provide only a nationality-based definition of migrants. The migration statistics, LFS, SHARE, and EU-SILC data provide both concepts and in the ASSD the birth place-based definition of immigrants is imputed from historical data on the nationality of a person when entering the dataset.¹⁷

¹⁵ Further focusing on the citizenship may also lead to misleading estimates of changes in the immigrant share in an economy in times of high immigration. For example, Bock-Schappelwein (2005) reports that focusing on foreign citizenship underestimated the increase in foreign born residing in Austria in the early 2000s by around 44,000 persons (or around 0.5% of the population) on account of naturalization.

¹⁶ The preference for one of these definitions of migrants is, however, not independent of the objective of the study. For instance, recent research on the impact of naturalization on labour market integration of immigrants is heavily dependent on the availability of historicized citizenship data (see, e.g., Gathman – Keller 2014)

¹⁷ The Austrian PES imputes a person to have a first-generation migration background if a person registered with the Austrian social security system either has a foreign citizenship or can be shown to have been naturalized in the past. Since reporting naturalizations with the social security system is mandatory, this imputation does not accord with official foreign-born shares in other sources (see Kraml, 2014).

Table 2: Definition of immigrants and immigrant groups in different datasets

	Definition of immigrants	Definition of temporary immigrants	Definition of circular (incomplete) migrants	Definition of motive for migration	Definition of second-generation migrants
Register based statistics					
POPSTAT / MIGSTAT	Nationality	n.a.	n.a.	n.a.	n.a.
AES	Nationality / Place of Birth	n.a.	n.a.	n.a.	n.a.
REV	Nationality / Place of Birth	n.a.	n.a.	n.a.	Place of birth of father and mother e)
EAR / SHS / BibEr	Nationality	n.a.	n.a.	n.a.	n.a.
ASSD	Nationality / Place of birth ^a	Derived ^b	Derived ^b	Imputed ^c	Imputed ^d (as of 2007)
IFA	Nationality	According to legal definition	According to legal definition	According to legal definition	According to legal definition
Austrian standards-based proficiency test	Place of Birth	n.a.	n.a.	n.a.	Place of birth of father and mother
Survey data					
LFS	Nationality / Place of Birth	n.a.	n.a.	n.a. (except for ad-hoc modules)	Place of birth of father and mother
EU-SILC	Nationality / Place of Birth	n.a.	n.a.	n.a.	Place of birth of father and mother
SHARE	Nationality / Place of Birth	n.a.	n.a.	n.a.	n.a.
PISA, PIRLS, TIMSS	Place of Birth	n.a.	n.a.	n.a.	Place of birth of father and mother.
PIAAC	Place of Birth	n.a.	n.a.	n.a.	Place of Birth

Source: Own deliberations. – ^a based on historical nationality data, ^b from temporary non-registration in the ASSD, ^c based on the first spell of foreigners ^d based on co-insurance spells with foreign parents as a child, ^e available with an extended data access subject to an additional fee.

Data sets also differ in their possibilities to differentiate between migrant groups. This applies to the differentiation between labour, family reunion, pension, humanitarian and educational migration as well as permanent, temporary or circular migration as well as the possibility to focus on the second generation of immigrants. Thus, in some (mostly administrative) data sets, for example the FIS, the derivation of the migration motive can be imputed from the rights associated with the residence titles of foreign-born (e.g., whether the residence title is associated with a right to access the labour market) and thus based on a legal definition. In other (mostly survey) data sets (e.g., the ad-hoc module of the European Labour Force Survey), by contrast, this definition is based on the self-reported reason for migration and yet in other data sets (such as the ASSD) this definition can only be inferred from auxiliary information, while in data sets such as the population statistics, the register-based labour market statistics and migration statistics such differentiations are not possible at all (see below for details).

Very few data sets provide information on repeated entry or collect information on the immigrants' actual or intended duration of stay. For this reason, most research has been forced to impute such information or has been based on self-collected data (see, e.g., Huber – Nowotny, 2016).

Similar definitional differences apply to second-generation immigrants. Information on these is only available in very few data sets. In the LFS as well as in the EU-SILC second-generation immigrants can be defined through two direct questions on the country of birth of the father and the mother of the respondent. In the ASSD, by contrast, second-generation immigrants can in be imputed from information on whether a person was insured with a foreign citizen as a child, but this information is very incomplete¹⁸. In PISA, PIRLS and TIMSS and Austrian standards-based proficiency test, the definition of second-generation immigrants is based on the internationally used OECD definition (Herzog-Punzenberger – Unterwurzacher, 2009). PIAAC¹⁹ asks about the country of birth, the year or age of arrival in the host country and whether mother and father were born in the host country. In REV, information of parents' place of birth is collected for almost all persons aged 30 or less (but rather incomplete for older persons; Wanek-Zajic – Lechner, 2019).

2.2.2 Outcome Variables

To provide information on the integration of immigrants, the data analysed must measure at least one (and preferably many) integration outcomes. The so-called "Zaragoza Indicators" (see, e.g., OECD – EU, 2015) provide a list of indicators that (according to a recommendation from the EU ministers responsible for the integration) should be used to assess the various dimensions of integration of migrants in international comparisons (see top panel of Table 3).²⁰ According to this list the labour market integration of immigrants should be measured by the difference between migrants' and natives' employment, unemployment, participation and overqualification rates and the differences in self-employment shares. Their integration into the educational system should be measured by their highest completed education, the share of tertiary educated, the share of early school leavers and low school performers, each relative to natives. A recent evaluation report by European-Commission - DG Home Affairs (2013) suggests an additional six labour market indicators and further five education indicators that should be considered (see bottom panel of Table 3).

As shown in Table 4 only few of the data sets surveyed in the current study provide information on these indicators of labour market integration and even fewer on the indicators of

¹⁸ The Austrian PES imputes a person to be a second-generation immigrant if they are co-insured with a foreign citizen as a child. Since such co-insurances are reported only as of 2007 this data severely underestimates the true number of second-generation immigrants in Austria (see Kraml, 2014, for details).

¹⁹ <http://www.oecd.org/education/school/1-Paccagnella.pdf>.

²⁰ The Zaragoza indicators were decided on by the ministers responsible for the integration of migrants in their meeting in Zaragoza in 2010.

integration into the education system. The IFA do not provide any information on the Zaragoza indicators, as their focus is on legal procedures or population moves rather than on integration outcomes. By contrast, the LFS and the population statistics as well as the AES can be (and have been) used to calculate all the main Zaragoza indicators with respect to labour market integration²¹, although even in this data some indicators such as those on overqualification must be imputed from information on the highest completed education and the occupation (see Bock-Schappelwein et al., 2009, for details).²² The ASSD, by contrast, primarily provide information on employment, unemployment and participation rates and on the share of self-employed, while none of the register based data sources can provide any indication of the level of overeducation.

Table 3: Zaragoza-Indicators and suggested additional Indicators

Employment	Education	Social inclusion	Citizenship	Welcoming society
21 Zaragoza-Indicators				
Employment rate	Highest completed education	Risk of poverty	Naturalization rate	Subjective discrimination
Unemployment rate	Share tertiary educated	Income	Share with long term residence	Trust in Public Institutions
Participation rate	Share of early school leavers	Subjective health	Share of Representatives in representative bodies	Sense of attachment
Share of self employed	low- (school-) performers	Share of homeowners	Voter turnout	
Overqualification	Language skills			
25 additional Indicators				
Share of employees in public sector	Participation in early childhood education	Child poverty	Membership in voluntary organizations	Public perception of ethnic conflict
Temporary employment	Participation in lifelong learning	Untreated health problems	Membership in trade unions	Public attitudes to minorities
Part time employment	NEET	Life Expectancy	Membership in parties	
Long term unemployed	Resilient Students	Years in good health	Political Activity	
Accepted foreign Diplomas	Segregation of immigrants in below average schools	Housing cost overburden (SILC)**		
Stay of international students		Overcrowded Housing Working poor Persistent risk of poverty		

Source: DG Home Affairs (2013). – NEET: Not in Education, Employment or Training.

²¹ The LFS and EU-SILC can also be used to calculate the share of public employees, temporary employment, long term unemployment (LFS only) as well as the participation in life-long learning and NEET rates.

²² In studies on Austria this imputation is often based on a comparison of the ISCO classification of occupations and the ISCED classification and the 1-digit correspondence tables provided by OECD (2008).

Among the data sets that do provide information on the outcome indicators, definitions often differ. In particular, all indicators on labour market integration in the LFS and EU-SILC as well as data from the register-based labour market and employment statistics are based on EU-ILO definitions of unemployment and employment, while data from the ASSD are based on national definitions.

Table 4: Availability and definition of integration outcome indicators in different data sets

Labour market	Employment rate	Unemployment rate	Participation rate	Share of self-employed	Overqual.
Register based stat.					
AES / REV	EU-ILO	EU-ILO	EU-ILO	EU-ILO	n.a.
POPSTAT / MIGSTAT	n.a.	n.a.	n.a.	n.a.	n.a.
EAR / SHS	n.a.	n.a.	n.a.	n.a.	n.a.
ASSD	National	National	National	National	n.a.
IFA	n.a.	n.a.	n.a.	n.a.	n.a.
BibEr	National	National	National	n.a.	n.a.
Bildungsstandards	n.a.	n.a.	n.a.	n.a.	n.a.
Survey data					
LFS	EU-ILO	EU-ILO	EU-ILO	EU-ILO	Imputed
EU-SILC	EU-ILO	EU-ILO	EU-ILO	EU-ILO	Imputed
SHARE	EU-ILO	EU-ILO	EU-ILO	EU-ILO	Imputed
PISA, PIRLS, TIMMS	n.a.	n.a.	n.a.	n.a.	n.a.
PIAAC	EU-ILO	EU-ILO	EU-ILO	EU-ILO	Different methods
Education	Highest completed education	Share tertiary educated	Share early school leavers	Low school performers	Language skills
Register based stat.					
AES / REV	EU-ILO	EU-ILO	national	n.a.	n.a.
POPSTAT / MIGSTAT	n.a.	n.a.	n.a.	n.a.	n.a.
EAR / SHS	n.a.	n.a.	n.a.	n.a.	n.a.
ASSD	n.a.	n.a.	n.a.	n.a.	n.a.
IFA	n.a.	n.a.	n.a.	n.a.	n.a.
BibEr	National	national	National	n.a.	n.a.
Bildungsstandards	n.a.	n.a.	n.a.	n.a.	n.a.
Survey data					
LFS	EU-ILO	EU-ILO	EU-ILO	n.a.	n.a.
EU-SILC	EU-ILO	EU-ILO	EU-ILO	n.a.	n.a.
SHARE	EU-ILO	EU-ILO	EU-ILO	n.a.	n.a.
PISA, PIRLS, TIMMS	n.a.	n.a.	n.a.	Yes	n.a..
PIAAC	EU-ILO	EU-ILO	n.a.	n.a.	Yes

Source: Own deliberations.

According to the EU-ILO definition all persons, who spent at least one hour in paid employment in the week preceding the interview are considered employed. The ASSD by contrast captures self-employed and employees that are required to pay social security contributions as well as pensioners. In addition, since 2007 it also provides data on children and economically inactive that are insured with their relatives. Standard employment data (as well as information on wages), however, only refers to persons earning more than the marginal employment threshold, (see Hofer – Winter-Ebmer, 2003, for details).²³

Similarly, according to the EU-ILO definition persons are unemployed if they are not employed, have been actively searching for employment in the week preceding the interview and are available for a job within 14 days, while according to the national definition persons registered as unemployed with PES are unemployed. Employment levels according to the national definition are therefore lower than according to the EU-ILO definition and unemployment levels are higher. This also leads to lower employment rates, higher unemployment rates and lower participation rates according to the national than the EU-ILO definition.

With respect to educational integration LFS data are entirely based on EU-wide definitions, while in BibEr the share of early school leavers is defined according to national definitions. While the share of early school leavers is measured as the percentage of the population aged 18 - 24 with at most lower secondary education who were not in further education or training during the last four weeks preceding the Labour Force Survey according to the EU-wide definition, it is measured as the share of the population aged 18 - 24 not in full-time training following the national definition. As a consequence, this share is larger according to the national than the EU-wide definition.

2.2.3 Background variables

Finally, data sets also differ in the extent to which they consider important background characteristics of the population, which could be explanatory factors for any differences in the level of integration among immigrants. While all data sets collect information on age and gender, some administrative data sets (e.g., IFA, but also the ASSD) contain no information on the highest educational attainment of immigrants (as well as – where applicable – of natives). Furthermore, with respect to integration research one would also like data sets to allow for a differentiation of immigrants by (at least):

- Age at migration or years of residence
- Language proficiency
- Reason for migration
- Country of origin

²³ This implies that employees with a monthly wage below the social security minimum (so called marginally employed) as well as self-employed are not usually reported in this data. In addition, wages are also only registered up to the maximum social security contribution.

as these variables have been shown to be relevant for integration in virtually all international empirical research and may be referred to as the "big 4" variables in integration research on first-generation migrants (see, e.g., Huber et al., 2017, for a survey of this literature).

The availability of these "big 4" variables in different data sources varies. In some cases, they are not available at all, while in others they can be imputed and in yet others they are readily available (see Table 5).

A detailed list of individual countries of origin (defined either as the country of birth or the country of nationality) is available in all data sets, except for the EU-SILC (which provides only for a differentiation of EU and Non-EU immigrants). Using the other survey data sets (i.e., the LFS and the SHARE) differences in integration of immigrants from individual origin countries are, however, rarely analysed, because sample sizes very quickly become too small for meaningful analyses. Immigrants from origin countries that have only few residents in Austria can therefore only be analysed in the administrative datasets covering the entire Austrian population.

Table 5: Information of the "big 4" integration variables in standard research data bases in Austria

	Years of residence	Language proficiency	Reason for migration	Country of origin
Register based statistics				
POPSTAT / MIGSTAT	n.a.	n.a.	n.a.	Nationality
AES / REV	n.a.	n.a.	n.a.	Birth and Nationality
EAR / SHS	n.a.	n.a.	n.a.	Nationality
ASSD	Imputed ^a	n.a.	Imputed ^b	Nationality/Birth ^c
IFA	Imputed ^a	n.a.	Legal definition	Nationality
BibEr	n.a.	n.a.	n.a.	Nationality
Bildungsstandards	n.a.	n.a.	n.a.	Birth and Nationality
Survey data				
LFS	self-reported	n.a. (except for ad-hoc modules)	n.a. (except for ad-hoc modules)	Birth and Nationality
EU-SILC	self-reported	n.a.	n.a.	Only EU and non-EU immigrants
SHARE	self-reported	n.a.	n.a.	Birth and Nationality
PISA, PIRLS, TIMMS	n.a.	n.a.	n.a.	Birth and Nationality.
PIAAC	n.a.	Yes	n.a.	Birth and Nationality

Source: Own deliberation. – ^a from first appearance in the data, ^b from first spell in the data, ^c from historical data on naturalisation.

In the ASSD but also IFA years of residence can be imputed from the first appearance of the person in the data, while in the LFS and EU-SILC this information is directly asked from the respondents. The reason for immigration, by contrast, is not usually available in the Labour Force Survey (except for the ad-hoc modules directed at the immigrant population), but

legal definitions are included in the ASSD as well as the FIS.²⁴ No data set except for the ad-hoc Labour Force Survey modules on immigrants, however, contains information on language proficiency.

In sum, therefore, the data situation for an assessment of the labour market and educational integration of immigrants in Austria is fragmented and strained. Among the data sets covered in this survey only the ASSD and the REV are individual-level panel data set which allows for an assessment of the immigrant workforce and is readily available to researchers. Furthermore, only the LFS (and to a lesser extent the REV) provide a large list of both outcome variables and a fair amount of individual-level controls to assess the integration of immigrants and to control for individual-level determinants of such outcomes. For other data sets the list of outcomes and controls is much more limited. Also, except of the LFS' ad-hoc modules (2008 and 2014 "The labour market situation of migrants and their immediate descendants")²⁵, none of the data sets considered here provides an indication of the language proficiency of immigrants, which has been considered one of the most important determinants of success at integration among migrants in most of the international literature. In addition, data sets also vary widely in the immigrant population considered and the measurement concepts implemented.

3. The use of data in previous research

Research on the integration of immigrants into the Austrian labour market and the Austrian education system is still rather limited and fragmented due to the data availability issues discussed in the previous section. Previous research has often been restricted to the analysis of cross-sectional or repeated cross-sectional data and to presenting stylized facts relating to various dimensions along which first- and second-generation immigrants are disadvantaged relative to natives in the labour market and education system.²⁶

3.1 Research based on the population and migration statistics

Data from the population census has been primarily used in demographic studies to document the regional settlement structure of immigrants in Austria and the sources of population growth. Some of the earlier contributions to this literature (e.g., Huber, 2001, 2002) document several stylized facts also found in much of the international literature. According to this

²⁴ For instance, as of 2007 it is possible to infer whether the first insurance spell of an immigrant was as an asylum seeker, employed as a dependent person employed with another employee. This allows for a differentiation between asylum, labour and other migration. By contrast, the FIS contains a full history of residence titles that can be used to infer on the reason of migration.

²⁵ Respondent are asked to self-assess the degree of command of speaking the main host country language.

²⁶ In this respect the Austrian Statistical Office uses all these data sources to publish a comprehensive annual report entitled "Migration & Integration". This provides a recent descriptive overview of migratory movements and the situation of immigrants in Austria.

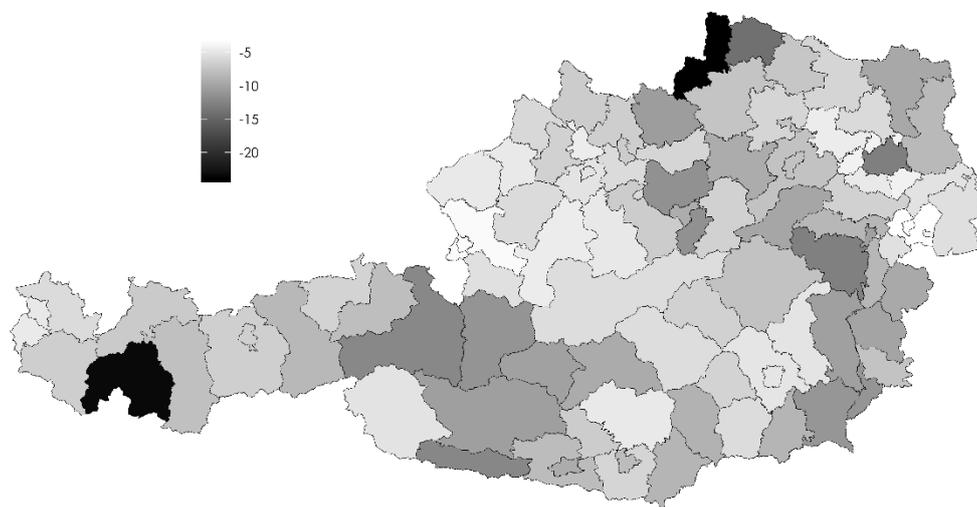
research, immigrants in Austria are in general overrepresented among the urban and in particular Viennese population and are also concentrated in urban areas to a higher degree than in most other OECD immigrant-receiving countries (see OECD – EU, 2015; Huber et al., 2017). Besides, immigrants from neighbouring countries more often settle near the border regions (in particular the borders to their home countries) and therefore also tend to be less spatially concentrated than immigrants from more distant locations.²⁷ This also applies more pronounced to high skilled immigrants and immigrants from groups that have settled in Austria for a longer time, as these are less dependent on ethnic networks than newly arriving and less-educated immigrants (see Huber, 2002).

More recently, Moser (2017) in an innovative contribution has used the individual-level register-based census data linked to individual-level tax data to assess the mobility of unemployed. He presents descriptive evidence that unemployed immigrants are more likely than their native counterparts to migrate across communities. This may imply that (as also found in a substantial body of research in other countries – see, e.g., Borjas, 2001; Anauedo-Dorantes – de la Rica, 2005; Schündeln, 2007; Roed – Schone, 2007) the mobility of immigrants may be an important factor contributing to the equilibration of regional labour market disparities in Austria and that immigrants may, therefore, "grease the wheels" (Borjas, 2001) of the Austrian economy.

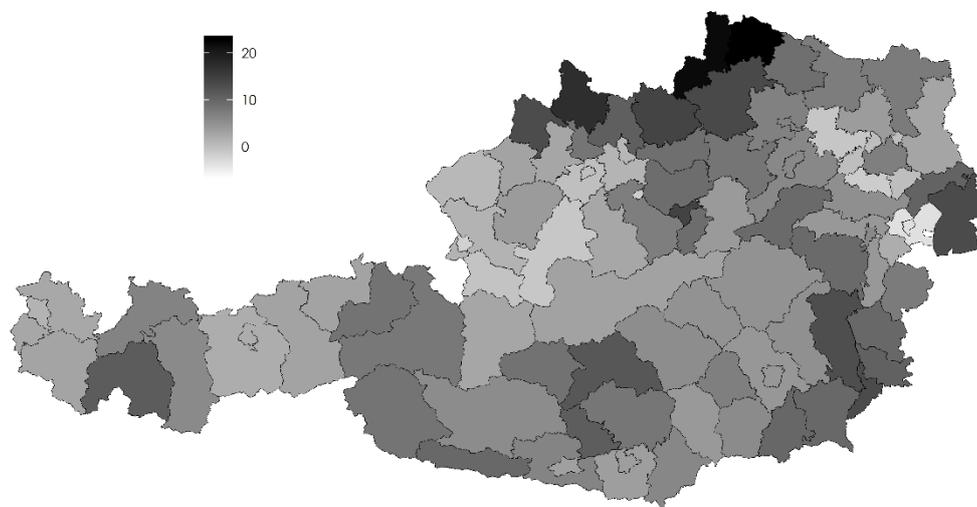
²⁷ In part this arises from immigrants' desire to reside in places close to their home (Huber, 2002) in part, however, recently such a de-concentration in the Eastern part of Austria has resulted from the sub-urbanisation of Bratislava, as persons working in Bratislava have moved to Austrian regions close to the border for purely residential reasons (see Görgl et al., 2017).

Figure 1: Differences in employment and unemployment rates of foreign and Austrian citizen by district (2016)

Unemployment Rate



Employment rate



Source: Statistik Austria, Abgestimmte Erwerbstatistik 2016.

Similarly, this data – as it is the only data source that is also representative at a small-scale regional break down – can also be used to analyse the employment and unemployment rates of the foreign-born by country of origin on a small-scale regional level. Figure 1 depicts the differences in unemployment and employment rates between natives and foreign-born in

the districts of Austria.²⁸ As can be seen from this figure unemployment rates are higher among the foreign-born than among natives and employment rates lower in almost all districts of Austria, but these differences vary substantially across regions. The highest difference in unemployment rates between natives and immigrants (of 25.6 percentage points) was found in Gmünd in 2016, while the lowest was in Eisenstadt Umgebung (3.1 percentage points). Similarly, the differences in employment rates between natives and immigrants ranged from -6.7 percentage points (in Rust) to 22.9 percentage points (in Waydhofen an der Thaya). This thus suggests very different preconditions for labour market integration of immigrants in various regions that may be triggered by differences in sector specialization, settlement structure (such as diversity and segregation) or immigrant sorting, to name only a few potential explanations. While quite a few studies have documented these differences (see Biffl et al., 2010, 2012), to the best of our knowledge this data has, however, never been systematically explored to uncover the reasons for these regional differences in integration in Austria, despite substantial interest in this topic in the international literature.²⁹

Data from migration statistics, by contrast, have been used to analyse the mobility of foreign citizens in Austria both across national borders as well as within the country (see Huber, 2002). This research regularly finds substantial churning among the migrant population in Austria. As can be seen from Figure 2, which presents the gross emigration and immigration rates as well as the migration balance (i.e., net immigration) of both Austrian and foreign citizen to and from Austria from 2001 to 2017³⁰ net immigration of foreign citizen to Austria continuously increased from the mid-2000s to 2015 and subsequently declined to 49,800 persons. Yet, even in 2015, 80,100 foreign citizens emigrated from Austria, while 198,700 immigrated. Similarly, in 2009, when the net immigration of foreign citizens to Austria was lowest (at 24,400 persons), a total of 91,700 foreign citizens immigrated to Austria and 67,200 emigrated.

Thus, the gross emigration of foreign citizens exceeded net immigration by a factor of 1.7 (in 2015) to 3.7 (in 2009) in the last two decades. The same, however, applies to Austrian citizens.³¹ While the migration balance for Austrian citizens is traditionally negative, gross emigration exceeded net emigration by a factor of more than 2.0 throughout the observation period. This stylized fact that has also been documented in earlier research (see, e.g., Münz –

²⁸ A further use of this data set that to the best of our knowledge has not yet been fully exploited is that it can be used to calculate segregation indices, as it has recently also been released on a very detailed 250x250 metres grid level.

²⁹ The literature on the regional determinants of the integration of immigrants has often focused on the role of diversity, ethnic networks and segregation in shaping immigrants' outcomes (see, e.g., Borjas, 1995; Cutler – Glaeser, 1997; Bertrand et al., 2000; Patel – Vella, 2007; Horvath – Huber, 2019).

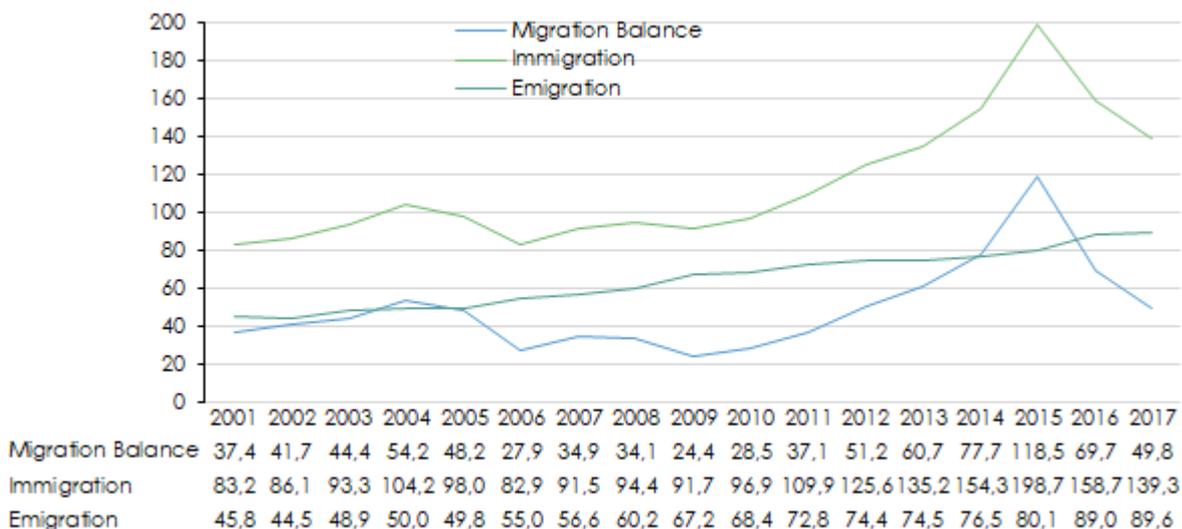
³⁰ The Austrian migration statistics commence in 1996, while prior to this only data on net migration to Austria was available. Migration statistics data from 1996 to 2000 is, however, incomparable to data from 2001 onwards due to methodological changes (see Statistik Austria, 2019 for details).

³¹ These could in principle also be naturalized foreign born persons, given that foreign born are eligible for naturalization after 10 years in Austria and that the migrations statistics define migrants according to the nationality.

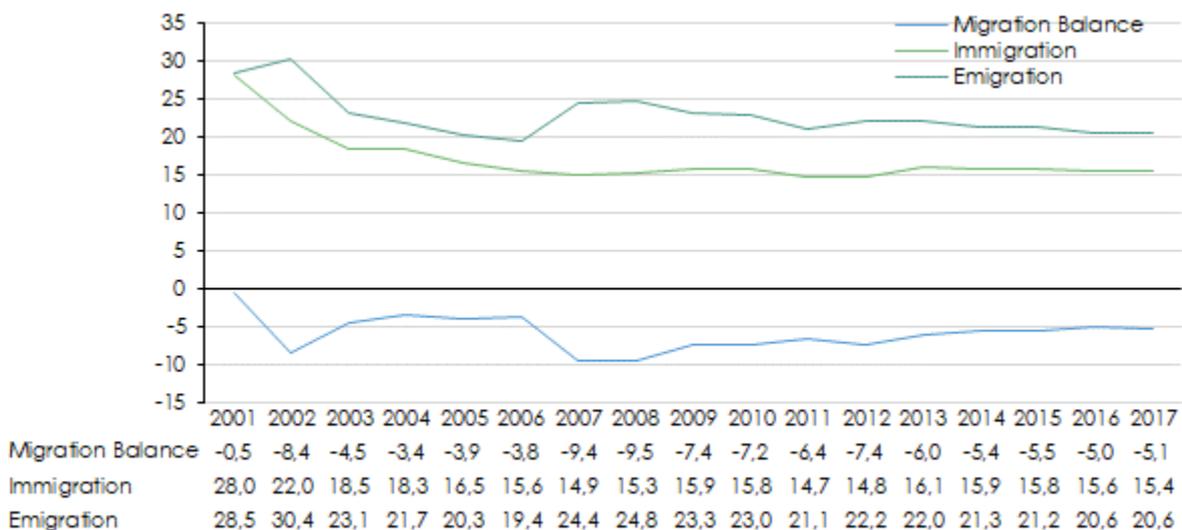
Lebhart, 1999) is indicative of the substantial circular and return migration among foreign citizens in Austria.

Figure 2: Gross immigration and emigration and migration balance in Austria (2001 – 2011, in thousand migrants)

Foreign citizen



Austrian citizen



Source: Statistik Austria, Wanderungsstatistik.

Wisbauer (2017b) further analyses the structure of the emigrants and immigrants to Austria in 2015. He finds that:

- the majority of both the immigrants (59.1%) and emigrants (58.1%) are male,

- the average age of immigrants to Austria is 40.9 years, while that of emigrants is 41.9 years,
- the age distribution of emigrants shows peaks at the ages of 20 and 25, while emigrants peak at around 27,
- a large share of the immigrants (around 36.4% of all immigrants) from abroad move to Vienna.

Furthermore, he extends on these findings by linking the migration statistics to the Austrian education register (Bildungsstandregister) to analyse the education structure of emigrating Austrian nationals aged over 15. He finds that the highest emigration rates are among university graduates (as 0.5% of these graduates emigrated between 2013 and 2015) and among persons with qualifications in the natural sciences (with an emigration rate of 0.66%). Görg et al. (2016) use this data to analyse immigration and emigration to the larger Vienna metro-region. They too document that immigrants to the Vienna region mostly arrive at the age of 20 or 25 (i.e., at the time of moving to a university education or finding a job).

Finally, both Wisbauer (2017a) and Moser (2017) show that foreign citizens in Austria are substantially more mobile even within Austria than Austrian citizens and that like Austrian citizens also foreign citizens tend to move more strongly to the suburbs.

3.2 Research based on IFA

Data from IFA (and former FIS and AIS) have been repeatedly used in Austrian migration research to monitor the structure of foreign-born. In particular, the OECD's annual SOPEMI report (see, e.g., Biffl, 2017) provides a regular chapter on the "Inflows of third-country citizens on the basis of permits" based on these data. Similarly, up to 2013 an annual report of the ministry of the interior (entitled "Zur Niederlassung von Ausländerinnen und Ausländern in Österreich" – see, e.g., Biffl – Bock Schappelwein, 2013) analysed this data in detail to discuss issues such as the expected future family reunification migration to Austria or the distribution of migration according to residence titles. Bock-Schappelwein, Bremberger, and Huber (2011) used this data set to study highly qualified workers from third countries in Austria.

Furthermore, these datasets have been of some value in validating results from other data sources. Thus, for instance two recent studies by Huber and Böhs (2016, 2017) use IFA data to validate the number of asylum seekers registered in the ASSD. According to this report, the dynamics in the number of first-time applications for compulsory health insurance as an asylum seeker reported in the ASSD reflect the dynamics in the number of asylum applications reported in the IFA quite well over the years 2005 to 2014 but the number of first asylum applications submitted is underestimated by the number of first-time applications for compulsory health insurance as an asylum seeker, with this difference amounting to around 3,000 cases in most years and significantly higher in 2009 (5,000 cases).

One potential use of this data that to the best of our knowledge has not yet been fully exploited is the question as to how different rights associated with different titles (such as the

right to move between employers or across regions) impact on integration outcomes, despite this issue being of high interest in international research (e.g., Kato – Sparber, 2013; Cobb-Clark, 2000).

3.3 Research based on the Labour Force Survey

While the above data sources have been used primarily in demographic studies the most important data set for research on immigrant integration in Austria has been the LFS. This has been repeatedly used to describe and analyse the employment and unemployment situation of foreign-born in Austria and in some of its regions (see, e.g., Biffl et al., 2010, 2012) and has also served to elicit estimates of overqualification rates among natives and foreign-born (see Bock-Schappelwein et al., 2009; Gächter, 2006). For example, in a recent study, Huber et al. (2017) use LFS data from 2014 linked to the migration ad-hoc module of the LFS to assess the differences between natives and foreign-born in terms of the Zaragoza indicators in Austria (see Table 6). Overall, the results of this study confirm that the labour market integration of foreign-born is worse than that of natives. Their participation, employment, and self-employment rates are lower and their unemployment as well as over-qualification rates are higher than among natives. In addition, foreign-born (in particular women) have a higher part-time employment share but a lower share of self-employed.

As shown in Table 6 there are, however, also important differences between individual migrant groups, which can be summarized as follows:

- The labour market integration of family migrants and immigrants for asylum reasons is worse for all indicators than for labour migrants.
- There is a lower labour market participation among educational migrants, which is, however, likely to be due to their increased participation in education.
- Migrants from Turkey and third-country non-European countries are the least well-integrated groups while immigrants from EU12 countries face particular challenges in integration in terms of overqualification.
- Persons who immigrated to Austria between the ages of 15 and 24 have a particularly low labour force participation and therefore seem to be another specific target group for integration policies.³²
- Gender differences among foreign-born (to the detriment of women) are significantly higher than among native-born.
- The higher-skilled groups show more significant deviations in terms of employment between natives and foreign-born than the low-skilled groups.

³² This thus corroborates recent results in the international literature that document the specific integration problems of immigrants migrating in this age group (Corack, 2011; Goldner – Epstein, 2014; Bock-Schappelwein et al., 2009) which are usually attributed to the specific problems documented by development psychologists as well as the many discontinuities that mark the education systems of receiving countries for this age group.

Table 6: Indicators of Immigrant Labour market integration by characteristics (differences to natives in percentage points)

	Employment rate	Participation rate	Unemployment rate	Overqualification rate	Part time employment share	Self-employment rate
Region of birth						
EU 15	1.1	2.5	1.7	0.9	1.4	0.0
EU 12	-0.2	4.7	5.8	17.1	7.0	-0.1
Former Yugoslavia ¹	-7.7	-3.5	6.0	10.9	-2.9	-5.1
Turkey	-21.2	-12.5	14.6	-0.2	-8.3	-4.7
Others	-14.5	-7.9	10.3	10.2	8.9	0.2
Reason for migration						
Work	-0.8	4.1	5.9	9.8	-7.3	-1.7
Family	-11.2	-6.9	6.6	12.1	11.2	-2.3
Education	-17.4	-14.5	5.7	10.2	14.7	-3.5
Asylum	-12.1	-4.1	11.5	15.1	-2.8	-1.9
Others	-4.9	0.2	6.7	1.3	-2.9	-2.0
Age at migration						
0 - 14 years	-5.7	0.4	8.0	-1.0	-1.8	-2.2
15 - 24 years	-11.9	-8.2	6.0	8.8	4.7	-4.1
25 - 39 years	-3.8	1.2	6.4	12.4	1.6	-1.1
40 - 64 years	-14.5	-8.4	9.6	13.9	-0.5	0.3
Recognition of qualification						
Obtained in Austria	-3.1	2.4	6.9	0.3	-1.1	-1.6
Formally recognized	0.8	3.4	3.1	8.9	-1.2	-1.9
Not formally recognized	-11.7	-6.5	7.9	13.1	3.9	-2.4
Language proficiency						
As mother tongue	-1.2	2.3	4.4	1.9	2.8	0.4
Advanced	-1.1	1.9	3.7	14.3	-0.3	-2.6
Average	-13.2	-5.4	11.4	9.2	-1.6	-3.9
Low	-28.8	-21.3	15.4	24.0	10.5	-5.2
Year of migration						
1989 - 1993	1.7	5.6	4.5	5.1	-3.6	-2.6
1994 - 2004	-4.7	0.9	7.3	5.7	4.4	-2.2
2005 - 2014	-11.2	-5.1	9.0	18.0	6.7	-2.1
Citizenship						
Austrian	-6.6	-3.5	4.6	4.0	-0.5	-0.5
Non-Austrian	-8.2	-2.5	7.9	11.7	2.7	-2.8

Source: Statistik Austria, Labour Force Survey 2014, WIFO-calculations. – Notes: Sample = working-age population (15 to 64 years) excluding persons in compulsory military and civil service. Employment rate: employment in % of the working-age population. Unemployment rate: Unemployment (according to EU / ILO definition) in % of the labour force. Participation rate = labour force (employees + unemployed) in% of the working-age population. – ¹ Including Croatia. Positive values indicate higher rates (shares) of foreign-born than natives.

Immigrants also benefit from better language skills, longer stays in Austria and recognition of their qualifications, as migrants with better language skills, longer lengths of stay and formally recognized qualifications outperform migrants with poorer language skills, shorter lengths of

stay and formally unrecognized qualifications in most labour market indicators.³³ The results for citizenship acquisition also indicate that migrants who have Austrian citizenship outperform those without. However, it is unclear whether these differences should be traced back to the acquisition of citizenship or to the longer stay of migrants with Austrian citizenship.

Results from LFS data also indicate that the presence of a migrant background is in general associated with lower education levels and poorer integration into the education system although the results vary considerably between groups of people: while young people whose parents were born in the EU show even higher education levels than those whose parents were born in Austria, having a non-EU migration background is associated with markedly lower education levels (Stadler – Wiedenhofer-Galik, 2012). While age at migration may affect schooling outcomes, also second-generation migrants show much lower education levels and higher early school-leaving rates than natives. While early school-leaving rates are somewhat lower and education levels higher compared to first generation migrants, these findings indicate that educational integration strongly depend on parents' education and migration background.

There are also striking differences in the educational structure depending on the German language skill of the immigrants and their recognition of qualifications. In particular, people with a good knowledge of German and recognised qualifications are on average better educated, more often female, and tend to be slightly older than people with low language skills or non-recognised qualifications (Huber et al., 2017). Moreover, immigrants who came to Austria at a young age also tend to be less well educated.

3.4 Research based on the EU-SILC and SHARE Data

The EU-SILC and Share datasets, by contrast, have been much less used in integration research in Austria. Halmdienst et al. (2013) are an exception that uses SHARE data to assess the social integration and health outcomes for older immigrants in Austria. They show that the immigrant population aged 50 and above in Austria:

1. Is less often active in voluntary organizations, cohabitates with a partner substantially less often and thus also has less contact with family members than natives of a similar age, but has larger networks of friends.
2. Has lower educational attainment levels and socio-economic status on average, but (in particular when male) more often work above the minimum retirement age (of 65) and thus has higher employment as well as unemployment rates than natives of the same age.

³³ These benefits diminish significantly when one controls for the differences in the socio-demographic structure of migrants with recognized qualifications and good language skills. This is a sign of considerable self-selection, through which migrants, who benefit most from recognized qualifications and good language skills also invest most in the formal recognition of their qualifications and language acquisition.

3. Reports a worse health status, a substantially larger number of diagnosed physical illnesses, and more often suffers from symptoms of depression than natives of the same age.
4. Visits general practitioners about as often as natives but spends more time in hospital.
5. Has an increased need for support that seems to be more related to socio-cultural and language needs rather than traditional care for the elderly.

Furthermore, this study also shows substantial differences between immigrants based on country of origin. In particular immigrants from former Yugoslavia and Turkey are generally the most disadvantaged in all respects. The authors suggest that the identified disadvantages are in part explained by differences in the demographic composition of the migrant groups but are also associated with factors such as low income and socio-economic status.

The EU-SILC, by contrast, has mostly been used in EU-wide studies focusing on the benefits and costs of immigrants to the welfare state (e.g., Boeri, 2010; Brücker et al., 2002). In this literature, Huber and Oberdabernig (2013) show that immigrants in Austria receive fewer contributory but more non-contributory benefits than natives, but that these differences can to a large degree be explained by the differences in characteristics between foreign-born and natives (such as their age, education, and household size).

3.5 Research based on ASSD

Besides the (E)LFS, the ASSD has been the other central source of insights on the integration of foreign-born in Austria. Thus, several studies (see, e.g., Biffl – Skrivanek, 2011) use this data as an alternative source to measure immigrants labour market integration and to focus on smaller subgroups in more detail. These studies usually document substantially higher unemployment rates among immigrants as well as their lower employment rates and wages. Furthermore, these data have also been used to show the segregation of the Austrian labour market (see, e.g., Huber, 2001a).

In addition, some recent studies (e.g., Huber – Böhs, 2016, 2017, Bock-Schappelwein et al., 2009) have used the panel structure of this data to consider the progress of specific immigrant groups in the Austrian labour market over time. Bock-Schappelwein et al. (2009) focus on cross-border commuters to the Burgenland covered by the bilateral agreement between Austria and Hungary that existed between 1998 and 2011. This study shows that Hungarian cross-border commuters had a higher employment probability, a longer duration of employment and higher wages than other Hungarian workers who came to the Austrian labour market in the same years under other entitlements. The authors argue that this points to the success of the agreement in attracting workers who were in demand and accordingly had good chances of success in Burgenland's labour market. Moreover, these commuters were also characterized by lower sectoral and regional mobility than Hungarian workers who came to the Austrian labour market in the same years under other entitlements. This – according to the authors – also reflects the better labour market integration of cross-border commuters

Huber and Böhs (2016, 2017), by contrast, focus on the labour market integration of refugees and beneficiaries of subsidiary protection, who arrived in Austria in the years 2005 to 2015. A look at various indicators of labour market integration shows a rather differentiated picture for these groups. In particular, these asylum seekers:

- Initially, have very low employment and participation and high unemployment probabilities relative to natives and the overall foreign-born.
- Quickly catch up with other foreigners as their stay prolongs. Ten years after entry the number of days these refugees spent in the labour force as well as in employment and unemployment was comparable to other foreigners.³⁴
- Do, however, not fully catch up relative to natives in terms of employment and unemployment rates, but approach natives in terms of labour supply. Even ten years after labour market entry the employment rate of this group was still substantially lower (and the unemployment rate substantially higher) than among nationals. The participation rate, by contrast, approaches natives much more closely and even overtakes native values in some instances.
- Do not experience further improvements in terms of days spent in employment and unemployment after the first four years after entry for later entry cohorts than 2005, which may be a sign of a change in the composition of this group or (alternatively) a result of the crisis of 2009.
- Have not caught up in terms of wage levels. This may in part be due to the continued entry into the labour market of groups that have lower earning potentials.

Furthermore, Kanduth (2019) uses this data to examine the effects of demographic characteristics and variables which can be influenced by economic policy on the employment and unemployment probabilities of persons granted asylum in the years 2005 to 2014. The main results of her estimations show that employment during the asylum procedure and a shortening of the asylum procedure have positive effects on the labour market integration of refugees. Early training, primarily provided for low qualified refugees, by contrast, is mainly associated with increased participation, but reduced employment and higher unemployment.

Vogtenhuber et al. (2016), by contrast, analyse trends in the employment prospects of refugees entering the Austrian labour market between 2001 and 2016. They show that changes in the composition of source countries have led to a lower average labour force participation of women among recent refugee cohorts. In part, this explains the employment gap among recent cohorts. Educational attainment levels, however, do not explain much of the employment gaps across cohorts, while they are closely related to source country labour force participation patterns. Females akin to western gender role attitudes have much better

³⁴ These results are in line with a number of international studies which show that recognized refugees have poorer labour market integration at the beginning of their stay but catch up faster than other foreigners during the first years of their stay (see Bock-Schappelwein – Huber, 2016, for a review).

employment prospects. Similarly, employment among refugee cohorts is closely tied to the existence of co-ethnic communities while the economic conditions at labour market entry matter less. In particular, the growth and the share of asylum seekers among foreign nationalities in Austria are negatively related to finding a job quickly. Finally, the models estimated in this contribution leave part of the employment gaps across cohorts unexplained. The authors argue that this is due to the number of refugees who entered the labour market at the same time. Although these numbers seem to be rather low in comparison to all employees, employment opportunities in this segment seem to be very limited as well.

Recently some studies also link ASSD and PES data to other data sources in innovative ways to obtain additional information on immigrant integration. In this literature, Hofer et al. (2017) have used the ASSD combined with information from the Labour Force Survey to analyse wage discrimination against immigrants in Austria. They find that immigrants experience a wage disadvantage of 15 percentage points compared to natives. A substantial part of the wage gap can, however, be explained by differences in human capital endowment and job position. Decomposition methods using quantile regressions show larger discrimination in the upper part of the wage distribution. Moreover, these authors also do not find any evidence for the wage assimilation of immigrants in Austria.

Rengs et al. (2017), by contrast, use self-collected data on the qualifications of refugees that arrived in 2015 and data from official qualification tests in the PES to PES data on vacancies to show that the labour supply provided by refugees roughly corresponds to the labour demand in Austria.

3.6 Research using register and survey-based education data

Educational data are frequently processed and cited in diverse reports on the Austrian school system. The national education report (Oberwimmer et al., 2019) for example, regularly compiles available educational statistics and thereby also offers a comprehensive overview of the integration of immigrants into the Austrian education system. These reports document the fact that migrants in general less integrated into the formal education system but with considerable variation between migrant groups.

While age at migration may affect outcomes (Huber et al., 2017) students' colloquial language – which may be seen as an indicator for German language proficiency – is clearly associated with education outcomes. Students with non-German colloquial language show higher drop outs and are less likely to enter the high education track. While second generation migrants seemingly catch up in terms of education outcomes, they still have e.g. higher rates of early school leaving compared to those without migration background (Stadler – Wiedenhofer-Galik, 2012). Besides the education of the parents, the cultural and economic capital of the family, the migration background of the child and whether German is the first language of the student are also more or less strongly related to the acquisition of competencies on an individual level (Neubacher et al., 2019).

3.7 Research based on AES and REV

Due to the large number of personal characteristics, AES data offer the possibility for detailed analyses of the Austrian population. By combining the AES with longitudinal data from social security and unemployment records, REV adds a longitudinal component that is especially suitable for the analysis of employment careers. Jestl et al. (2019) analyse employment patterns of immigrants in Austria using register-based employment career data (REV) distinguishing non-European refugees from other migrants. The REV allows them to follow their labour market integration pattern (i.e. their employment probability in relation to their time spent in Austria) and compare them to natives and other immigrants and at the same time control for individual characteristics such as education level, the number of children and the age of the youngest child. Thereby they are able to exploit the strength of the data stemming from the combination of longitudinal information and a rich set of personnel characteristics.

Their analysis shows that initial refugee employment gaps are large in the first years, but these gaps narrow over time. After four years the employment gap has declined from above 80 to 50 percentage points and after seven years it amounts to 30 percentage points. Controlling for differences in individual characteristics between natives and immigrant groups reduces the employment gaps for all immigrant groups.

Also based on REV data, Marik-Lebeck and Kytir (2017) carry out a cohort analysis of the employment histories of newly arriving immigrants in the years 2010 to 2012. They illustrate that only about half of the newcomers remain in Austria for more than five years. Within the first five years, labour force participation is catching up with the level of the respective citizenship group, but faster for EU citizens than for third-country nationals, and faster for men than for women.

4. Conclusions

Overall our survey shows that a wide range of data exist that may be used to assess different aspects of immigrants' integration. At the same time these data sets vary widely in the groups of immigrant population considered and the measurement concepts implemented.

Among the data sets focusing on labour market integration covered in this survey the ASSD used to be the only individual-level panel data set allowing for an analysis of the integration of all immigrants (and migrant workers as commuters) over a long period of time but at the same time lacking reliable information on some core variables (such as the highest level of education). By contrast, the LFS provides an extensive list of both outcome variables and a fair amount of individual-level controls to assess the integration of immigrants but contains only limited longitudinal information. By establishing the REV data based on different administrative register data, the large data gap resulting from the fragmentation of information between different data sets has been closed partially by combining detailed cross-sectional information with a longitudinal labour market career on an individual level.

Except for the 2014 ad-hoc module of the LFS (and PIAAC), none of the data sets considered here provides an indication of the language proficiency of immigrants, which has been considered one of the most important determinants of success at integration among immigrants in most of the international literature. This lack of language proficiency information, given the importance of this variable for immigrant integration, questions the reliability of many of the insights gained by research on the labour market integration in Austria.

Despite the complex data situation previous research has, however, been able to provide a number of important stylized facts and insights on the integration of immigrants in the Austrian labour market. These include the substantial differences between settled natives and foreign-born in terms of all labour market and educational indicators as well as the apparent lack of catching-up in terms of wages. In particular, we would argue that the most interesting among these studies are those which mix different data sets (such as the merged population statistics and tax data analysed by Moser (2017) or the merged LFS and the ASSD analysed by Hofer et al. (2017) or use combined register data such as the REV directly.

Research on the integration of different groups of immigrants into the labour market and education system can be expanded in Austria. The increasing heterogeneity of the immigrant groups underlines the importance of targeted research whose findings can contribute to labour market integration and integration into the education system.

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